Equipoise Consulting, Inc.

Energy Analysis

Project Management

Training

Final Report for

Local Energy Efficiency Program No. 148-02 Energy Solutions' 2002/03 LightWash Program

Prepared by:

Equipoise Consulting Incorporated

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1 EXECUTIVE SUMMARY

The LightWash Program offered rebates on the installation of energy and water efficient cloths washers in coin operated laundromats and multi family housing in collaboration with water utilities that generally covered the Pacific Gas and Electric (PG&E), Southern California Gas (SoCalGas) and San Diego Gas and Electric (SDG&E) service territories. These programs were often offered in conjunction with local water utilities. In addition the LightWash program offered turn key installation of energy efficient lighting in the PG&E service territory at coin operated laundromats and businesses adjacent to participating laundromats. The lighting installations were incented up to a maximum cost effectiveness limit, which in some cases allowed complete coverage for the project.

This evaluation had the following elements: (1) development of program theory, (2) assessment of program per-unit impact calculations, (3) assessment of the program database, including quarterly assessment of data population and progress toward marketing goals, (4) an energy impact assessment based on verification of units installed and deemed per-unit impacts, and (5) and assessment of program market impacts.

1.1 Energy Impact Assessment Findings

The LightWash program exceeded the net energy and demand savings goals set out by the program, delivering the following results:

	kW	kWh	Therms
Total Program Net Impacts	623	3,933,094	450,076
Total Program Net Impact Goals	594	3,687,743	394,598
Program Net Realization Rate	105%	107%	114%

1.2 Market Impact Assessment Findings

The conclusions for the washer and lighting market impact analyses are presented below by program element. In doing so it provides an overall picture of the program effect on the market indicators.

Washing Machine Component. The findings from the efficient washer component market impact assessment are:

1. The Program successfully raised participating customers and route operators awareness of the benefits of high efficiency clothes washers through their Program literature. Distributors stated they were already very aware of the benefits.
2. Those who see the information believe the potential savings indicated in the Program literature. In addition, customers seem to place more value on water savings than energy savings.

3. The installation of high efficiency clothes washers appears to be due more to the rebate than simply the belief in the provided information.
4. The Program has a positive impact on participating customers current attitudes towards energy efficiency.
5. The likelihood of installation of high efficiency clothes washers in the future appears to be more a function of possible rebate levels than acceptance of the information provided.
6. While the reduction in the water bill was most noticeable to customers, some customers also reported noticeable reductions in electric and gas bills.
7. There seemed to be little attempt at renegotiation of the route operator contracts. However, the few times renegotiation was requested, it resulted in changes in contract terms.

Seen together, these conclusions paint a picture of a washer program component that positively affects customer awareness and attitudes, but of an installation environment that is still dependent on rebates to make many installations occur.

Lighting Component. The findings from the lighting component market impact assessment are:

1. The program is well marketed and successfully addressed the target market. It appears to pull in small retail stores.
2. The washer component of the Program created synergy with lighting installations.
3. The Program appears to cause energy efficient lighting installations that would not otherwise have occurred.
4. Most customers who looked at their bill closely enough to observe a change saw a small or medium size reduction in their electric bills after installation of energy efficient lighting.
5. Customers who saw a reduction in their bills state they are more likely to install energy efficient lighting sometime in the future when a similar monetary incentive is available. However, when the incentive is half the current amount or absent there is no difference in stated potential future actions between those who saw a reduction in their bills and those who did not.
6. The program improved customers' attitudes towards energy efficiency in general, at least in terms of their stated attitudes.

Overall, the lighting component succeeded in affecting the market actors it set out to influence. It appears to have achieved installation of lighting in markets that otherwise would not have installed efficient lighting. While the program has influenced the attitudes of participants concerning energy efficiency, it appears that those participants still require incentives to make future installations. (It should be noted that it was never the goal of the program to transform this market.)

1.3 Overall Findings

The LightWash program was found to be well run and successful. It exceeded the program target impact goals, ran a solidly documented program, marketed the program well, and affected the market actors it set out to influence.

The obvious success of the program and the need in the market call for the continuation of this program.

Recommendations for minor program and evaluation improvements are made in Section 6.

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2 INTRODUCTION

2.1 Program Overview

The LightWash Program was a collaboration with the California Urban Water Conservation Council (Council)—a partnership of 284 California water agencies and organizations concerned with water supply and conservation of natural resources in California--and numerous California water and wastewater agencies.

The Program operated in the service territories of the following participating water agencies including:

Alameda County Water District

Contra Costa Water District

City of Cotati

City of Davis

East Bay Municipal Utility District

City of Manteca

Marin Municipal Water District

Metropolitan Water District of Southern California

City of Millbrae

North Marin Water District

City of Redwood City

San Diego County Water Authority

San Francisco Public Utilities Commission

Santa Clara Valley Water District

Santa Cruz Water Department

City of Santa Rosa

Soquel Creek Water District

U.C. Davis

Valley of the Moon Water District

Water Resource Association of San Benito County

Through these partnerships, the LightWash Program provided prescriptive rebates and targeted outreach and marketing to encourage the adoption of high efficiency clothes washer technology by laundromats, businesses, and institutional and multi-family common area laundry facilities. For laundromats, which are often "Very Small Nonresidential" hard-to-reach customers, the program also offered turnkey lighting retrofit services within the PG&E service territory.

The Program design provided for a coordinating infrastructure for processing incentive applications and deploying marketing and targeted trade ally and customer outreach. By consolidating resource-intensive activities, such as incentive processing and targeted outreach, the LightWash Program attempted to remove substantial cost and staff resource barriers, thereby facilitating the active involvement of additional water agencies.

In addition to incentive funding, many water agencies contributed to marketing efforts and education through their standard channels, including bill inserts, newsletters, etc. The LightWash Program also leveraged the national Consortium for Energy Efficiency's (CEE) Commercial, Family-Sized Washer Initiative framework, including their performance specification list and qualifying products list.

The lack of on-site staff puts laundromats into an especially-hard-to-reach category. Thus the program addressed this market segment more comprehensively, offering a turnkey lighting retrofit program in the PG&E service territory. The lighting program was marketed by trade allies (who also did installations), through the local chapters of the Coin Laundry Association, trade show presentations, direct mail, and advertisements and articles placed in industry journals.

Experienced, small commercial lighting contractors conducted audits and provided retrofit design recommendations. The customer paid only a portion of the lighting retrofit with incentives paid to contractors covering the difference. The program relied on a select group of experienced lighting contractors that had agreed to specified program protocols and fixed measure pricing. The lighting retrofit program removed the laundromat owner/manager from the difficulties associated with technical decisions, vendor screening, quality control, and other worries and time commitments. In addition to the laundromats, the program was allowed to offer the lighting retrofits to businesses in the same complex as the participating laundromat.

2.2 Evaluation Objectives

Energy Solutions' core evaluation objectives were to have the EM&V contractor perform:

- Independent inspections of appropriate samples of the sites that received program services,
- Verification of the number of units of each measure type that were installed,
- Identification of appropriate sources for per unit deemed savings for each measure,
- Estimation of the peak kW and annual kWh and Therm savings accrued by the program,
- Reporting of the results of the study,
- Assessment of the Program tracking database (to assure that it was properly implemented and is correctly tracking ex ante estimates of Program savings),
- Verification of the achievement of the Program unit-based marketing activities., and
- Assess program theory and progress toward affecting near term and intermediate term indicators.

In addition to these "core" requirements, the California Public Utilities Commission (CPUC) has stipulated eight overall objectives that must be addressed by the evaluation. The Administrative Law Judge (ALJ) stipulated items summarized and discussed below.

2.3 Stipulated Items

The ALJ issued a ruling on November 27, 2002 requiring all evaluations to address a set of eight overall objectives stated in the CPUC Energy Efficiency Policy Manual (EEPM)[1]. The eight objectives are listed below along with a description of how each was addressed by this evaluation.

1. Measuring level of energy and peak demand savings achieved. – *Equipoise used IPMVP Option A to measure the peak demand and energy impact of the program as detailed in the write up in Section 4. The IPMVP allows considerable latitude in the specification of deemed savings. Equipoise's approach minimized evaluation cost by specifying the delta energy and kW values as deemed, and measuring the units installed.*
2. Measuring cost-effectiveness (except information-only) – *The evaluation supplied Energy Solutions with ex post estimates of energy and demand savings. Energy Solutions calculated cost effectiveness.*
3. Providing up-front market assessments and baseline analysis, especially for new programs. – *A market assessment and baseline analysis was not done as a part of this evaluation. The current Statewide Residential Tracking study conducted by Itron assessed the market and baseline for the clothes washer measures addressed by this Program. The lighting baseline was taken from the California Statewide Commercial Sector Energy Efficiency Potential Study.*
4. Providing ongoing feedback and corrective and constructive guidance regarding the implementation of programs. – *This evaluation performed quarterly reviews of the program implementation. These reviews assessed the progress of program unit implementation activities and memos were timed for inclusion in Energy Solutions required quarterly reports.*
5. Measuring indicators of the effectiveness of specific programs, including testing of the assumptions that underlie the program theory and approach. –*Equipoise assessed program theory, identified indicators of effectiveness, and assessed baseline levels for program effectiveness indicators through a series of interviews with various market actors. The program theory was used to identify the market actors to be interviewed.*
6. Assessing the overall levels of performance and success of programs. *The evaluation assessed the extent to which the Program achieved its stated objectives through the quarterly assessments of program progress.*
7. Informing decisions regarding compensation and final payments. – *The evaluation supplied assessments of the Energy Solutions progress toward implementation goals on a quarterly basis. In the fourth quarter assessment, an assessment of final implementation levels compared these results to overall program targets.*

[1] California Public Utilities Commission. (2001) "*Energy Efficiency Policy Manual.*" Prepared by the Energy Division of the California Public Utilities Commission.

8. Helping to assess whether there is a continuing need for the program. –*Equipoise used the energy and demand savings values, along with the program theory and its assessment, to draw conclusions about the probable ongoing need for the program.*

2.4 Report Contents

The remainder of this report is divided into the following sections

Section 3, Data Sources, presents the sources for all data used in the evaluation, both existing and new data collection.

Section 4, Study Method, which provides the details of the methods used to fulfill the objectives and stipulated items presented in Sections 2.1 and 2.3 above.

Section 5, Results, goes through the results of the study objective-by-objective.

Section 6, Findings and Recommendations, summarizes the key findings extracted from Section 5, and forms recommendations for improving future LightWash programs and evaluations of those programs.

Appendices:

A. References

B. Engineering Review of LightWash Algorithms Used For Deemed Savings

C. Quarterly Verification Reviews

D. Final Data Collection Instruments

E. Participant Survey Response Statistics

F. Washer Route Operator Interview Responses

G. Washer Distributor Interview Responses

H. On-site Inspection Deviation Records

3 DATA SOURCES

This section delineates the data sources used to complete this study. The data sources are discussed by the primary evaluation application. When the data source is also used for subsequent purposes it is listed but not described.

3.1 Existing Data/Sources

3.1.1 Per Unit Impacts, Impact Assessment and Database Verification

The existing data source available for evaluation purposes included:

- The LightWash ex ante algorithms,
- Program databases containing number of units installed by the LightWash Program,
- Trade Ally contact information,
- Industry contacts available from Energy Solutions program design efforts.

Extensive secondary data sources were available to support the evaluation. Some of the data sources were:

- Manufacturers data,
- Prior studies on washers, and
- CEC database.

Per Unit Impact Values and Overall Program Impact - As stated previously, the approach stipulates the change in (delta) kWh, therm, and peak kW values resulting from the installation the lighting and washing machines prompted by the program. The stipulated values used in the savings estimates came from the data developed by the extensive evaluations conducted in the state of California over the past 10 years and from the California Energy Commission (CEC) databases. The specific prior studies and databases use to verify the delta kWh, therm, and peak kW values are provided in Appendix A.

3.1.2 Database Verification

Verification of Number of Units Installed, Tracking Database Structure, and Marketing Achievements. The primary data sources used to verify the number of units installed, assess the tracking database structure, and monitor marketing achievements was the program database and program paper files.

The program database allowed review of the structure and content to assess database validity. It allowed quarterly reviews of program marketing progress and paper verification of the numbers of measures installed. In addition, the program database offered a source for the lists of participants and contact information in the LightWash Program that was needed to conduct participant surveys and trade ally data collection.

During each quarterly review, a sample of paper files for 10 projects (assuming 10 had been completed) was requested for review and comparison to the electronic data. The sample size of 10 was designed to achieve a projected precision of 80% confidence, plus or minus 20% for the program overall.

3.2 Evaluation Data Collection and Sampling Plan

This section presents the data collection efforts designed to collect the additional data needed to complete the evaluation. The discussion details the sample design for these data collection efforts.

3.2.1 Independent Onsite Verification of Installation

Equipoise conducted independent onsite verification to confirm that the measures claimed by the LightWash program had actually been installed and were of the type and specifications stated in the program database. The key words here are "independent onsite verifications". Energy Solutions and its agents, as part of their program implementation, conducted post-installation inspections of all lighting jobs and a random sample of 5% to 10% of washing machine sites. In addition, PG&E, the contracting agency, conducted inspections of a sample of LightWash sites. The role of the evaluator is to independently verify that the installed equipment is as claimed.

Sample Design: The sample for the onsite inspections was in proportion to participation for each service territory and was randomly drawn to ensure that it was representative over the applicable service territory (i.e., PG&E for lighting, all three utilities for washers). Equipoise staff visited 67 lighting sites and 57 washer sites during the course of the evaluation. These sample sizes were established during the planning stage to ensure precision of 90% confidence plus or minus 10% for the final results, based on the projected sample frames. In addition, the original design assumed a 25% overlap of washer sites with lighting sites, resulting in a total of 110 on-site visits. All sites that had already been inspected by PG&E were not included in the sample.

When it came time to do the actual field inspections, there were fewer lighting sites (119 sites) than originally projected and a very small overlap between lighting and washer sites (7 sites). In consultation with the LightWash project manager, Equipoise decided to go ahead and complete the inspections of 67 lighting sites and 57 washer sites, and just accept the increased confidence level implied.

Timing of Verification Inspections: The installation verification onsite inspections occurred in February and March of 2004, with follow up work in April. This timing allowed sampling of all applications completed prior to January 31, 2004.

3.2.2 Trade Ally Interviews

Overall, the evaluators interviewed 161 market actors in order to assess the effect of the program on near and medium term indicators of market effects. The data collection was distributed amongst market actors as shown in Exhibit 3.1.

Part of the assessment of near-term and medium-term indicators of program market effects included interviews with trade allies. Program staff accumulated names and contact information of lighting installers, washing machine distributors, and laundry route operators that were used for designing samples and conducting distributor and route operator interviews. Since one lighting contractor installed the vast majority of the lighting, it was determined that interviews with lighting contractors were unlikely to produce useful information, so none were conducted. For the washer component, LighWash staff had accumulated names and contact information for 11 route operators and 24 distributors that had participated in the program to some degree. In order to accumulate enough responses to analyze, even qualitatively, a census of all washer distributors and route operators was conducted. Thus no sample design was required for this effort. Exhibit 3.1 shows that interviews were completed with 8 route operators and 11 distributors.

Exhibit 3.1
Market Actor Data Collection

Market Actor Description	Component	Popul-ation*	Planned	Actual Achieved
Route Operators	Washers	11	5	8
Distributors	Washers	24	12	11
Account Owners	Washers	505	70	70
Coin-Op. Laundromat Owners	Lighting	47	31	29
Adjacent Business Participants	Lighting	72	45	43
Total	-	659	163	161

* Participating trade allies from lists supplied by LightWash staff. Participant lists extracted from LightWash database.

3.2.3 Program Participant Surveys

As another part of the effort to assess the affect of the program on near and medium term indicators of market effects, the evaluation team conducted telephone surveys of program participants.

The telephone survey effort completed 70 surveys of washer participants out of a sample frame of 505. The 70 washing machine account owner surveys were stratified between coin-operated Laundromats and multi-family facilities in order to get a representative cross section of washer program element participants. In addition, the data collection was managed to collect data from each service territory in proportion to participation. Also, during this exercise, the evaluation team attempted to collect self-report information on the number of wash cycles per day (turns per day) for the installed machines. (While this information is documented in this report, it was never intended that it should be used to modify the program impact estimates.)

The lighting element program participant surveys were separated into two groups, the actual coin operated Laundromat owners and the owners of adjacent businesses (under the terms of the program, LightWash was allowed to solicit businesses in the same complex as participating Laundromats for inclusion in the program). No territorial distribution was necessary since the lighting component was only offered in the PG&E service area. A census was performed on each group.

3.2.4 Data Collection Instruments

To the degree feasible, all market actors interviewed (trade allies and participants) were asked a standard set of questions designed to measure the near and possible medium term indicators of program success. In addition, the washer program element instrument attempted to collect self-report information on the number of "turns per day" (wash cycles per day per machine) for each site. The final data collection instruments for each market segment, separated by market actor, are presented in Appendix D.

4 STUDY METHOD

This section presents the specifics of the data assessment approach, data collection approach, and method that were used to complete the project. The project was straightforward and involves three types of evaluation efforts.

4.1 Develop Program Theory and Identify and Assess Success Indicators

This effort addressed the CPUC objective of "Measuring indicators of the effectiveness of specific programs, including testing of the assumptions that underlie the program theory and approach."

To develop and document the program theory, Equipoise met with and interviewed LightWash program staff. The meetings and discussions focused on program priorities, expected program accomplishments, issues facing the program and information needs. Presented below is a sample of the kinds of questions that guided the interactions in the meetings.

- What is the program trying to accomplish and what resources does it have?
- What results have been produced to date?
- What accomplishments are likely in the next year?
- Why would the program produce those results?
- What are the program's main problems?
- What kinds of information do you get on the program's performance and results?
- What kinds of information do you need?
- How do you (how would you) use this information?
- What are your objectives for this program?
- What are the major activities?
- Why will those activities achieve those objectives?
- What is the program staffing?
- Who does the program interact with, and for what purpose?
- What is the program total budget?
- What evidence is necessary to determine whether objectives are met?
- What happens if the objectives are met? Not met?
- What data or records are maintained?
- What services delivered?
- What service quality is being targeted?
- What outcomes are sought?
- What and how often is data collected?
- How is this information used?
- Does anything change based on these data or records?

On the basis of the information from the meetings and interviews, Equipoise produced program theory and implementation theory models, along with associated lists describing each causal and

communication link in the diagrams, for each element of the program. These theory models identified the resources employed by the program, intended program activities, expected program outcomes, and assumed causal linkages. The causal/communication linkages essentially described the proximate program performance indicators that needed to be assessed by the evaluation.

In addition, Equipoise used the program and implementation theory descriptions to identify the which market actors needed to be interviewed as part of the effort to assess the near and possible medium term indicators of program success.

4.2 Assessment of Ex Ante Calculations and Progress Toward Marketing Goals

This effort had three distinct elements: 1) an overall assessment of the program tracking system, 2) an independent review of the ex ante energy savings calculations, and 3) quarterly reviews of the progress toward achieving program marketing goals.

4.2.1 Overall Assessment of the Program Tracking System

As part of the first quarterly evaluation of the LightWash data, Equipoise staff obtained all relevant program database tables and reviewed their structure, use and content. Equipoise requested clarification on the use and population of various fields, and on two separate occasions met with LightWash staff responsible for the database to discuss overall structure and to clarify details. The review included understanding the use for each variable, assessing the degree to which each variable was populated, and making recommendations to LightWash on potential areas of need and concerns about levels of data population. The review of the levels of database variable population continued during each quarterly review discussed in Section 4.2.3.

4.2.2 Independent Review of Ex Ante Energy Savings Calculations

The evaluation Team reviewed the input parameters, algorithms, and program tracking database used to compute and track the gross program energy and demand savings. Equipoise used its engineering expertise in assessment of program measures, along with external data sources, to validate the algorithms and input parameters, and to recommend and document changes or adjustments to more accurately reflect the recorded savings. Further, the database was assessed to be sure that it correctly calculated the savings estimates and correctly accumulated savings for program progress tracking.

4.2.3 Quarterly Review of Activities Toward Marketing Goals

Equipoise conducted quarterly assessments of the program tracking database to monitor progress toward marketing goals. At the end of each quarter Equipoise requested the measures paid during that quarter. All records in that quarters project-specific (for washers) or customer-project-specific (for lighting) tables were provided a random value. The records in these main tables that fell into the sample frame as determined by the finite population correction value were

verified. For tables linked to the main table, only those projects or customer-projects that were linked to records selected in the main table sample were verified.

For the sampled records, Equipoise assessed the total number of cells within each table that contained data, provided a subjective indicator of the importance of the data for both program and evaluation purposes, and subjective comments on the data populating the cells for each variable. An importance level of one (1) was used to indicates that correct population of these cells is key to either evaluating the project or to documenting the program impacts. An importance level of two (2) indicates that these cells could be key to evaluating or documenting the program, but that it is impossible to tell based on the population of the database whether the cells in the database should be populated. An importance level of three (3) indicated a variable considered to be irrelevant for evaluating the program or documenting the program impacts.

Once the electronic verification of the data was completed, ten projects or customer-project records from the sampled group were randomly selected for visual verification of hardcopy data. The hardcopy data that was visually verified was the copy of the application with the customer signature and a copy of the check cut to the participant. By conducting quarterly assessments the evaluation team assured that the database was being adequately populated to support program savings and progress reporting. As issues were identified they were then be corrected in a timely manner.

In approximately January of 2004, Equipoise staff physically reviewed and copied all promotional literature and promotional articles and publications developed by the program prior to that data. These documents form a physical record of program promotional efforts.

4.3 Ex Post Computation of Savings

One of the primary goals of the LightWash evaluation was to develop an ex post estimate of program savings. To accomplish this goal Equipoise applied an evaluation method that is compliant with the International Performance Monitoring and Verification Protocols (IPMVP) Option A.

The approach used onsite field data collection to verify lighting and washing machine installation to achieve a precision of 90% plus or minus 10%. The ultimate precision exceeded 95%, plus or minus 5%, on the impact value. The approach stipulates the delta kWh, therm, and peak kW values for the lighting and washing machines installed. This calculation methodology can be presented mathematically as shown in Exhibit 4.1.

Exhibit 4.1
Impact Calculation

Impact = [N * RR] * U Where:

N = Number installed per the program database

RR = Realization rate from onsite audits

U = Stipulated impact from literature

The stipulated values used in the savings estimates came from the data developed by the extensive evaluations conducted in the state of California over the past 10 years and from the California Energy Commission (CEC). The types of lighting installed as part of the Program have been assessed in many studies, sectors, and utility service territories and did not warrant further study during this evaluation. The per-unit savings due to the installation of energy efficient washing machines have been assessed and documented by the CEC and can be stipulated for this study. Thus this study used measured unit counts and stipulated energy and demand unit values. This approach presents the best cost-benefit value for this program, and the Research Plan stating this approach was agreed by the CPUC Energy Division staff.

In addition, as agreed in the Research Plan, this evaluation only developed gross impact estimates. A deemed net-to-gross ratio of 0.96 was used to calculate the net energy impacts of the program. This net-to-gross ratio, from the Energy Efficiency Policy Manual V2 Table 4.2, was based on the Express Efficiency (rebates) program area.

5 RESULTS

This results section is organized according to the evaluation goals. Since there are redundancies between the Energy Solutions goals and the CPUC Stipulated Items, Equipoise presents below a combined set of overall evaluation goals. The evaluation goals listed below restate the overall Energy Solutions evaluation goals from Section 2, add CPUC Stipulated Item 4 (again from Section 2, and the only Stipulated Item that is (1) not overlapping with the LightWash goals or (2) not applicable to this evaluation), then rearranges the objectives in an order conducive to the results presentation.

1. Providing ongoing feedback and corrective and constructive guidance regarding the implementation of programs:
    - Assessment of the Program tracking database (to assure that it was properly implemented and is correctly tracking ex ante estimates of Program savings),
    - Verification of the achievement of the Program unit-based marketing activities,
    - Verification of the number of units of each measure type that were installed.
2. Energy and Demand Impacts:
    - Identification of appropriate sources for per-unit deemed savings for each measure,
    - Independent inspections of appropriate samples of the sites that received program services,
    - Estimation of the peak kW and annual kWh and Therm savings accrued by the program.
3. Assess program theory and progress toward affecting near term and intermediate term indicators.
    - Program Theory (Presented by program Segment: Lighting and Washers)
    - Measures of Near and Medium Term Market Effects (Presented by program Segment: Lighting and Washers)

Thus, the following sections present the results in the order presented above.

5.1 Ongoing Feedback and Constructive Guidance

This section summarizes efforts by the Equipoise Team to assess the program database, verify marketing activities, and verify the units installed by measure type, as the program progressed.

5.1.1 Assessment of Program Database

The primary assessment of the LightWash database took place during the first quarterly data verification. In order to understand what was in the database and whether that information would be useful to the program and the evaluation, Equipoise reviewed all primary tables.

Overall the database was found to be a sound tool for tracking performance and operation of key project functions. It accumulated the information needed to track progress toward goals and to allow final computation of program savings estimates, both by the program and the evaluation team.

The only significant flaw in the program database was that the washer component and lighting component of the program had completely separate databases. This resulted from the necessary expedient of getting the two components up and running at the beginning of the program. While the two databases did contain a field to identify whether the participant in one component was also a participant in the other component, these fields were not populated with meaningful data, and thus did not allow cross-referencing of participation. This resulted in additional work during the evaluation merging the two databases and attempting to cross reference records based on address or customer name. In addition, this lack of linking limits the program's ability to automatically identify opportunities opened by one program component for the other

Another program database issue arose toward the end of the evaluation concerning the tracking trade ally information. While the database recorded route operators as trade allies where applicable, it did not contain information beyond the name of the company. Trade ally information appeared nowhere in the database, primarily because there is no program action that would cause entry of the distributor information. Trade ally information was comprehensively tracked in an Excel file that included the trade allies' mailing address, phone number and email, brands carried, and type and date of contact with program. This file included all trade allies that regularly received mailings and/or phone calls from program staff in order to provide program updates. The evaluation team was able to obtain this contact information for distributors and route operators from program staff, but since some of the route operators and all of the distributors were not connected to projects, it was often unclear whether these contacts' customers had actually participated in the program. A separate query in the program's Access database was required to obtain a list of trade allies whose customers participated in the program.

Better tracking of trade ally information would benefit the program evaluation effort. For distributors, this could possibly be done through the application process. LightWash would need to assess the balance between the potential benefits of this avenue and the potential downside of making the application process burdensome for the customer. If it is considered too burdensome, more systematic record keeping by program staff could fulfill the need.

The on-going quarterly assessments assured the evaluation team that the database was continuing to be populated and that progress was being made toward marketing goals.

5.1.2 Verification of Program Unit-based Marketing Activities

The true assessment of the effectiveness of the program marketing activities is progress toward achieving program targets. Through the quarterly database assessment, Equipoise documented program progress toward commitment. Exhibit 5.1 presents a summary of the installation progress documented by the four quarterly reports conducted during 2003. These results do not represent the final accomplishments of the project, since a quarterly report was not completed for the first quarter of 2004. This was because the program was extended and the evaluation budget did not include funding for an assessment in this period. The results show that the washer component of the program had just about reached their goals by the end of 2003. The lighting component did not have a project goal (the primary lighting goal was a kW reduction goal), but the results show that 130 project installations had been completed by the end of 2003.

Exhibit 5.1
Progress Toward Program Goals

	Q1	Q2	Q3	Q4	Total to End 2003	Target
Machines Installed	1081	1073	1603	1826	5583	5872
Projects	9	44	42	35	130	*

*Overall goal was 278.3 kW, which did not directly translate to projects.

The marketing activities that lead to the achievement of these unit-based goals were reported by LightWash in the quarterly reports, and are summarized below in Exhibit 5.2 for the entire program.

Exhibit 5.2
Marketing Activities by Type through End of Program

Description	Number
Program Materials	9
Direct Mail	4
Water Utility bill stuffers/letters	6
Articles	9
Advertisements	5
Press Releases/Newspaper articles	12
Presentations and distribution of materials at events	15
Attendance and distribution of materials at events	11
Web site references	9
Total number of activities/events	**80**

In addition to the tracking of progress over time, and reporting the overall marketing effort, in January of 2004 Equipoise physically reviewed all hard copy marketing material developed by the program to that point. Exhibit 5.3 presents the results of this review by marketing activity

type through the end of 2003 (Note: categories were developed by the evaluation team at the time of review and do not directly correlate to the categories presented in Exhibit 5.2).

Exhibit 5.3
Reviewed Hard Copy Marketing Materials by Type through End 2003

Hard Copy Description	Number
Fact sheets and handouts for customers	3
Magazine articles on LightWash program	6
Direct mailers by trade allies	9
News letters with articles on LightWash by trade allies	9
News paper articles on LightWash	5
Presentation on LightWash program	1
Press releases by trade allies on LightWash program	3
Web site references to LightWash program by trade allies	4
Total Hard Copy Marketing Material Reviewed	**40**

Overall Exhibit 5.1 through Exhibit 5.3 illustrate a sound marketing campaign that achieved the unit based targets.

5.1.3 Verification of Units Installed by Measure Type

Equipoise verified that the units installed were of the type and quantity claimed by conducting field inspections. In the case of the washers, model numbers were verified at each washer installation. As discussed in Section 3.2.1, the sample design assured a precision above 90% confidence plus or minus 10% for the final results. The results of theses inspections are presented in Section 5.2.2.

5.2 Energy Impacts

This section covers the estimated energy and demand impacts from the installation of energy efficient lighting at coin operated laundromats and adjacent sites in the PG&E service territory and high efficiency commercial clothes washers throughout all four investor-owned service territories. The method used to calculate the impacts is as indicated in Section 4.

5.2.1 Review of Deemed Savings Estimates

Clothes Washers – The assumptions used in the calculation of energy impacts per turn (i.e. per use of the clothes washer) were found to be sound, if not a bit conservative. The overall program deemed savings value was a function of the assumed number of washers installed by location type and the assumed number of turns per day of those washers. For example, multi-

family common area clothes washers assumed three to four turns per day while laundromat washers assumed six turns per day. The evaluation team used the actual number of units installed in each type of location in conjunction with the per-unit impact value shown in Exhibit 5.4 to calculate the impacts of the washers.

Exhibit 5.4
Turns per Day by Location of Washer

Location Type	Turns per Day	Therm Impact	kW Impact	kWh Impact
Businesses and washers in multi-unit facilities with 9 or fewer units per site.	3	45.6	0.058	233
Washers in multi-unit facilities with greater than 10 units per site.	4	60.8	0.058	311
Laundromats and institutional sites.	6	98.8	0.058	505

The values shown in Exhibit 5.4 were calculated using the same information as the program deemed savings and included energy impacts from upstream pumping discussed next.

The deemed savings value used by the Program did not include potential energy impacts due to the reduction in the amount of water passing through supply pumps and wastewater pumps at the system level. Equipoise researched this issue and determined that there are savings to the grid seen by the decreased water use pumping load. Equipoise calculated a kWh/gallon value for pumping using data from *Water Energy Use in California* (2003). However, the best information on this issue was provided by Shadid Chaudhry of the California Energy Commission (CEC). He provided a document that showed the pumping energy use in Exhibit 5.5. (Carns, 2001) The values calculated from these two sources were similar in magnitude, with the Carns values being smaller. [2]

Another source of information was the *Energy-Aware Planning Guide* (CEC, 1993). This document indicated that energy use fell by up to 20% if the amount of wastewater was reduced by 50%. (The savings were due to lower pumping requirements.) Because this indicated a non-linear relationship between the wastewater pumping in the wastewater treatment plant and the water going through the plant, a 40% reduction in the energy use for pumping in the wastewater treatment plant was applied as shown in Exhibit 5.5.

The energy use for the upstream and downstream pumping could be applied to the gallons of water saved by the clothes washer. Inclusion of this value increased the per machine annual electrical savings by 12%; there would be no influence on the therm savings. It is acknowledged that this impact would be virtually impossible to verify with any precision and was simply accepted based on the Carns and CEC reference along with engineering estimates.

[2] The "*Water*" document references calculated a value of 0.00317 kWh/gallon while Carns provided a value of 0.00235 kWh/gallon.

Exhibit 5.5
Energy Use for Pumping

Pumping Activity	kWh / Million Gallons	Percent of energy use used in analysis
Raw water pumping	350	100
Pumping in the distribution system	1,150	100
Pumping to the wastewater treatment plant	150	100
Energy use in the wastewater treatment plant	1,050	40
Total impact from clothes washers	**2,070**	**-**

The LightWash peak demand impact value of 0.058 kW per unit was taken from the CEC peak reduction value (Table 13B from CEC 2001). This value appears reasonable based on the kWh impact for a single use of the washer (0.190 kWh per turn), assumptions regarding length of time the washer is run in an hour (40 minutes), and number of washers in use during the CPUC peak period of noon to 7 PM (45%). The peak demand impact value was not varied by market sector in the impact analysis as there was no information to reasonably adjust the run time during peak periods for each market sector.

The therm savings per unit are based on the electric savings for water heating and reduction in dryer use. The savings are then converted from electricity to natural gas. The conversion calculation takes into account the percent of natural gas dryers[3] and natural gas water heaters[4] found in the California. The assumptions that went into the determination of therm savings per washer are viewed as reasonable and were used to calculate the impacts for the program.

Lighting – There was no actual evaluation of the assumptions used for the connected load reductions as these impacts are based on PG&E values (Pacific Gas and Electric, 2000) with a few connected load reductions based on specific calculations. It is tacitly assumed that since PG&E has been conducting lighting evaluations since 1992 that the evaluation corrections have been incorporated into these program values. The multipliers (i.e., the coincident diversity factor, deemed hours, interactive kW demand effects[5], and interactive kWh energy effects) were double checked against the values in the PG&E workpapers. There was one very minor discrepancy that was brought to the attention of Energy Solutions (there was a 0.03 difference

[3] *Statewide Survey of Multi-Family Common Area/Building Owners Market.* Final Report, Volume 1. June 2000. Page 5-5.

[4] IBID, Page 5-10.

[5] The term "interactive effect" refers to the savings in air-conditioning load due to the reduction in the amount of heat emitted by the lighting into the air-conditioned space when more efficient lighting is installed.

between the demand interactive effects with the deemed value shown to be 1.16 while the PG&E value was 1.19). As detailed in the Program Implementation Plan (PIP), Energy Solutions planned to apply interactive effects only to areas with "significant air conditioning". Upon completion of the program LightWash had 7 sites with areas indicated to have "significant air conditioning" loads. These projects saw increased kW and energy impacts of 11 and 16 percent respectively, depending on the site. Equipoise agrees with how the interactive effects are currently applied.

Each of the connected load reduction values were checked against the PG&E values with only one very slight difference found. (A 1 watt per lamp impact difference between the PG&E value and the information in the deemed savings value for a fixture that had not been installed through the program at the time of the review.) Additionally, it was pointed out to Energy Solutions that four of the values in the PG&E connected load reductions were per fixture, not per lamp. As the fixtures to which these values applied had no installations at the time of the review, it made no difference to any impacts. Energy Solutions planned to correct this value in the database so any future estimates would be correct. In addition, the review identified two fixture types not included in the PG&E values that were found to have questionable connected load reductions (Premium 4 foot T8 with Electronic Ballast from 8 foot HO T12 with Energy Saving Ballast and Premium 4 foot T8 with HO Electronic Ballast from 8 foot HO T12 with Energy Saving Ballast). These were pointed out to Energy Solutions and were updated in the database. .

The program calculates the ex ante demand impacts using the connected loads and a coincident diversity factor. To calculate ex ante energy impacts, each kW calculated from the actual lights installed is divided by the coincident diversity factor for laundromats (as this is not included in energy) and then multiplied by the laundromat hours of operation value. The final ex ante kWh impact is calculated as shown in Equation 1 and Equation 2 below.

$$\text{kWh Impact} = \frac{5{,}840\ (\text{Laundromat Hours})}{0.88\ (\text{Laundromat CDF})} * \text{kW Impact} \quad (1)$$

$$\text{kWh Impact} = 6{,}636\ \text{Hours} * \text{kW Impact} \quad (2)$$

However, while the kWh impact as calculated in Equation 2 will be the value indicated in the quarterly reports, it will not be the final ex post kWh impact for the program. The following is an excerpt from an email from Energy Solutions to PG&E:

> "Internally, we plan to use generally accepted, but lower numbers for lighting projects done on "adjacent businesses" because such lower numbers are more realistic. However, I think we are going to have to report it to you in the workbook on the basis of laundromat hours because that is all we filed and that is what is wired into the workbook now. We can't keep modulating the number each month when there is a different weighted average hours of use assumption in the workbook because it would mess up the historical calculations. Thus, our external reporting will show lighting savings based on only one approved hours of use assumption, and will be slightly over what we really believe they are. I

don't think it will amount to much…" (excerpt from 6/10/03 email to Laura Mann of PG&E)

The evaluation team used the hours of operation by business type as shown in Exhibit 5.6 to obtain the final ex post kWh values for the lighting component of LightWash.

Exhibit 5.6
Lighting Hours of Operation and Coincident Diversity Factor by Market Sector

Market Sector	Deemed Operating Hours	Coincident Diversity Factor
Laundromat	5,840	0.88
Office	4,000	0.81
Restaurant	4,600	0.68
Retail	4,450	0.88
School	2,150	0.42
Warehouse	3,550	0.84

The structure of the database and the queries used to calculate program savings based on the connected loads were reviewed with no discrepancies found.

5.2.2 Independent Onsite Inspection

Equipoise inspected lighting and clothes washer sites to determine if the expected measures were installed.

Lighting - At lighting sites, the inspections consisted of comparing the type and number of fixtures expected, based on the LightWash database, to what was found at the site. There were 43 unique measures inspected during these onsite audits, the majority of which were T8 fixtures with various numbers of lamp or ballasts. The audits found virtually all the T8 fixtures expected, but substantially fewer CFLs. Appendix H has the complete listing of expected and found measures by unique type. The ratio of expected to found were applied by unique measure type to all lighting data in the database. There were 18 measures that were not covered during the onsite audits. The evaluation team used engineering judgment to place each of these measures into one of the audited "bins" and used that specific audited bin ratio. The mapping of non-audited measures to audited measures and resulting ratios is also located in Appendix H.

Exhibit 5.7
Expected and Found Lighting Fixtures

Measure	Expected	Found	Difference	Ratio
T8	1135	1130	-5	99.6%
CFL	103	70	-33	68.0%
LED	13	13	0	100.0%

The audits showed that CFLs were replaced by incandescent bulbs or simply removed at the site. When queried, many of the participants did not know why or when the bulbs had been removed. When knowledgeable staff were available, the most common reason for removal or replacement with incandescent bulbs was that the unit had failed.

Washers – Because the per-unit impacts varied by market sector, the ratio of expected to found washers was calculated by market sector. The ratio was applied to each washer site in the database based on the specified market sector.

Exhibit 5.8
Expected and Found Clothes Washers

Market Sector	Expected	Found	Ratio
Business (not laundry)	4	4	100%
Institutional	4	4	100%
Laundromat	139	143	103%
Multifamily	292	290	99%

The audits indicated that laundromats had installed slightly more energy efficiency washers than for which they obtained rebates (all washer model numbers were checked at a site to assure that each machine was considered energy efficient). While this was puzzling, conversations at one of the sites who had knowledgeable personnel indicated that there were a subset of washers present at the site that were not owned by the business, although they were changed at the same time. Therefore, the business did not obtain rebates for these machines. Because there were more washers found than expected at two randomly chosen sites, this phenomena was considered to have occurred throughout the population and the found ratios were applied for the impact estimation.

5.2.3 Program Energy and Demand Impacts

Using the methods described in Section 4 and the per-unit impacts as detailed above, the gross impacts of the program are shown in Exhibit 5.8.

Exhibit 5.9
Gross Program Impacts

End Use	Market Segement	N Sites	Ex Ante				Ex Post				Gross Realization Rate			
			N Washers or Fixtures	kW	kWh	Therm	N Washers or Fixtures	kW	kWh	Therm	N Washers or Fixtures	kW	kWh	Therm
Washers	Laundromat	194	2,479	144	842,860	173,530	2,550	148	1,287,750	251,940	1.03	1.03	1.53	1.45
	Multi-Family	733	3,268	190	1,111,120	228,760	3,246	188	888,607	173,797	0.99	0.99	0.80	0.76
	Other	65	455	26	154,700	31,850	455	26	220,255	43,092	1.00	1.00	1.42	1.35
Total Washers		992	6,202	360	2,108,680	434,140	6,251	363	2,396,612	468,829	1.01	1.01	1.14	1.08
Lighting	Laundromat	103	3,977	136	904,164	-	3,957	136	902,768	-	1.00	1.00	1.00	-
	Retail	82	3,862	126.1	836,555	-	3,806	123.8	625,622	-	0.99	0.98	0.75	-
	Other	29	1,244	32	213,114	-	1,188	30	193,798	-	0.96	0.93	0.91	-
Total Lighting		214	9,083	294	1,953,833	-	8,952	290	1,722,187	-	0.99	0.99	0.88	-
Total Program Gross Impacts				654	4,062,513	434,140		653	4,118,799	468,829	-	1.00	1.01	1.08

The deemed net-to-gross ratio (NTGR) of 0.96 (based on the rebate-type program NTGR from the Efficiency Policy Manual) was applied to the gross impacts to provide the net program impacts shown in Exhibit 5.10.

Exhibit 5.10
Net Program Impacts

End Use	Market Segement	Ex Ante			Ex Post			Net Realization Rate		
		kW	kWh	Therm	kW	kWh	Therm	kW	kWh	Therm
Washers	Laundromat	138	809,146	166,589	142	1,236,240	241,862	1.03	1.53	1.45
	Multi-Family	182	1,066,675	219,610	181	853,063	166,845	0.99	0.80	0.76
	Other	25	148,512	30,576	25	211,445	41,368	1.00	1.42	1.35
Total Washers		345	2,024,333	416,774	348	2,300,748	450,076	1.01	1.14	1.08
Lighting	Laundromat	131	867,997	-	131	866,657	-	1.00	1.00	-
	Retail	121	803,093	-	119	600,597	-	0.98	0.75	-
	Other	31	204,590	-	29	186,046	-	0.93	0.91	-
Total Lighting		283	1,875,680	-	278	1,653,300	-	0.99	0.88	-
Total Program Net Impacts		628	3,900,013	416,774	627	3,954,047	450,076	1.00	1.01	1.08
Total Program Goals for Net Impacts		*594*	*3,687,743*	*394,598*	*594*	*3,687,743*	*394,598*			
Program Achievement of Net Goals		106%	106%	106%	105%	107%	114%			

Washer Realization Rate Reconciliation: The same per unit kW impact value was used for the ex ante and ex post calculations, therefore the only difference is the number of washers between the ex ante and ex post. (The kW realization rate is identical to the realization rate from the number of washers.) However, for the kWh and therm impacts, the evaluation team used the per unit impacts outlined in Exhibit 5.4, while the ex ante impact values were 340 kWh and 70 therms per washer. The realization rates reflect the fact that the ex post per unit impact values were higher for laundromats and institution and lower for multi-unit facilities.

Lighting Realization Rate Reconciliation: As shown in Exhibit 5.9 (under gross realization rates, N Washers or Fixtures), 99% of all fixtures indicated to be installed under the program were found by the evaluation team. The "Other" market segment had a higher proportion of CFL fixtures installed than the laundromat and retail segments (not broken-out in exhibits), but as shown in Exhibit 5.7 CFLs had the lowest ratio of found to expected (68%). This combination generated the lowest realization rate for both number of fixtures (0.96) and kW (0.93) for this end use. For energy, the ex ante impact was calculated by multiplying the kW impact by 6,636.4 hours (see an explanation for the hours value on page 23). However, the ex post calculation used the values shown in Exhibit 5.6 by market segment. As the operating hours for the Retail and Other market segments were lower than the operating hours for the Laundromat segment, the ex post kWh impact was lower than the ex ante estimate, causing relatively lower realization rates for these market sectors.

5.3 Program Theory and Market Indicators

5.3.1 Program and Implementation Theory

This section summarizes the program and implementation theory developed for the washer and lighting components of the LightWash program. It then goes on to define the added data collection that evolved from these theory-based products. While the LightWash program was presented as a single program, in reality the two marketing and installation efforts proceeded separately. Where possible the two program elements were intended to use the synergy of the common program to promote each other's efforts.

Weiss (1998) stresses that understanding the underlying theory of the program is essential to developing the most appropriate evaluation, and that a good evaluation is based on defining, testing, and analyzing the assumptions of the program theory. In general, the theory consists of activities and the hypothesized direct and indirect communication and the causal linkages between these activities and the key market actor actions. There are many different areas in which programs can go astray, but by using the program theory to guide the program assessment, evaluators can assure a focused and relevant evaluation.

There are two types of theories used in program evaluation: 1) program theory, and 2) implementation theory.

The *program theory* model seeks to illuminate *why* the program activities are expected to lead to the achievement of immediate, intermediate, and long-term outcomes (i.e., the underlying mechanisms). For example, LightWash assumes that customers lack objective and unbiased

information on the benefits of energy and water efficient washers and efficient lighting, and that once they have that information, these small businesses lack the capital resources to go ahead with the installations without assistance. LightWash hypothesizes that given both information and capital resource assistance, the customers will make the logical choice and agree to proceed with the installation of the energy efficient equipment. Further, as a result of participation, bill savings will change participants' long term attitudes toward future energy efficient projects.

The *implementation theory* depicts the basic mechanics of fielding the program consisting of a sequence of activities that begin with program outreach and end with the adoption of recommended measures and practices, and the reduction of kWh and kW. Implementation theory tells the evaluator how the program is supposed to operate in the field.

These two types of theory were used to study the design and operation of the washer and lighting elements of the LightWash program. Since there were two program elements, the evaluation Team developed a program theory diagram and an implementation theory diagram for each element. In addition, the links between each step in the theory diagrams were numbered and descriptions developed for each link to document the process that was occurring at that stage. The theory diagrams and the link descriptions supply a complete picture of the program and implementation theory from start to finish. Once the theory diagrams were completed and agreed between the evaluation team and LightWash program staff, they were used to identify the groups (and ultimately the individuals) who should be interviewed to assess near- and medium-term indicator changes. As described above, they guided the evaluation effort.

The washer element will be discussed first, followed by the lighting element.

5.3.1.1 Program Theory for the Washers Program Component.

Exhibit 5.11 and Exhibit 5.12 present the program theory diagram and program theory linkage descriptions for the LightWash washer program element, respectively. While these two exhibits are self-evident, the following comments can be helpful.

As described above, this diagram depicts the theory about how the LightWash washer element affects the actions of the market actors. In reviewing the diagram it is useful to realize that in moving from the left (initial program formation and information dissemination) to the right (long term changes in customer practices), the diagram is moving from near-term, to medium-term, to long term effects of the program on the market actors. In addition, the diagram shows the parallel path of the LightWash lighting component, identifying the possible synergy between the program components.

As initially conceived, LightWash program staff believed the washer component to be solely an incentive program. Discussions with LightWash program staff identified probable market transformation effects resulting from (1) the increase in awareness of energy efficiency, and (2) the probable positive affects of the initial energy efficient washer installations on building owner utility bills.

5.3.1.2 Implementation Theory for the Washers Program Component.

Exhibit 5.13 and Exhibit 5.14 present the Implementation theory diagram and the linkage descriptions for the implementation theory for the LightWash washer program element, respectively.

While these exhibits are pretty self explanatory, two aspects of the program and exhibit are worth explaining. First, the program is offered in many different forms, depending on the arrangements that can be made with the water district. Sometimes the water district fields the entire program, with little attention drawn to the fact that LightWash is a participant. Sometimes, the reverse is true, with LightWash fielding the program with little assistance or participation by the water utility. And sometimes it is a joint venture with varying degrees of participation by each program entity. Second, "Route Operators" play a major role in marketing the program to a large portion of participants. Program staff estimate that 40% of the common area laundry rooms are operated by route operators that lease the space from the building operators, install the machines, then pay the building owner a percentage of the coin box collections as an incentive for the building owner and to compensate for utility costs. The installation of energy/water efficient washing machines can precipitate a renegotiation of the contract that defines the lease/coin box split.

Exhibit 5.11
Program Theory for Washer Component of LightWash Program

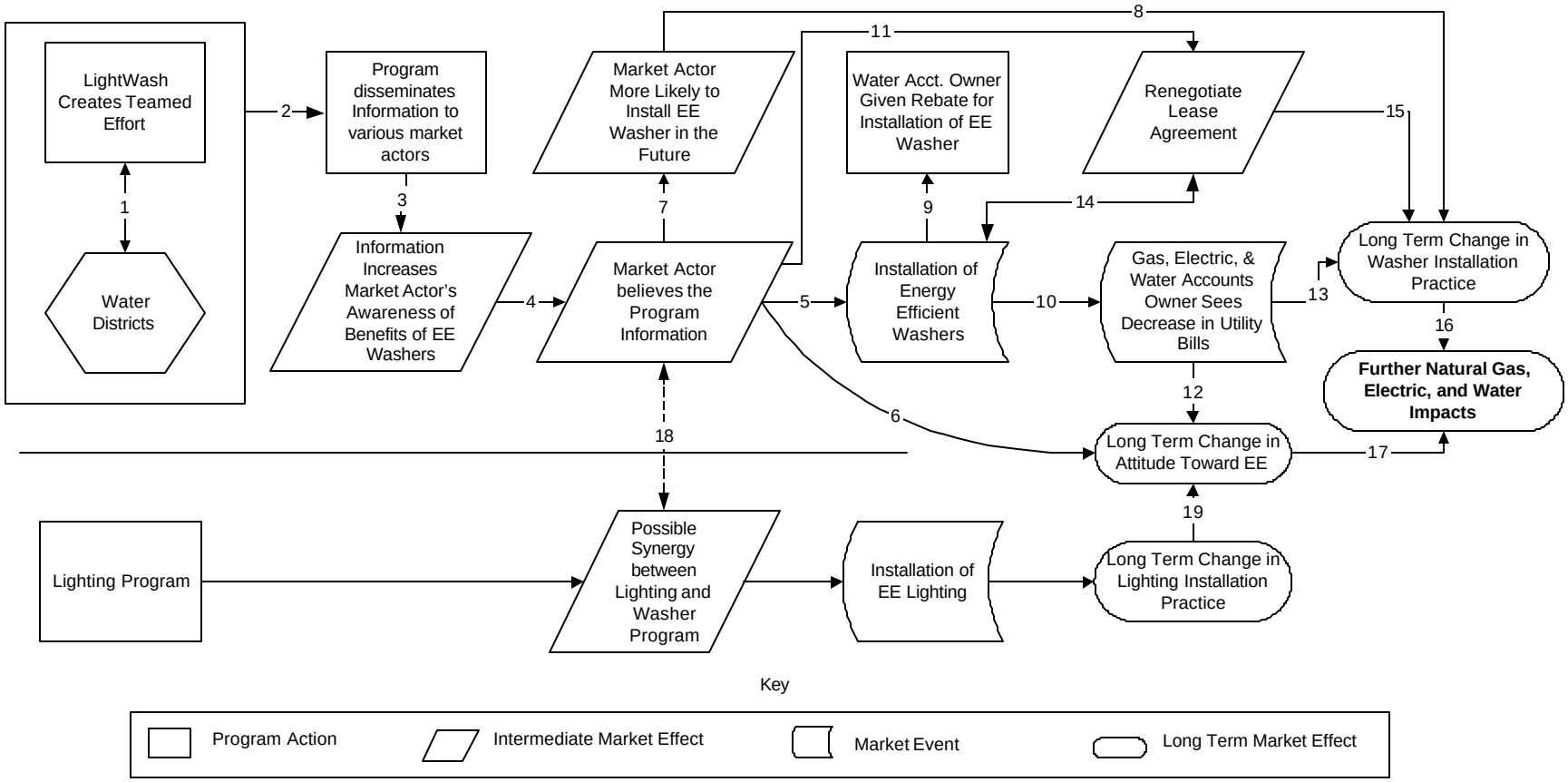


Exhibit 5.12
Program Theory Linkage Descriptions for the Washer Component of the LightWash Program

Linkage	Causal/Communication Link Description
1	LightWash establishes relationship with water district to develop information on the rebate and the utility benefits of the program: Sometimes as a completely integrated water district rebate with little moderate LightWash brand exposure included; sometimes as a completely integrated Energy rebate that promotes the water program; sometimes as separate programs, promoted separately. All depends on how the water district wants to cooperate.
2	Either the water district or LightWash offers information on the rebate and the utility benefits of the program to Market Actors: Sometimes as a completely integrated water district rebate with little moderate LightWash brand exposure included; sometimes as a completely integrated Energy rebate that promotes the water program; sometimes as separate programs, promoted separately. All depends on how willing the water district is to cooperate.
3	The information and rebate offer raise the awareness of the route operators, distributors, and customers about the operational, financial, water and energy benefits of energy efficient washers.
4	Increased awareness of EE benefits of washers leads to Market Actor belief that the information is true.
5	The belief that the information is true causes the Market Actor to install, or cause the installation of energy efficient/water efficient washers.
6	The belief that the information is true has a long-term effect on the Market Actor's attitude toward energy efficiency in general.
7	Even if the Market Actor does not install an energy efficient washer under the program, acceptance that the information is true increases the likelihood that the Market actor will install an energy efficient washer at some point in the future.
8	The increased likelihood that the Market Actor will install an energy efficient washer in the future leads to long-term change in the installation practices for commercial washers.
9	The installation of the energy efficient washer, leads to the program issuing a rebate to the water account owner.
10	Building owner receives lower water, gas, and electricity bills due to improved machine efficiency.
11, 14	In the case of route operators, the installation of energy efficient washers logically leads to renegotiation of the typical contract terms

Linkage	Causal/Communication Link Description
	between the building owner and the route operator in order to compensate the route operator for the higher cost of the energy efficient washers, and to pass on some of the savings that the building owner sees due to the lower utility bills.
12	Experience with efficient washers causes a change in the building owner's long-term attitude toward energy efficiency in general.
13	Building owner recognizes business/financial advantage of installing energy/water efficient washers and changes practice leading to the installation of more or additional machines in other locations.
14	See link 11.
15	Route operator recognizes business/financial advantage of installing energy/water efficient washers and changes practice to incorporate their installation in other locations.
16	Long-term changes in washer installation practices lead to further reductions in water, gas and electric usage.
17	Long-term changes in attitudes about energy efficiency lead to other changes that produce reductions in water, gas and/or electric usage.
18	Synergistic effects of lighting program encourage the owner to consider installation of energy/water efficient washers.
19	Long term changes in lighting installation practices contribute to changes in attitudes toward energy efficiency in general.

Exhibit 5.13
Program Implementation Theory for Washer Component of LightWash Program

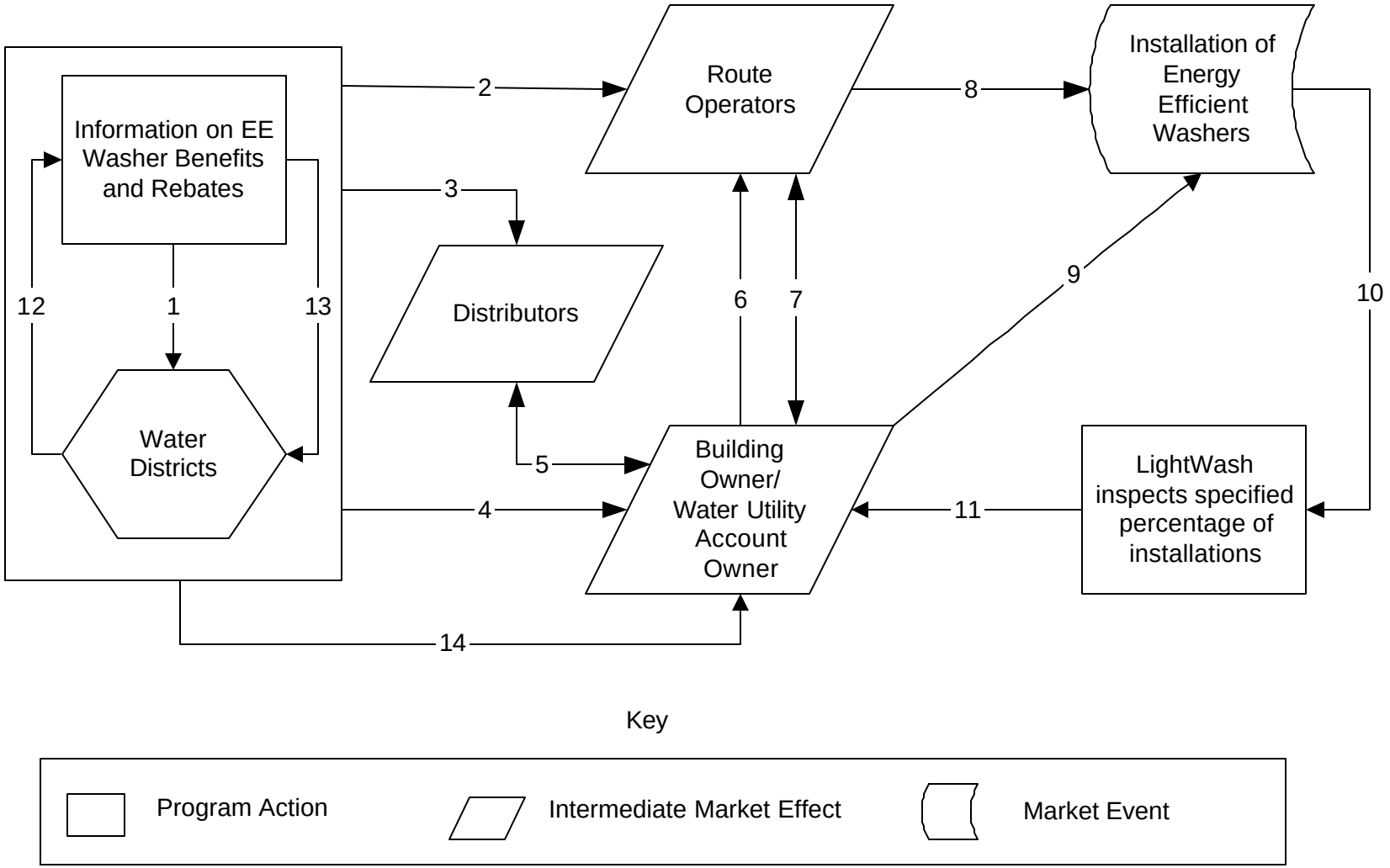


Exhibit 5.14
Program Implementation Theory Linkage Descriptions for Washer Component of LightWash Program

Linkage	Causal/Communication Link Description
1	LightWash teams with water utilities to offer a combined rebate in attempt to increase motivation of customer.
2	Either the water district or LightWash offers information on the benefits of the program and on the combined rebate to route operators: The emphasis of the information presented is on how the program can be used to better work with the building operators that they lease space from. Sometimes as a completely integrated water district rebate with little indication that the energy rebate is included; sometimes as a completely integrated Energy rebate that promotes the water program; sometimes as separate programs, promoted separately. All depends on how the water district wishes to cooperate with LightWash.
3	Either the water district or LightWash offer information on the benefits of the program and on the combined rebate to equipment distributors: Sometimes as a completely integrated water district rebate with little indication that the energy rebate is included; sometimes as a completely integrated Energy rebate that promotes the water program; sometimes as separate programs, promoted separately. All depends on how the water district wishes to cooperate with LightWash.
4	Either the water district or LightWash offers information on the benefits of the program and on the combined rebate to building operators: The message is targeted specifically to the benefits that the building owner will see, reduced water, electric, and gas bills.
5	Either distributor makes the customer aware of the advantages of the rebate in purchasing machines or the customer, already aware and convinced, goes to the distributor and requests purchase of the machines via the rebates.
6	Aware and convinced, owners affect the route operator's decision on whether or not to install energy/water efficient washing machines. Building owner who recognizes the utility savings from water and energy efficient washers have a vested interest in the installation of energy and water efficient machines.
7	Route operators, who will pay an increased cost for the energy efficient machines even after the incentive, negotiate a new contract with building owner to cover cost of machine. This offers the opportunity for route operator to develop a better long-term arrangement.
8	In the case where the route operators lease the space from the building owner, route operator decides to install an energy/water efficient washing machine because of program.

Linkage	Causal/Communication Link Description
9	Where the building owner operates the laundry facility, building owner decides to install an energy/water efficient washing machine because of program.
10	Building owner applies for rebate to LightWash or to the water utility, whichever applies.
11	For the areas where LightWash is dealing directly with the customers, LightWash inspects a certain percentage of the installations and pays the rebate to the building owner.
12	For programs run by the water districts, in which LightWash plays a passive role, the water district inspects an agreed percentage (varies between districts), and reports results to LightWash.
13	LightWash pays rebates to water district.
14	Water district pays rebate for water and energy to building owner.

5.3.1.3 Program Theory for the Lighting Program Component.

Exhibit 5.15 and Exhibit 5.16 present the program theory diagram and program theory linkage descriptions for the LightWash lighting program element, respectively. While these two exhibits are self-evident, the following comments can be helpful.

As described above, the program theory diagram depicts the theory about how the LightWash lighting element effects the actions of the market actors. In reviewing the diagram it is useful to realize that in moving from the left (initial program formation and information dissemination) to the right (long term changes in customer practices), the diagram is moving from near-term, to medium-term, to long-term effects of the program on the market actors. In addition, the diagram shows the parallel path of the LightWash washer component, identifying the possible synergy between the program components.

By design, the LightWash lighting component was a direct installation program, since this program element supplies and installs all recommended lighting at low or no cost to the laundromat owner. For owner occupied buildings, the program covered up to 75% of the installation cost, with the amount being determined by a cost effectiveness limit. Renter were eligible for a maximum of 100% of the installed cost for eligible retrofits up to a cost effectiveness limit. Initially program staff felt that there would be virtually no market effects. Discussions with LightWash program staff at the beginning of the evaluation identified probable market transformation effects resulting from (1) the increase in awareness of energy efficiency, and (2) the probable positive affects of the program supplied energy efficient lighting installations on future installations by the building owner resulting from lower utility bills.

5.3.1.4 Implementation Theory for the Lighting Program Component.

Exhibit 5.17 and Exhibit 5.18 present the Implementation theory diagram and the linkage descriptions for the implementation theory for the LightWash lighting program element, respectively.

Again, while this exhibit is self-explanatory, several aspects of the program and exhibit are worth explaining. First, the lighting component is only operated in PG&E's service territory. Second, the primary avenue for marketing the lighting element of the LightWash Program was through the lighting vendors that implement the program. These vendors target market individual locations, presenting the program, its benefits, and how to participate. In addition, LightWash promoted the program and distributor shows and coin laundry association meetings

Exhibit 5.15
Program Theory for Lighting Component of LightWash Program

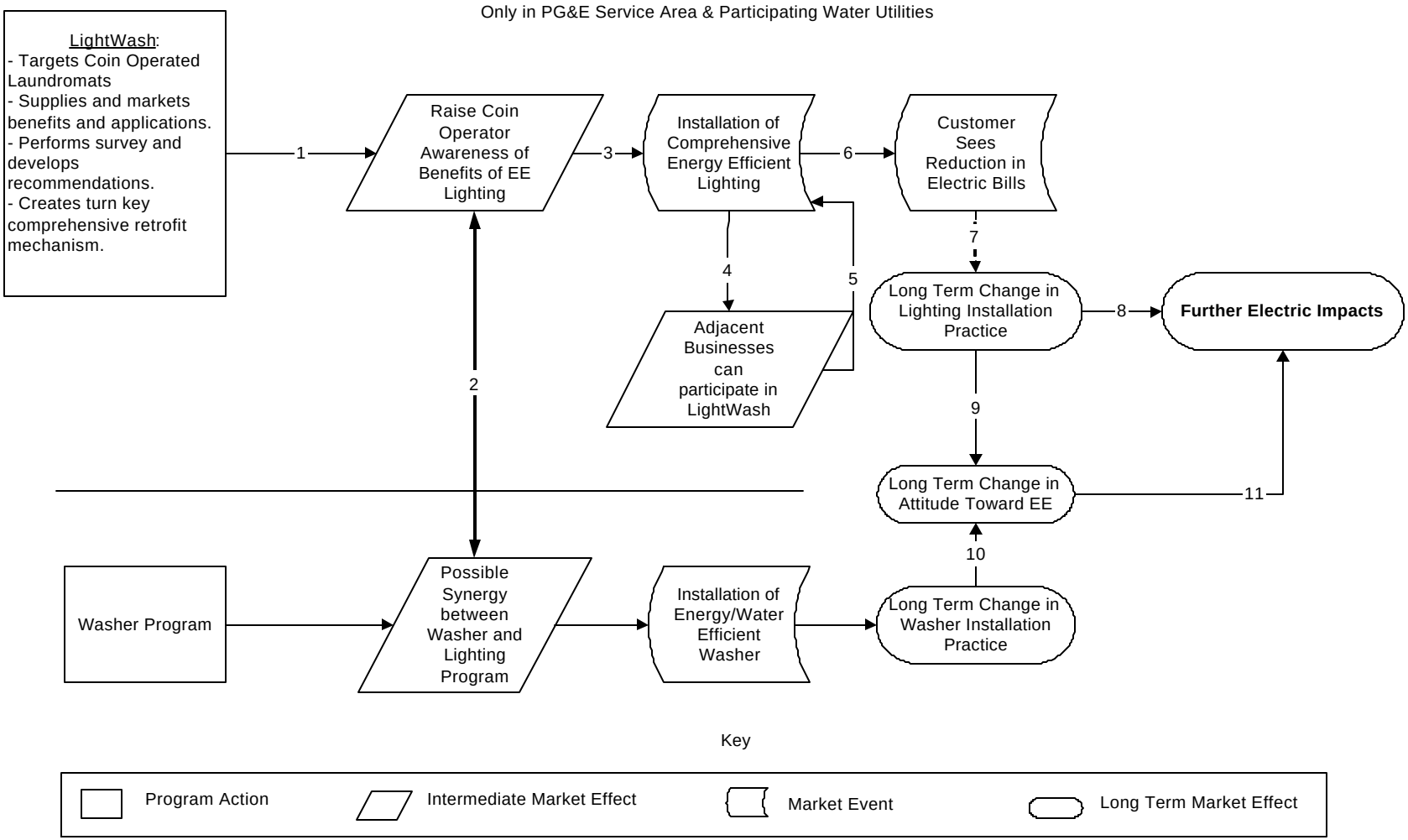


Exhibit 5.16
Program Theory Linkage Descriptions for the Lighting Component of the LightWash Program

Linkage	Causal/Communication Link Description
1	LightWash delivers an integrated program to recruit the target audience (hard to reach coin operated Laundromats) and supply them with a turnkey assessment and installation. The marketing raises the awareness of the coin Laundromat operator of the benefits of energy efficiency.
2	The awareness of the benefits of energy efficiency is possibly supported by similar information from the washer component of the program
3	The heightened awareness and the presence of the program cause the installation of energy efficient lighting under the program.
4	The participation of the coin operated Laundromat makes adjacent businesses in the same complex eligible for the lighting component of the LightWash program.
5	Availability of the program and marketing by the program leads to installation of more energy efficient lights.
6	Participants in the program see reductions in their electric bills due to the participation in the program.
7	Visible reductions in electric bills increase the probability that they will install energy efficient light fixtures in the future
8	Installation of additional lights in the future results in decreased electric use in future.
9	Decreased electric bills and change in long-term attitude toward energy efficient lighting contributes to an overall long term change in attitude toward energy efficiency in general.
10	Possible participation in the washer component of LightWash further contributes to an overall long-term change in attitude toward energy efficiency in general.
11	Overall long-term change in attitude toward energy efficiency in general increases probability of installation of energy efficiency measures resulting in long-term gas and electricity impacts.

Exhibit 5.17
Implementation Theory for Lighting Component of LightWash Program

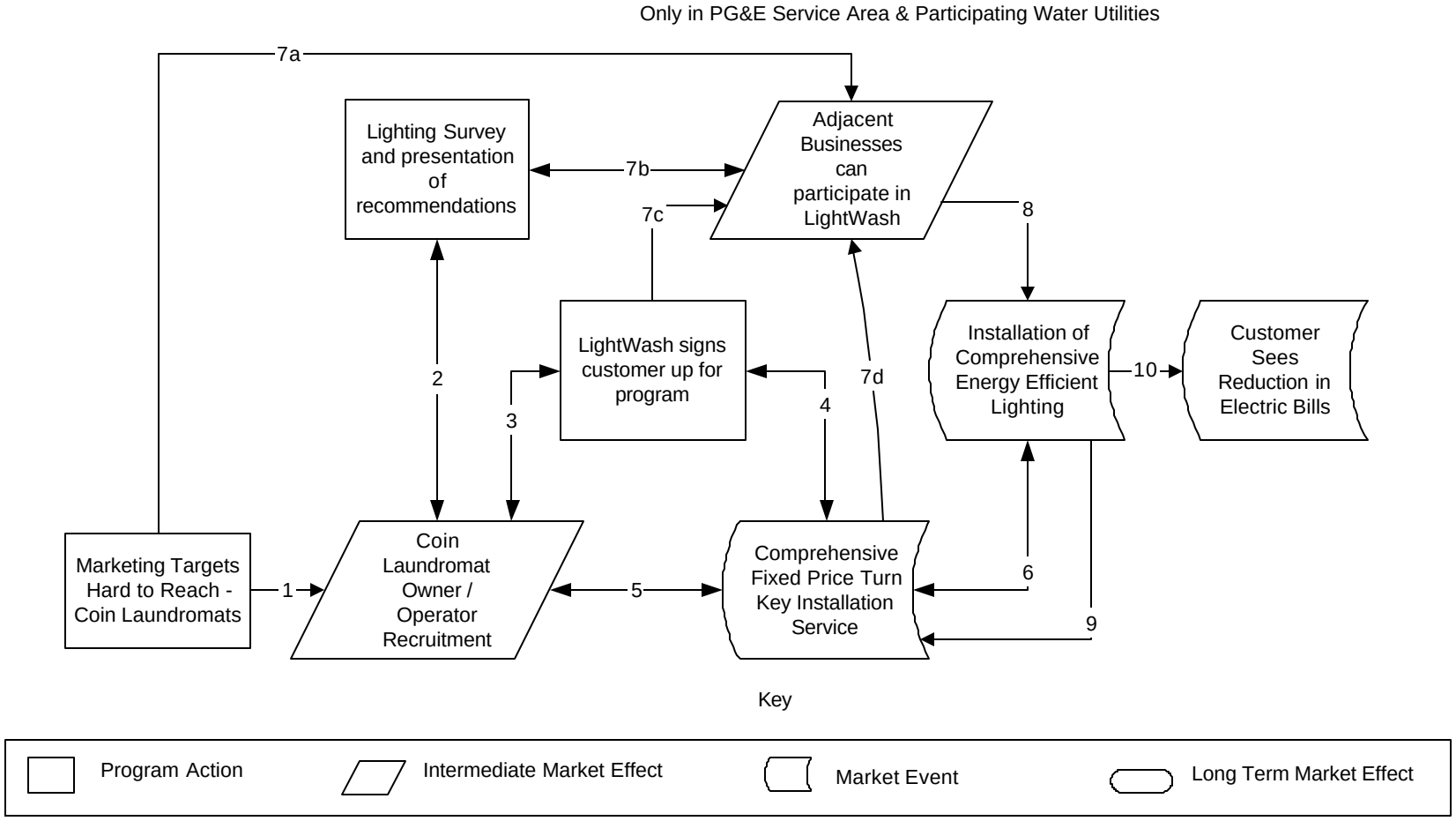


Exhibit 5.18
Implementation Theory Linkage Descriptions for the Lighting Component of the LightWash Program

Linkage	Causal/Communication Link Description
1	LightWash markets program to target hard-to-reach customers.
2	Once customers sign access agreement, LightWash performs site survey and develops and presents recommendations (work order).
3	If customer agrees to recommendations and cost structure estimates, LightWash signs customer up for program.
4	LightWash finalizes agreement on planned installations with contractor for fixed price installation.
5	Vendor works directly with coin operated Laundromat owner on plans and scheduling of installation.
6	Contractor completes installation and is responsible for disposal of all equipment removed.
7	As soon as coin operated Laundromat customer agrees to participate, other businesses in the same complex are eligible to participate in the LightWash program. At that point all recruitment and program services apply: 7a) marketing, 7b) survey and recommendations, 7c) sign up, 7d) set-up of contract (Work Order and Agreement)
8	Installation of other buildings in complex.
9	Once installation is complete, LightWash inspects installations, pays vendor incentive. Customer is responsible for paying vendor for any portion of the job cost not covered by incentives (Customer Cost Share).
10	Participants in the program see reductions in their electricity bills due to the participation in the program.

5.3.2 Measurement of Market Indicators

The Program has not been in the field long enough to estimate if projected long-term outcomes have occurred. However, the program actions and outputs of the program can be assessed to determine the potential for long-term outcomes. This section sequentially presents:

- each link in the program theory that was evaluated,
- the analysis of the data collected for the linkage, and
- the *conclusions* based on the data.

The results of the washer component of the program are provided first, followed by the lighting component.

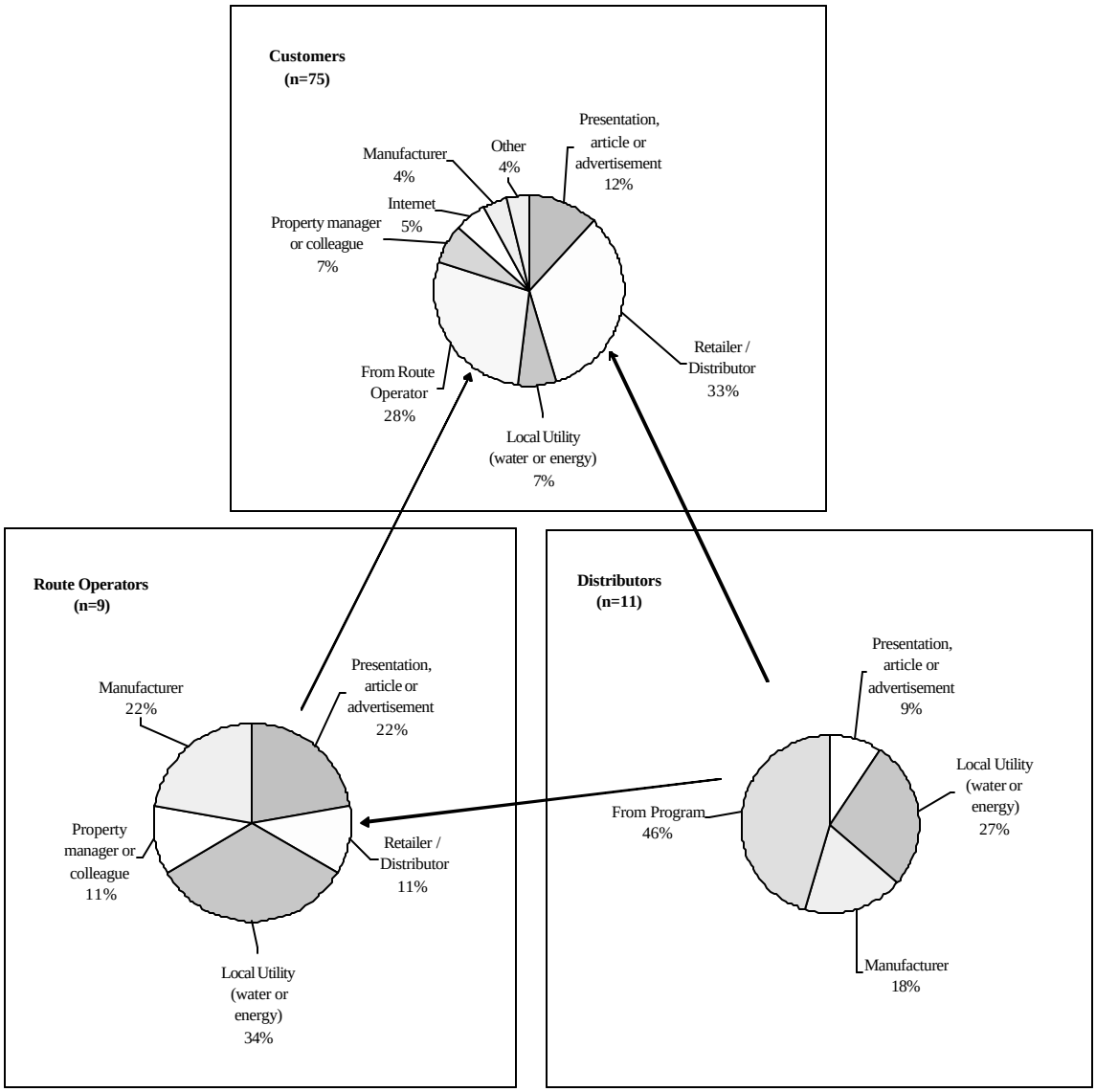
5.3.2.1 Washer Market Indicators

Link 2 Program Action	*Either the water district or LightWash offers information on the rebate and the utility benefits of the program to Market Actors:*

The flow of information about the washer component of the Program, and the level of integration, was inferred from asking the customers where they heard about the Program. As seen in Exhibit 5.19 below, customers heard about the program from an array of different sources (the numbers shown in this exhibit reflect multiple responses from some respondents). What is interesting is that well over half of the customers heard about the Program from either their Route Operator or a Distributor. The distributors most often learned about the Program directly from Program staff or their local water utility and then passed on this information to 11% of the route operators. The Route Operators appeared to be closely tied in with their local water utility as they found out about the program most often from the water utility. However, a little less than one-quarter of the Route Operators learned about the program from marketing activities directly attributable to the Program (i.e., articles, advertisements). Discussions with program staff identified the fact that the manufacturers found out about the program, and were kept informed about program changes, directly from LightWash staff. This means that all of the distributors, and a large proportion of the route operators found out about the program as a direct result of LightWash marketing of the program.

Conclusion: The Program uses an integrated approach that allows the customer to learn about the Program via many different avenues. The market actors targeted by the Program through either direct marketing or advertisements pass on information about the Program to their customers. Overall the program has developed a comprehensive and effective marketing system.

Exhibit 5.19
Where Heard about Washer Component part of the Program



Link 3 *Intermediate Output*	*The information and rebate offer raise the awareness of the route operators, distributors, and customers about the operational, financial, water and energy benefits of energy efficient washers.*

The route operators and distributors were aware of the benefits associated with energy efficient washers. Of the seven distributors who were queried (i.e., those who had seen Program information), all said they were very aware of the benefits. For the seven route operators who had seen Program literature, three stated they were "very aware" and four indicated they were "somewhat aware". The Program information moved two route operators from the "somewhat aware" category to the "very aware" category according to their self-report.

The awareness on the part of the customers was changed by the Program literature, albeit the customers had some level of awareness before seeing any of the program material. (Sixty-four percent of the customers surveyed had heard of Energy Star Clothes Washers before the program.) Exhibit 5.20 presents statistics establishing that the change in customer awareness was statistically significant at greater than 99% confidence (i.e., the likelihood that this would have occurred by chance is one chance in one-hundred occurrences).

Exhibit 5.20
Customer Awareness of Clothes Washer Benefits

	N	Mean*	St. Error of Differences	Level of Significance
Prior to seeing the program material on high efficiency clothes washers, how aware were you of their benefits?	69	2.93	0.1289	>0.01
After reviewing the program material on high efficiency clothes washers, how aware were you of their benefits?	61	3.59		

*Scale of 1 to 4 where 1='not at all aware' and 4='very aware'

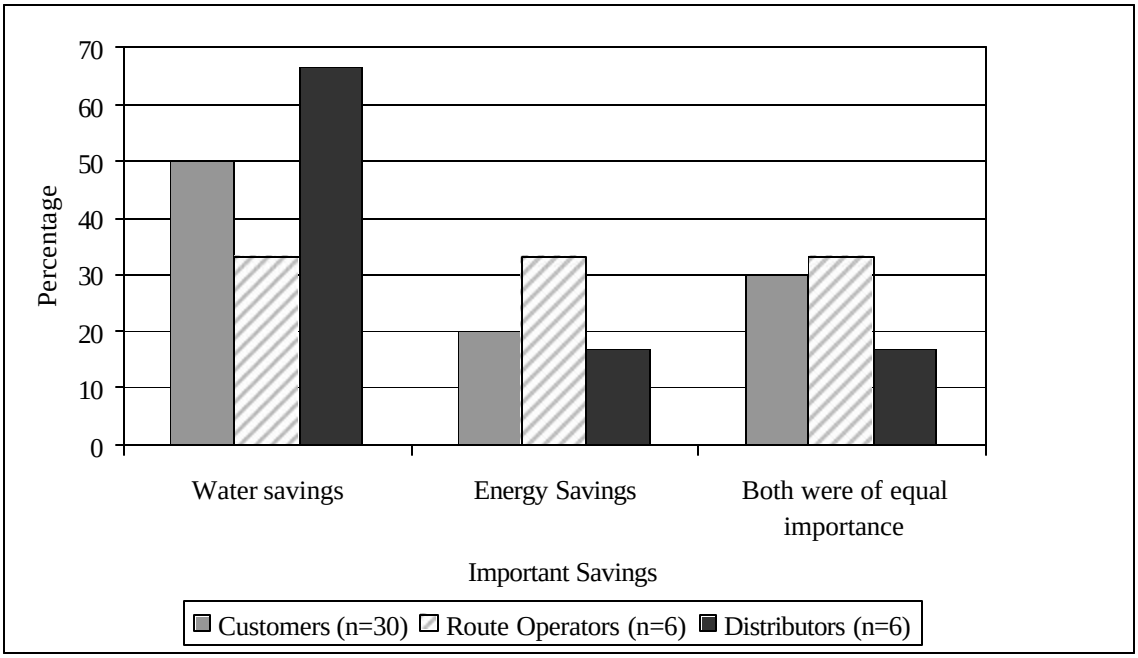
Conclusion: The Program successfully raised participating customers and route operators awareness of the benefits of high efficiency clothes washers through their Program literature. Distributors stated they were already very aware of the benefits.

Link 4 *Intermediate Output*	*Increased awareness of EE benefits of washers leads to Market Actor belief that the information is true.*

The literature appeared to raise awareness among market actors, but was the information provided by the literature perceived as true? For the customers, only about half actually remembered the percentage reductions touted by the program literature for potential electric, gas, or water savings. Of those who remembered (n=29), all either found the values "somewhat believable" (48%) or "very believable" (52%). All the route operators and distributors also felt that the values were "somewhat believable" or "very believable".

While not directly applicable to this particular link, it was of interest to find out if water or energy savings noted in the Program literature was of most importance. The market actors were asked whether they considered energy savings or water savings to be of most important to them or to their customers. As seen in Exhibit 5.21, water savings appears to be more important than energy savings among most of the market actors. For the customers, which had a large enough sample to be meaningful, over twice as many rate water savings most important compared to energy savings.

Exhibit 5.21
Importance Between Water or Energy Savings



Conclusion: Those who see the information believe the potential savings indicated in the Program literature. In addition, customers seem to place more value on water savings than energy savings.

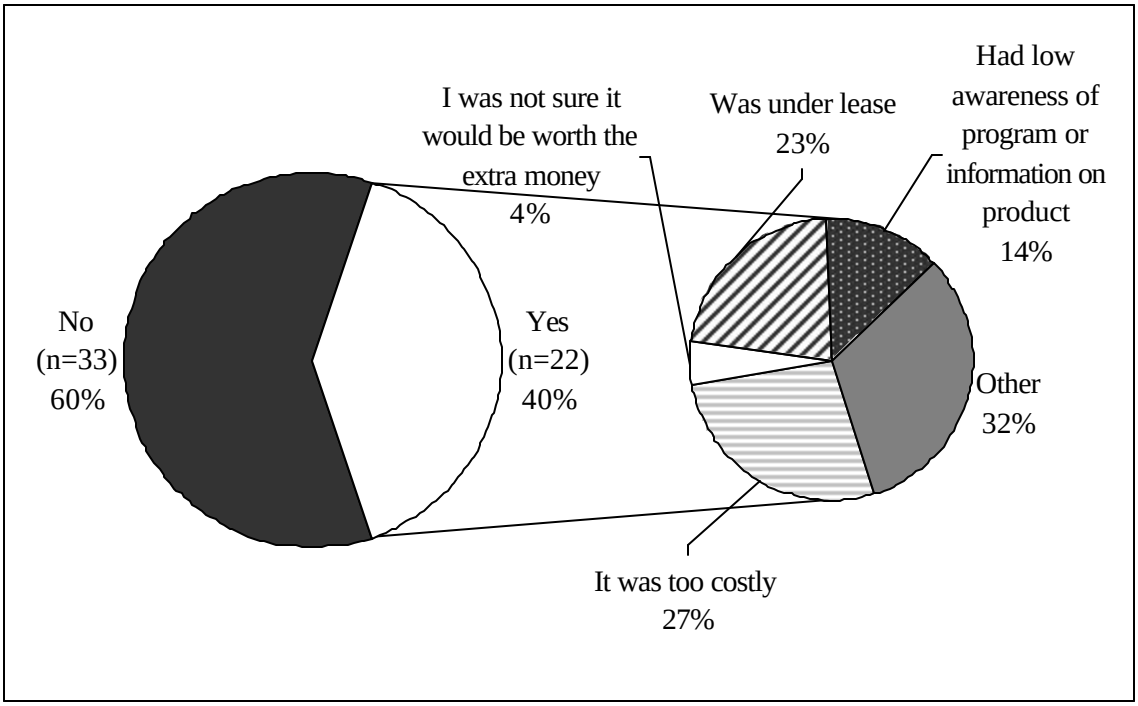
Link 5 Intermediate Output	*The belief that the information is true causes the Market Actor to install energy efficient/water efficient washers.*
Link 13 Intermediate Output	*Building owner recognizes business/financial advantage of installing energy/water efficient washers and changes practice leading to the installation of more or additional machines in other locations.*

Among the participating customers, over half had not even looked into changing their clothes washers before participation in the Program. Exhibit 5.22 shows that of the 22 customers who had looked into the possibility of installing high efficiency machines prior to the Program, about a quarter felt it was too costly, another quarter could not change out due to contractual obligations, and some indicated they did not have the needed information. The route operators indicated that, while they were looking into high efficiency machines, they were not installing them because there was no pressure from their customers to do so. Distributors stated that while customers were looking, most were not buying due to cost. The distributors self-reported that sales on the rebated washers rose, ranging from a 20% to 70% increase, after the Program began.

A little over half of the customers (65%) indicated that they have clothes washers at other sites and 65% of those customers (42% of customers with machines at multiple sites) indicated that there were high efficiency machines at those other sites. These customers took advantage of the

rebates for the high efficiency machines at the majority of these sites, but 36% of the machines were installed without the incentive – mainly because they had installed the machines before the rebates were available. A few customers had installed machines that were ineligible for the Program and a few more indicated they had not yet sent in their rebate forms, but were planning to do so. This infers that the customers recognized the advantages of high efficiency clothes washers and took action based on that knowledge, but they may not do so in the absence of the program rebates.

Exhibit 5.22
Customers Who Where Thinking of Installing Efficient Machines Before the Program



Conclusion: The installation of high efficiency clothes washers appears to be due more to the rebate than simply the belief in the provided information.

Link 6 Long Term Outcome	*The belief that the information is true has a long-term effect on the Market Actor's attitude toward energy efficiency in general.*

Although the Program has not been in the field long enough to cause a "long-term" effect (assuming a lasting effect over years) that could be measured, customers were queried about whether their participation changed their current attitudes. Thirty-seven percent (37%) of the customers indicated no change in their attitudes (n=26, mean=3.7 on scale of 1 to 4). Exhibit 5.23 shows that there was a change in the self-reported attitudes for the remaining 63% of customers that was statistically significant at greater that the 99% confidence level (i.e., the likelihood that this would have occurred by chance is one chance in one-hundred occurrences),

although most customers felt their attitudes were fairly positive at the onset. This table indicates that the

The attitudes of the majority of route operators and distributors did not change. In general, they both had a self-reported attitude towards energy efficiency that was very positive.

Exhibit 5.23
Clothes Washer Customer Attitude About Energy Efficiency in General

	N	Mean*	St. Error of Differences	Level of Significance
Prior to participating in the program, would you say you were very, somewhat, not very, or not at all positive about energy efficiency in general?	39	3.36	0.1300	>0.01
After participating in the program, would you say you were very, somewhat, not very, or not at all positive about energy efficiency in general?	39	3.74		

*Scale of 1 to 4 where 1='not at all positive' and 4='very positive'

Conclusion: The Program has a positive impact on participating customers current attitudes towards energy efficiency.

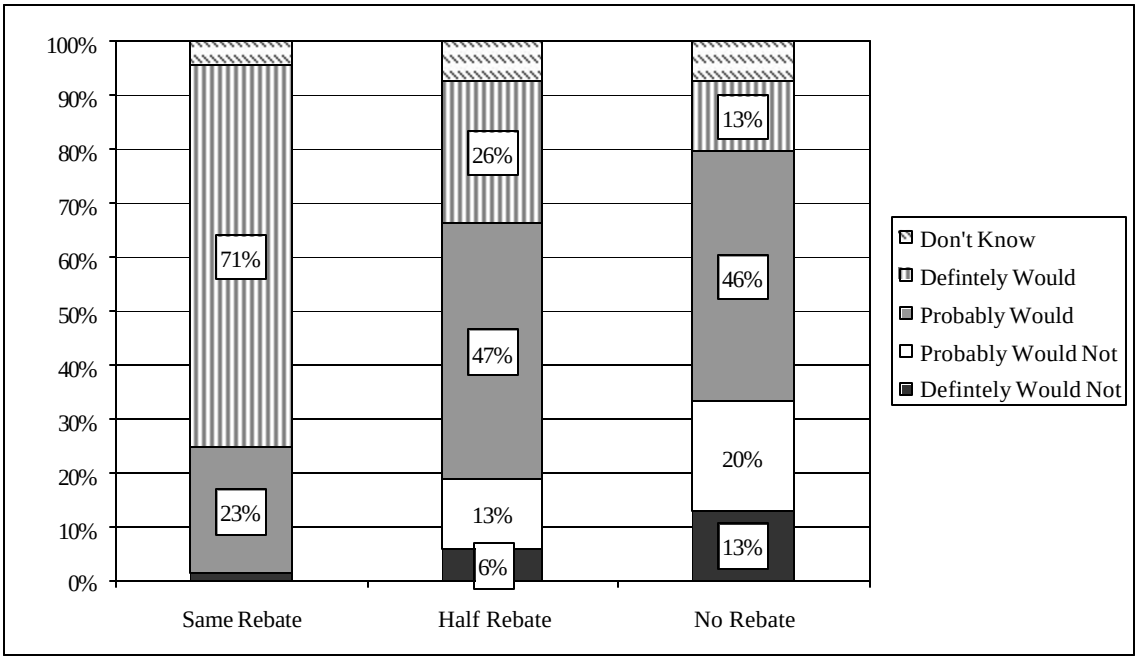
Link 7 *Intermediate Outcome*	*Even if the Market Actor does not install an energy efficient washer under the program, acceptance that the information is true increases the likelihood that the Market actor will install an energy efficient washer at some point in the future.*

Since most of the market actors found the information on potential savings from the clothes washers believable, possibly the more relevant question was whether they would install similar efficient machines in the future if the Program changed rebate levels. As shown in Exhibit 5.24, the possible rebate level had a distinct effect on the percent customers who indicated they "definitely would" install energy efficient clothes washers in the future. The differences in the overall willingness to install based on the different rebate scenarios were statistically significant at the 99% confidence level between each grouping (i.e., the likelihood that this would have occurred by chance is one chance in one-hundred occurrences). As a group, the customers were responsive to the rebates, but less likely to purchase if there were no rebates.

Most of the route operators indicated that they would install efficient machines in the future (two stating they "definitely would" and four stating they "probably would" install). Two indicated they probably would not, though this was because they felt that the machines were not of industrial quality, they are hard to work on, and the program process slows down the installation time. While route operators may have the perception that the program process slows down

installations, this is not possible as LightWash only accepts rebate applications once the washers have already been installed.

Exhibit 5.24
Customers Potential for Future Installation of Clothes Washers



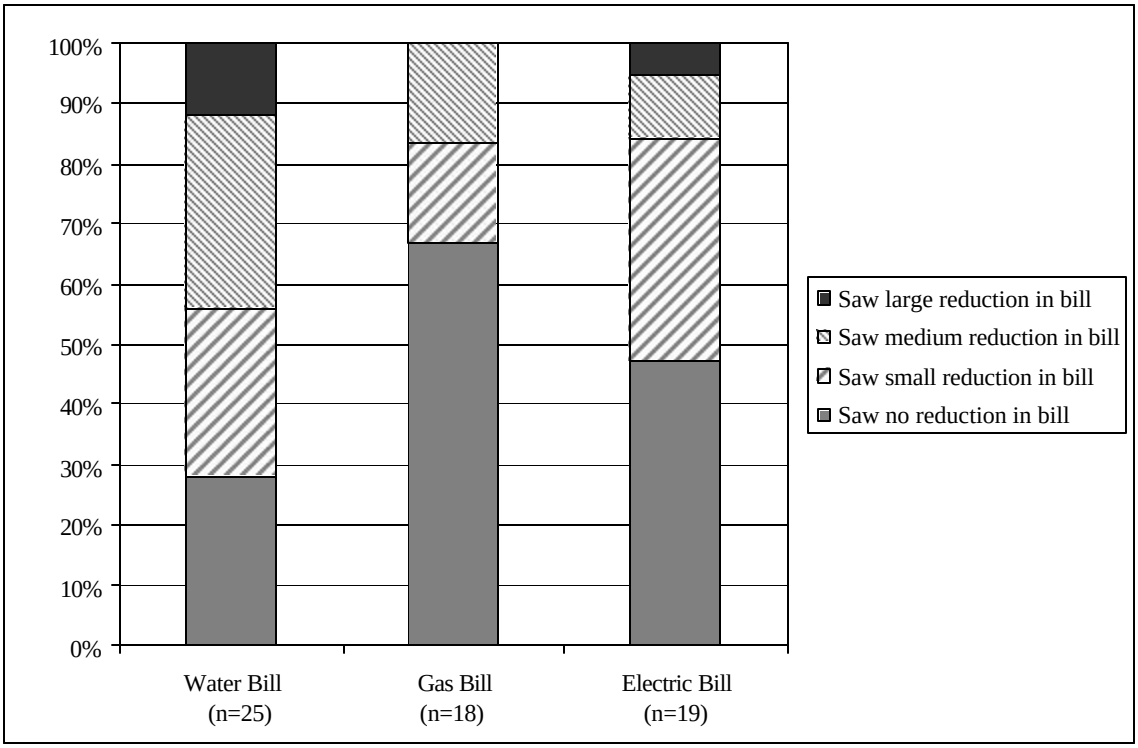
Conclusion: The likelihood of installation of high efficiency clothes washers in the future appears to be more a function of possible rebate level than acceptance of the information provided.

Link 10 *Market Event*	*Building owner receives lower water, gas, and electricity bills due to improved machine efficiency.*

The evaluation used a self-reported bill reduction to determine if this market event occurred. Almost 40% of the customers looked at their water bill closely, while 31% looked closely at their electric bill, and 29% looked closely at their natural gas bill. Of those who looked at their bills closely enough to discern a difference, over 70% saw reductions in their water bills while a little over half saw decreases in the electric bill and one-third saw reductions in their natural gas bill.

Conclusion: While the reduction in the water bill was most noticeable to customers, some customers also reported noticeable reductions in electric and gas bills.

Exhibit 5.25
Customers Who Saw Differences in their Utility Bills



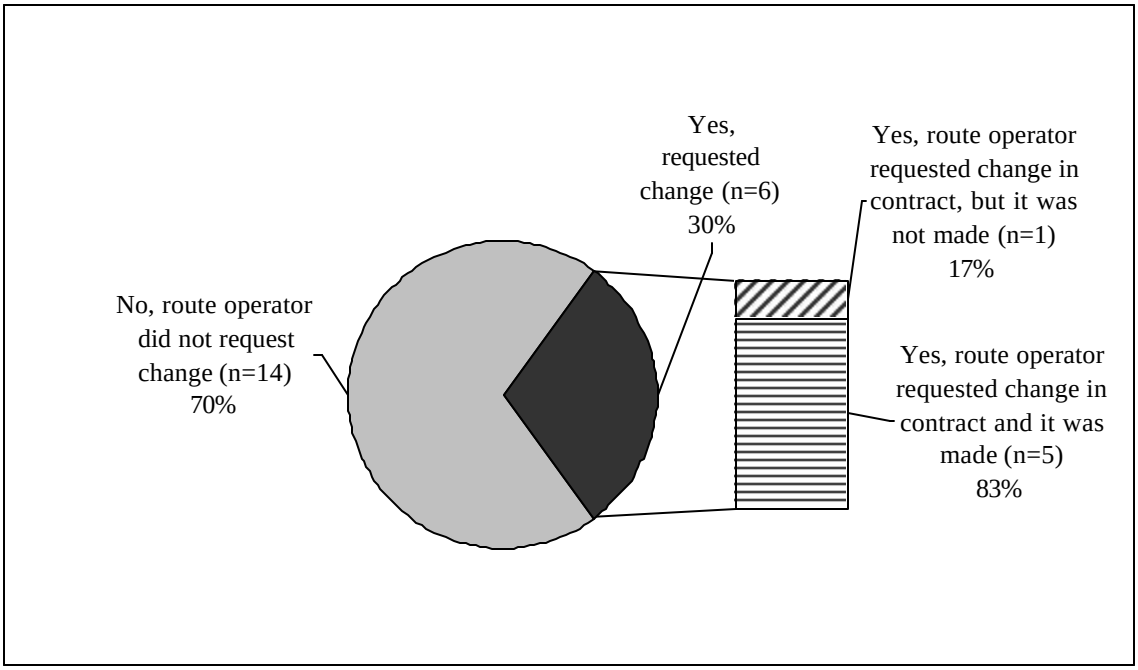
Links 11 & 14 *Intermediate Output*	*In the case of route operators, the installation of energy efficient washers logically leads to renegotiation of the typical contract terms between the building owner and the route operator in order to compensate the route operator for the higher cost of the energy efficient washers, and to pass on some of the savings that the building owner sees due to the lower utility bills.*

Only 30% of the customers queried used route operators as the avenue for purchase and installation of the clothes washers. The route operators generally own and operate the washers and have a contract with the building owner that defines the coin box split. The building owner receives the benefit of the possible decrease in utility bills and receives the rebate from the program for the installation of the high efficiency washers. This is a classic case of split incentives – the route operator pays the extra costs for the installation of the high efficiency machine, but sees none of the revenue benefits. The main way for the route operator to recoup that added cost of installing high efficiency washers is to renegotiate the lease agreement with the building owner so that they receive some of the benefits. Exhibit 5.26 shows that most of the customers' route operators did not request a new contract as a result of the installation of the high efficiency machines, but when they did, there was a high likelihood of renegotiation.

On the route operator side, five of the eight interviewees did not renegotiate their lease. Reasons such as "...customers often reject changes in the contract" or "Don't know what I could renegotiate. I rent the space and own the machines. No reason to renegotiate." were given as

reasons for not looking into a new lease. One indicated they simply charged more per wash on the high efficiency machines.

Exhibit 5.26
Customers Whose Route Operators Requested Contract Change



Conclusion: There seemed to be little attempt at renegotiations in the route operator contracts. However, the few times renegotiation was requested, it resulted in changes in contract terms.

Link 18 *Intermediate Output*	*Synergistic effects of lighting program encourages the owner to consider installation of energy/water efficient washers.*

There was not enough data from the washer customers surveyed to properly assess this linkage. Only 4 customers (6% of the surveyed population) were eligible to participate in the lighting component. Of those four, three stated that the lighting component did not influence their washer installations at all while one person did not know if there was any influence.

Other Area of Inquiry

One of the lesser known parameters in the calculation of impacts from high efficiency clothes washers is how many times the machines are actually used per day (the industry terminology for a single use by the machine is a "turn"). As this evaluation was not able to meter a representative sample of machines to obtain this information, the surveyed customers were each asked how often a typical machine was used per day at their site. Of the 39% of the customers who answered this query, the overall average was 6.0 turns per day. When separated into

laundromat (n=8) and multi-family dwellings (n=18), the averages became 3.63 and 7.28, respectively. As the question was stated: "For the facility we are discussing, what is the average number of the times the typical machine is used each day?"**,** the responses suggest a misunderstanding of the piece of data being requested. One multifamily customer stated that the average machine was used 20 times per day. This value is quite high and may have represented the number that all the machines at the site are used in a day, but since the specific number of machines at the site was not collected, the average turns per day cannot be calculated for the responses that appear to be outliers. In the future a different approach should be used to obtain actual data on the turns per day since the self-reported values appear too unreliable.

The data collected from the lighting surveys is presented next.

5.3.2.2 Lighting Market Indicators

Link1 Program Action	*LightWash delivers an integrated program to recruit the target audience (hard-to-reach coin operated laundromats) and supply them with a turnkey assessment and installation. The marketing raises the awareness of the coin laundromat operator of the benefits of energy efficiency.*
Link 4 Program Action	*The participation of the coin operated laundromat makes adjacent businesses in the same complex eligible for the lighting component of the LightWash program.*

The program participants were asked where they heard about the rebate for the Program. As Exhibit 5.27indicates, the customers learned about the program through a variety of different mechanisms, although the majority of participants found out from a colleague, an adjacent business, or a person (Program trade ally) coming into their business. Link 1 indicates that the coin-operated laundromats are the target market. The data shows that the laundromats learned about the program from multiple sources, whereas 81% of the non-laundromat sites learned about it from an adjacent business or a trade ally coming into their business (after the laundromat site was already recruited).

Exhibit 5.27
How Lighting Participants Learned About Program

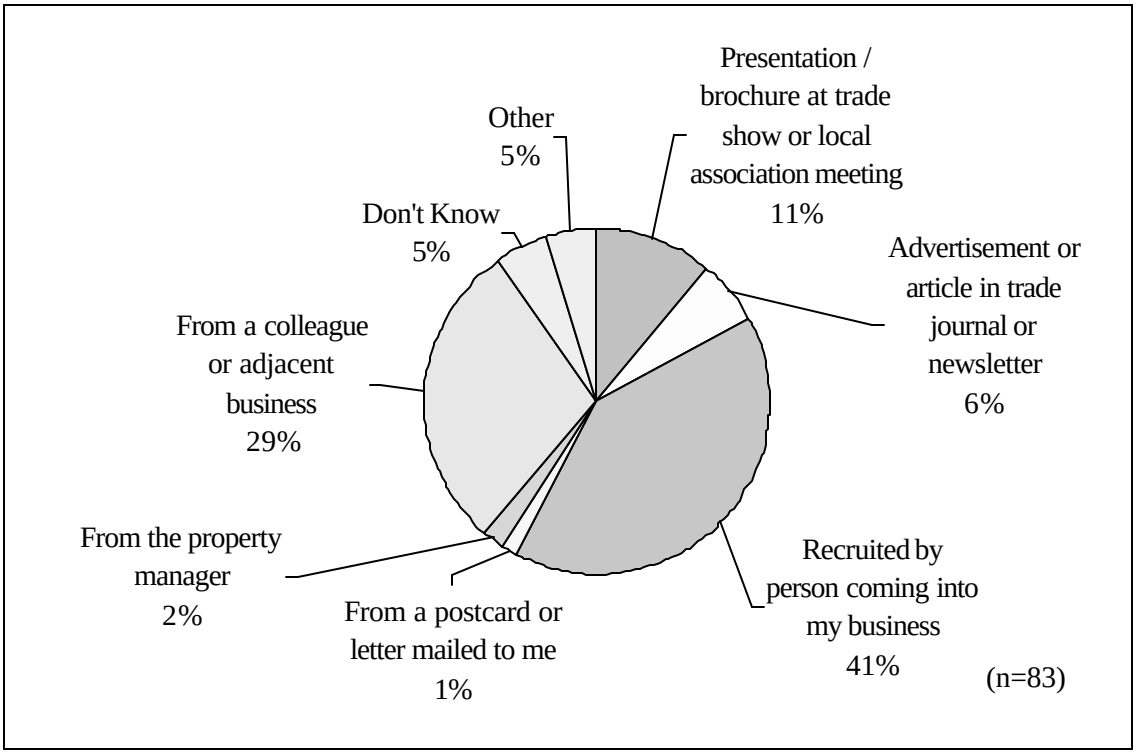
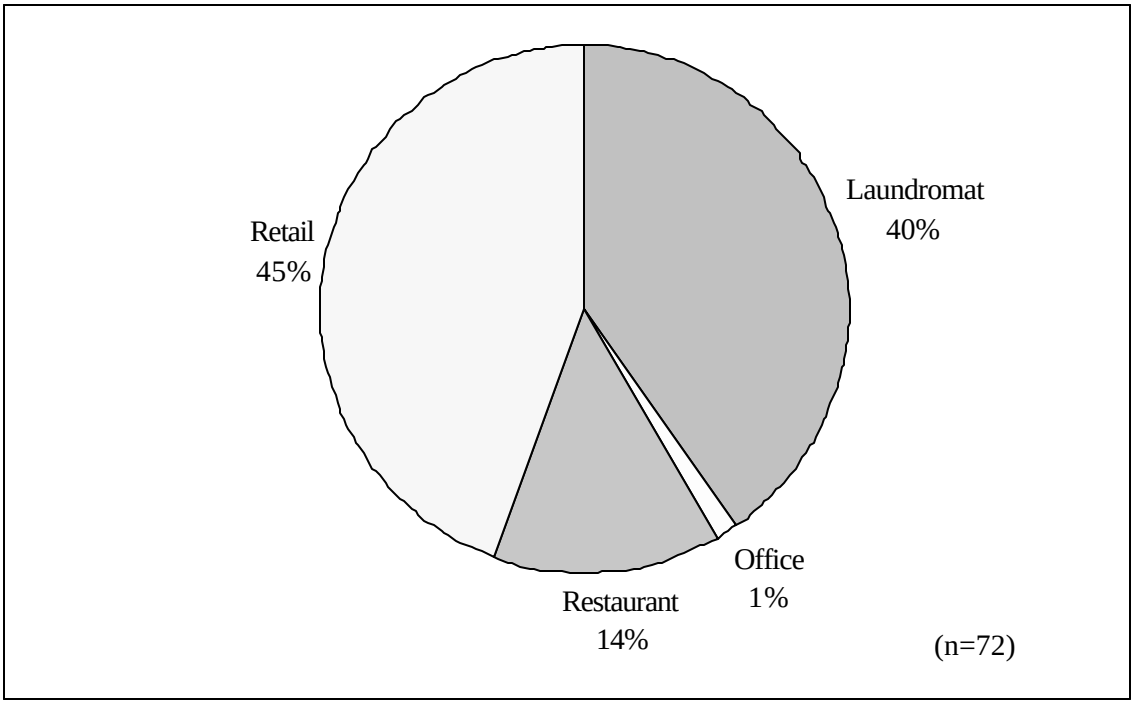


Exhibit 5.28 shows the distribution of lighting participants by business sector for the customer that participated in the telephone survey. Not only are adjacent businesses eligible for participation, they actively participated as shown by fact that 60% of the surveyed population fall into categories other than laundromats. A marginally significant relationship was found between business types and whether the site had already been investigating installation of energy efficient lighting - while laundromats may have been looking into lighting the adjacent stores were not (Chi-Square=3.4, p=0.063).

Exhibit 5.28
Lighting Participation by Business Type

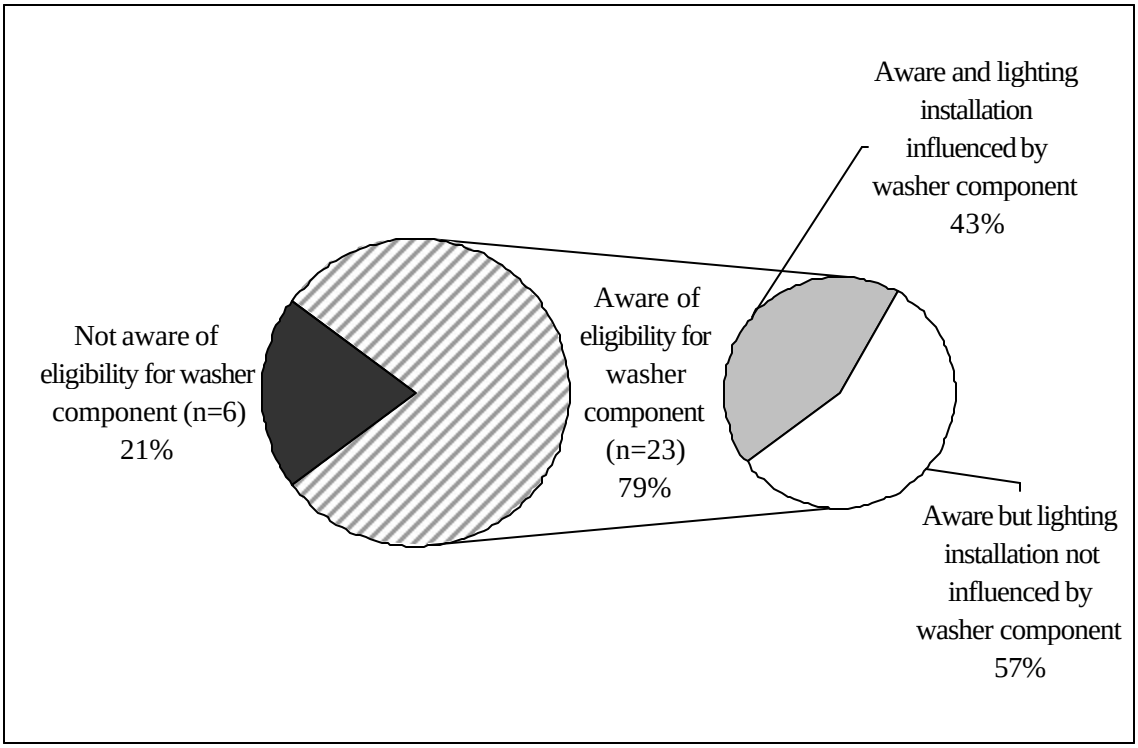


Conclusion: The program is well marketed and successfully addressed the target market. It appears to pull in small retail stores.

Link 2 *Intermediate Output*	*The awareness of the benefits of energy efficiency is possibly supported by similar information from the washer component of the program*

Analysis of the data collected for this link attempted to determine if there were synergy between the two components of the program.

Exhibit 5.29
Awareness of the Washer Component



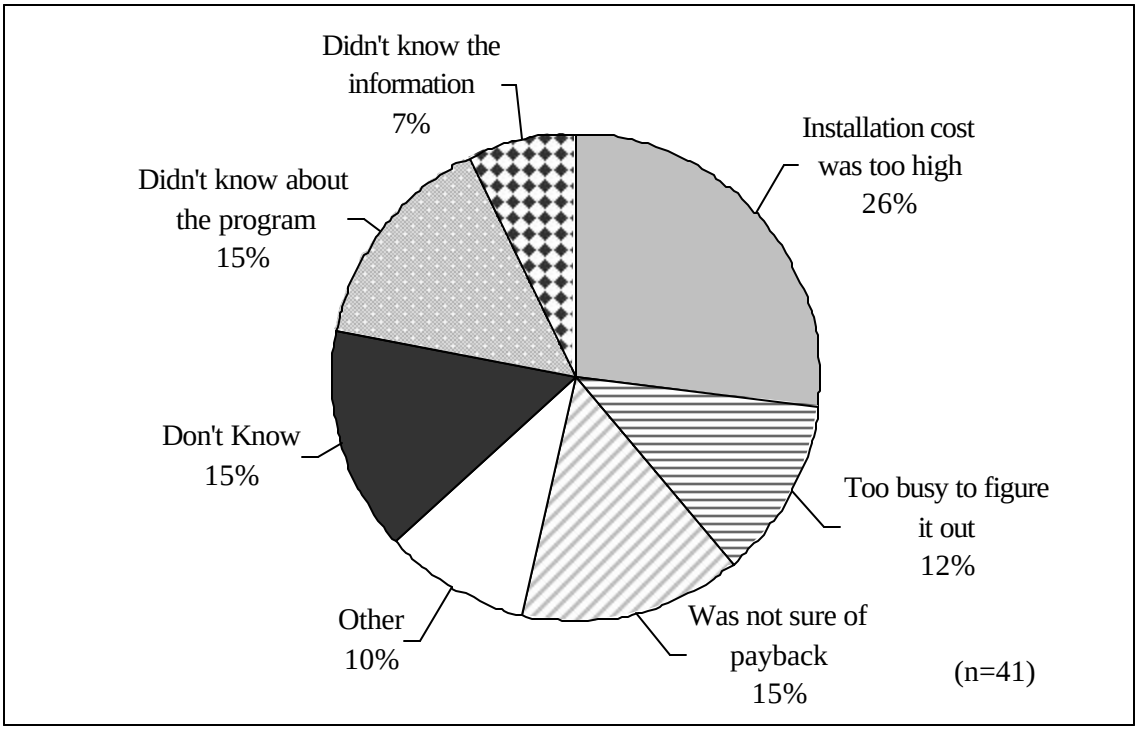
As Exhibit 5.29 shows, 79% of the laundromat sites that participated in the lighting component of the program were aware their eligibility for the wash component of the program. Of those that were aware, 43% stated that the washer component influenced their decision on the lighting. Many learned about the lighting program because of the possible washer retrofit.

Conclusion: The washer component of the Program created synergy with lighting installations.

Link 3 *Market Event*	*The heightened awareness and the presence of the program cause the installation of energy efficient lighting under the program.*
Link 5 *Intermediate Output*	*Availability of the program and marketing by the program leads to installation of more energy efficient lights*

The main idea behind these linkages is that the customer most likely would not have made energy efficiency lighting installations unless the Program had been available. The telephone survey indicated that 46% had already looked into the possibility of installing energy efficient lighting, but had not installed them for various reasons (Exhibit 5.30, multiple responses from some respondents).

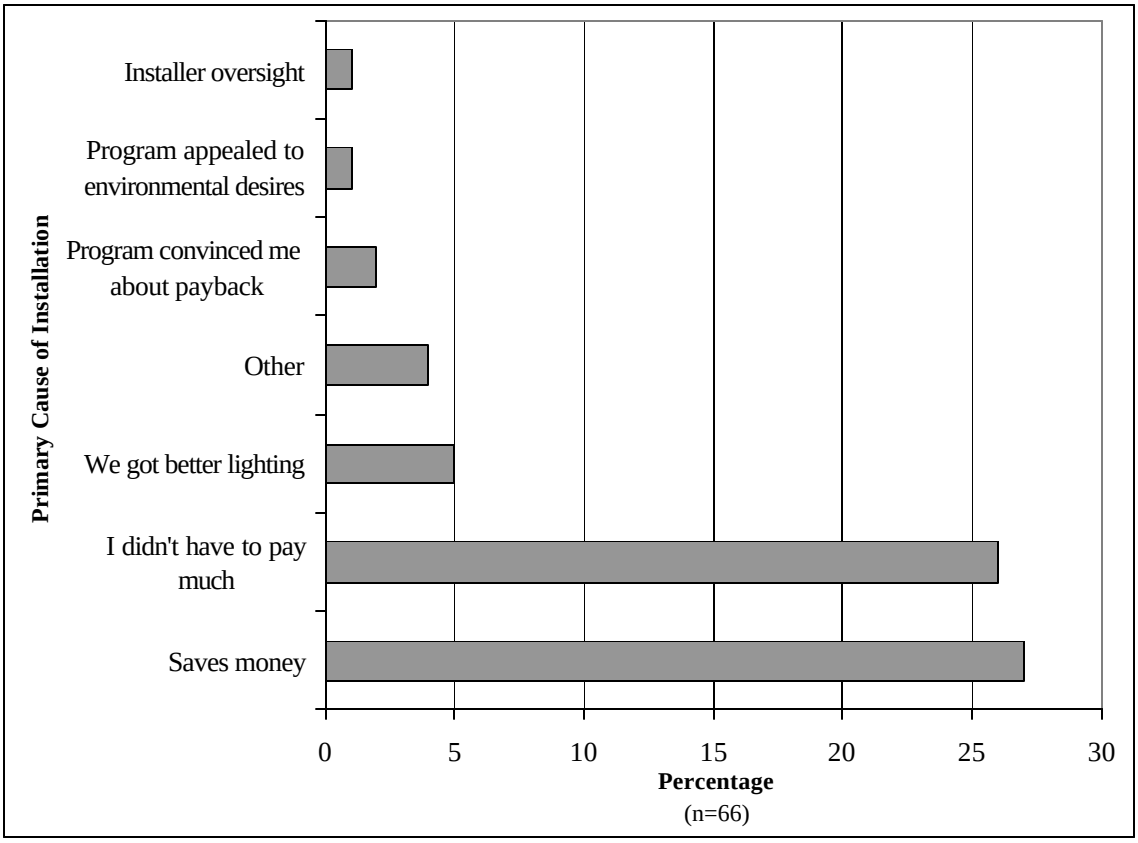
Exhibit 5.30
Reasons Why Did Not Install EE Lighting Before the Program



The Program provided information to the customer about potential payback, provided incentives to actually install, and assured installation without need for oversight by the customer. Essentially, the Program took away many of the reasons for the 46% who were undecided about installing lights and appeared to have moved the 54% of customers who had not even thought about installing energy efficient lights.

The primary reasons given by the customers for participating revolved around money – not needing to provide cash outlay to obtain the measure and the expectation of money saved from bills in the future. Exhibit 5.31 shows that over half of the customers indicated that these were the primary reason for installing the energy efficient lighting.

Exhibit 5.31
Primary Reason for Participating in Lighting Program

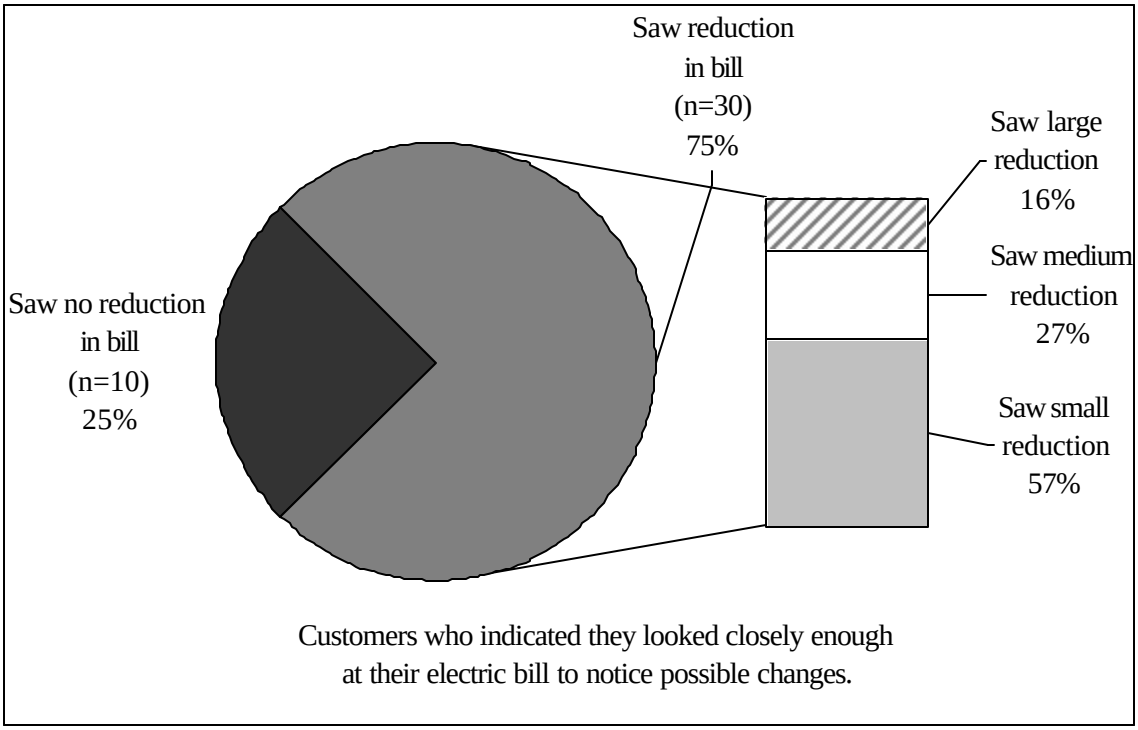


Conclusion: The Program appears to cause energy efficient lighting installations that would not otherwise have occurred.

Link 6 *Intermediate Output*	*Participants in the program see reductions in their electric bills due to the participation in the program.*

The question of whether participants saw reductions in their bills can only be answered by those people who actually look closely enough at the bill to see a reduction (if it occurs), and of that group, those whose installation occurred enough in advance of the survey to have received an electric bill. There were 64% of the customers who stated that they look at their bill closely each month and could assess any reduction. Exhibit 5.32 shows that 75% of the customers who looked at their bills closely actually saw a reduction, although most only saw one they considered small or medium.

Exhibit 5.32
Customers Who Saw Reduction in Electric Bill

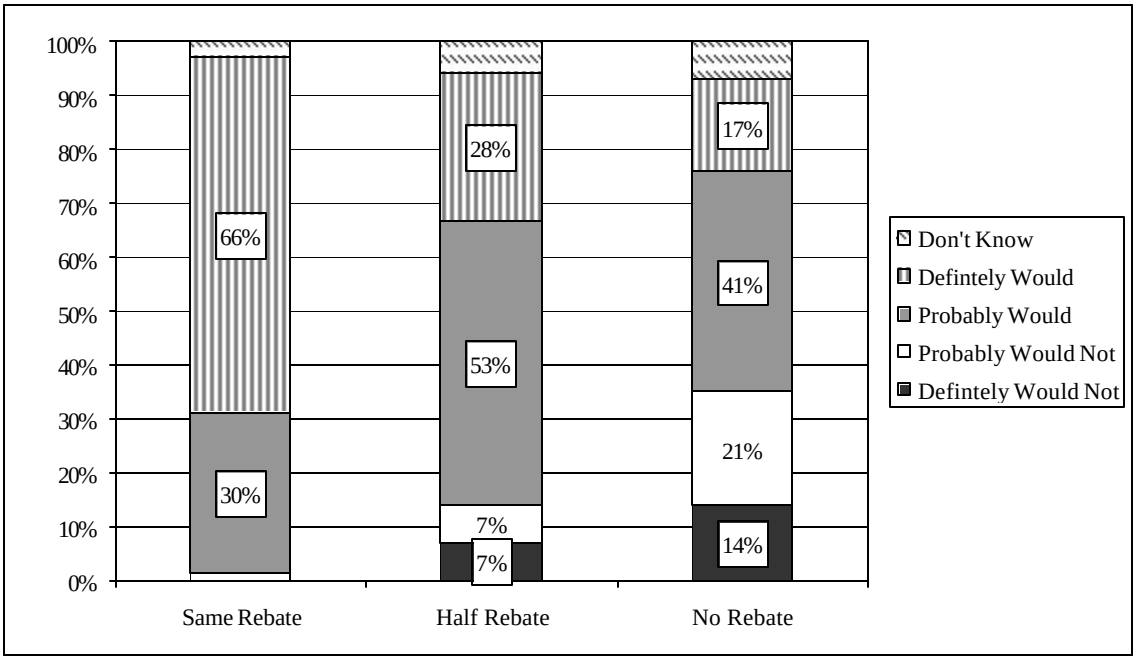


Conclusion: Most customers who looked at their bill closely enough to observe a change saw a small or medium size reduction in their electric bills after installation of energy efficient lighting.

Link 7 *Long Term Outcome*	*Visible reductions in electric bills increase the probability that they will install energy efficient light fixtures in the future*

It was not expected that this evaluation would be able to observe long-term market effects due to the proximity of participation and the telephone survey. However, customers were asked about the possibility of long-term actions to get a sense of their potential future actions. They were also asked about their potential for future actions depending on availability of incentives that were similar are this program, half of what was currently available, or no incentives at all.

Exhibit 5.33
Potential for Future Purchases of Lighting



As one can see from Exhibit 5.33, the likelihood of installing lighting in the future decreases as the rebate is reduced or eliminated. This is not surprising given that the reasons for current participation shown in Exhibit 5.31 were mostly monetary.

Statistical tests done to determine if there was any difference between responses on potential future actions and whether the customer had seen a reduction in their electric bill. Even though there were few data points, a statistically significant difference was seen between customers who saw bill reductions and those that had not when the same rebate was provided (See Exhibit 5.34). However, this difference dissolved when only half the rebate was available or the rebate was absent.

Exhibit 5.34
Potential to Purchase in Future if Noticed Bill Reduction

Query	<q4b> After the energy efficient lighting was installed, did you notice a reduction in your bill?	N	Mean*	Std. Error Mean	Level of Significance
<q17a> Given your experience with the energy efficient lights, would you purchase EE lights when needed if the current rebates were available?	Yes	29	3.72	0.098	0.031
	No	10	3.3	0.153	
<q17b> Given your experience with the energy efficient lights, would you purchase high EE lights if HALF of the current level of rebates is available?	Yes	28	3.25	0.132	0.296
	No	9	3	0	
<q17c> Given your experience with the energy efficient lights, would you purchase EE lights when needed if there were no rebates available?	Yes	28	2.82	0.179	0.655
	No	9	2.67	0.236	

*Averages based on rating of "Definitely Would Purchase"=4, "Probably Would Purchase"=3, "Probably Would NOT Purchase"=2, and "Definitely Would NOT Purchase"=1

Conclusion: Customers who saw a reduction in their bills state they are more likely to install energy efficient lighting sometime in the future when a similar monetary incentive is available. However, when the incentive is half the current amount or absent there is no difference in stated potential future actions between those who saw a reduction in their bills and those who did not.

Link 9 *Long Term Outcome*	*Decreased electric bills and change in long term attitude toward energy efficient lighting contributes to an overall long term change in attitude toward energy efficiency in general.*

Thirty-five percent (35%) of surveyed participants stated that participation in the program did not change their attitudes about energy efficiency in general; it was very positive (Mean=3.7 out of 4.0). However, 65% of the customer did state that participation had an effect on their attitudes about energy efficiency. A statistical analysis of the change (shown in Exhibit 5.35) showed that the self-reported change in attitude was statistically significant at the 95% confidence level (i.e., there is one chance in twenty that his occurred by accident).

Exhibit 5.35
Change in Attitude after Lighting Installation

	N	Percentage of Customers	Mean*	St. Error of Differences	Level of Significance
Customers who indicated no change in attitude.	22	33%	3.7	-	-
Customers who indicated change in attitude: pre-program	44	67%	3.3	0.1460	>0.05
Customers who indicated change in attitude: post-program			3.7		

*Scale of 1 to 4 where 1='not at all positive' and 4='very positive'

Conclusions: The program improved customers' attitudes towards energy efficiency in general, at least in terms of their stated attitudes.

This completes the lighting component results. The conclusions and recommendations follow.

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6 FINDINGS AND RECOMMENDATIONS

6.1 Findings

6.1.1 Energy Impact Assessment

The energy impact findings of this evaluation are:

1. The LightWash program exceeded the net energy and demand savings goals set by the program, delivering the following results:

	kW	kWh	Therms
Total Program Net Impacts	623	3,933,094	450,076
Total Program Net Impact Goals	594	3,687,743	394,598
Program Net Realization Rate	105%	107%	114%

2. The program adequately documented program information through the program database

6.1.2 Market Impact Assessment

The conclusions for the washer and lighting market impact analyses are presented below by program element. In doing so it provides an overall picture of the program effect on the market indicators.

Washing Machine Component. The findings from the efficient washer component market indicator assessment are:

1. The Program successfully raised participating customers' and route operators' awareness of the benefits of high efficiency clothes washers through their Program literature. Distributors stated they were already very aware of the benefits.
2. Those who see the information believe the potential savings indicated in the Program literature. In addition, customers seem to place more value on water savings than energy savings.
3. The installation of high efficiency clothes washers appears to be due more to the rebate than simply the belief in the provided information.
4. The Program has a positive impact on participating customers' current attitudes towards energy efficiency.
5. The likelihood of installation of high efficiency clothes washers in the future appears to be more a function of possible rebate level than acceptance of the information provided.

6. While the reduction in the water bill was most noticeable to customers, some customers also reported noticeable reductions in electric and gas bills.
7. There seemed to be little attempt at renegotiation of the route operator contracts. However, the few times renegotiation was requested, it resulted in changes in contract terms.

Seen together, these conclusions paint a picture of a washer program component that positively affects customer awareness and attitudes, but of an installation environment that is still dependent on rebates to make many installations occur.

Lighting Component. The findings from the lighting component market indicator assessment are:

1. The program is well marketed and successfully addressed the target market. It appears to also pull in small retail stores.
2. The washer component of the Program created synergy with lighting installations.
3. The Program appears to cause energy efficient lighting installations that would not otherwise have occurred.
4. Most customers who looked at their bill closely enough to observe a change saw a small or medium size reduction in their electric bills after installation of energy efficient lighting.
5. Customers who saw a reduction in their bills state they are more likely to install energy efficient lighting sometime in the future when a similar monetary incentive is available. However, when the incentive is half the current amount or absent there is no difference in stated potential future actions between those who saw a reduction in their bills and those who did not.
6. The program improved customers' attitudes towards energy efficiency in general, at least in terms of their stated attitudes.

Overall, the lighting component succeeded in affecting the market actors it set out to influence. It appears to have achieved installation of lighting in markets that otherwise would not have installed efficient lighting. While the program has influenced the attitudes of participants concerning energy efficiency, it appears that those participants still require incentives to make future installations. (It should be noted that it was never the goal of the program to transform this market.)

6.1.3 Overall Findings

The LightWash program was found to be well run and successful. It exceeded the program target impact goals, ran a solidly documented program, marketed the program well, and affected the market actors it set out to influence.

The obvious success of the program and the need in the market call for the continuation of this program.

6.2 Recommendations

Given the positive evaluations finding presented above, the evaluation team has the following recommendations:

6.2.1 Program Recommendations:

1. The program database should either create a combined database for the two program components or make concerted efforts to cross reference participation by a single entity in both program elements. This would (1) allow possible cross marketing more feasible and (2) would facilitate efforts to evaluate the program.
2. Most of the lighting was installed by one lighting contractor. The program should assess why this occurred and attempt to diversify the lighting installation sources. Diversification reduces program reliance on one contractor and assures that the limitations of the contractor's staff or service area do not limit the program success.
3. While the lighting element was successful, program managers may want to revisit whether the washer element offers a ready-made avenue to marketing the lighting program element. There were very few sites where both washers and lighting installations occurred.

6.2.2 Evaluation Recommendations

1. When attempting to assess the number of cycles per day for washing machines, self-report data continues to appear unreliable. The evaluators recommend collecting monitored data in future evaluations.
2. The evaluators should work with the program managers from the beginning of the program to establish better methods for documenting the contact information and level of participation of trade allies. This would be in the interest of both the program and the final evaluation effort.

This completes the evaluation report of the PY2002/2003 LightWash program. Appendices follow.

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B. ENGINEERING REVIEW OF LIGHTWASH ALGORITHMS USED FOR DEEMED SAVINGS

Overview

One of the tasks Equipoise Consulting Inc. (Equipoise) performed in the LightWash program evaluation was an engineering review of the algorithms used for the deemed savings values calculation. Exhibit 1 indicates the deemed savings values outlined in the response to an Equipoise data request for clothes washers and as outlined in the RFP for lighting. The clothes washer impact values were based on a California Energy Commission document (CEC, 2001). Energy Solutions had proposed a more detailed approach to calculating washer impacts in their program proposal, but moved to the CEC values in their implementation plan as the CEC numbers were within an agreed upon state document. The deemed savings values shown in Exhibit 1 have been agreed to by the California Public Utilities Commission, Energy Division (CPUC, ED).

Exhibit 1
Ex Ante Deemed Savings Values

Measure	Unit	Annual Energy Impact per Unit (kWh)	Peak Demand Reduction per Unit (kW)	Annual Therm Impact per Unit
Clothes Washers	Washer	340	0.058	70
Lighting Retrofit	kW	6,636	1.0	NA

Method

Clothes Washers - Equipoise requested data from Energy Solutions on 2/26/03. The response to this data request was provided on 3/10/03. Subsequent review of the response generated a further request by Equipoise for the Excel spreadsheet that determined the clothes washers estimated impact. This was provided to Equipoise in a timely manner. While the spreadsheet had much information regarding the market breakdown for clothes washers, this portion of the spreadsheet was not reviewed. Only the section that documented the per unit energy impacts was assessed. Studies indicated in the reference section of this document were used to provide validity to the assumptions Energy Solutions used in the deemed savings calculations.

Following the engineering review of the creation of the deemed savings values, the Access database containing the data and queries that create the program savings were reviewed. This review occurred on July 7, 2003.

Equipoise researched the energy savings resulting from pumping less water upstream and downstream of the clothes washers through an extensive Internet search. Data on water use throughout the state was obtained from the Department of Water Resources and telephone calls were made to the California Energy Commission to determine energy use from pumping water.

Lighting – Equipoise reviewed the connected load reductions, hours of operation, coincident diversity factor, and interactive demand effects provided in the data request response. Again, sources used to validate the assumptions are listed in the references section.

Following the engineering review of the creation of the deemed savings values, the Access database containing the data, and queries that create the program savings were reviewed. This review occurred on July 7, 2003.

Results

Clothes Washers – The assumptions used in the calculation of energy impacts per turn (i.e. per use of the clothes washer) were found to be sound, if not a bit conservative. The overall deemed savings numbers indicated in Exhibit 1 are a function of the number of washers installed in various locations and the assumed number of turns per day of those washers. For example, multi-family common area clothes washers were assumed to be used three to four times a day while Laundromat washers were assumed to be used six times a day. Using the number installed at the various locations as provided in the spreadsheet, the average annual deemed electrical energy savings was 300 kWh per unit. However, while this value is different from the 340 kWh shown in Exhibit 1, this may be misleading as the ultimate impact from the program may be determined based on the actual number of units installed within each type of location. Exhibit 2 shows the three distinct groupings of use per day.

Exhibit 2
Turns per Day by Location of Washer

Location	Turns per Day	kWh Impact
Washers in multi-unit facilities with 9 or less units per site	3	248
Washers in multi-unit facilities with greater than 10 units per site	4	330
Laundromats and Institutional Sites	6	495

The review of the Access database indicated that the program level deemed savings were being applied to the per-unit savings, regardless of location. It is recommended that the program implement the per unit impacts based on the location of the installations (i.e., the number of turns per day) to assure that the most accurate estimate of impacts results. This could be done by adjusting how the program estimates impacts within the database or by adjusting the per-unit impact to reflect the final population of washers by location at the end of the program.

Energy Solutions is not including potential energy impacts that result from the reduced amount of water required to go through pumps at the supply and wastewater system level. Equipoise researched this issue and determined that there are savings to the grid seen by the decreased water use pumping load. Equipoise calculated a kWh/gallon value for pumping using data from *Water Energy Use in California* (2003). However, the best information on this issue was

provided by Shadid Chaudhry of the California Energy Commission (CEC). He provided a document that showed the pumping energy use in Exhibit 3. (Carns, 2001) The values calculated from these two sources were similar in magnitude, with the Carns values being smaller. [6]

Another source of information was a CEC document in 1993. This document indicated that energy use fell by up to 20% if the amount of waste water was reduced by 50%. (The savings were due to lower pumping requirements.) Because this indicated a non-linear relationship between the waste water pumping in the wastewater treatment plant and the water going through the plant, we applied a 40% reduction in the energy use for pumping in the wastewater treatment plant shown in Exhibit 3.

The energy use for the upstream and downstream pumping could be applied to the gallons of water saved by the clothes washer. Inclusion of this value would increase the per machine annual electrical savings by 12%, there would be no influence on the therm savings. It is acknowledged that this impact would be virtually impossible to prove and would have to be accepted as based on the Carns and CEC reference along with engineering estimates.

Exhibit 3
Energy Use for Pumping

Pumping Activity	**kWh / Million Gallons**	**Percent of energy use used in analysis**
Raw water pumping	350	100
Pumping in the distribution system	1,150	100
Pumping to the wastewater treatment plant	150	100
Energy use in the wastewater treatment plant	1,050	40
Total for impact from clothes washers (kWh/Million Gallons)	**2,070**	

The LightWash peak demand impact value of 0.058 per unit was taken from the CEC peak reduction value (Table 13B from CEC 2001). This value appears reasonable based on the kWh impact for a single use of the washer (0.190 kWh per turn) and assumptions regarding length of time the washer is run in an hour (40 minutes) and number of washers in use during the CPUC peak period of noon to 7 PM (45%).

[6] The "*Water*" document references calculated a value of 0.00317 kWh/gallon while the Carns provided a value of 0.00235 kWh/gallon.

The therm per unit savings are based on the electric savings for water heating and reduction in dryer use. The savings are then converted from electricity to natural gas. The conversion calculation takes into account the percent of natural gas dryers[7] and natural gas water heaters[8] found in the state. The assumptions that went into the determination of therm savings per washer are viewed as reasonable.

Lighting – There was no actual evaluation of the assumptions used for the connected load reductions as these impacts are based on PG&E values (Pacific Gas and Electric, 2000) with a few connected load reductions based on calculations provided within the response to the data request. It is tacitly assumed that since PG&E has been conducting lighting evaluations since 1992 that the evaluation corrections have been incorporated into these program values. The multipliers (i.e., the coincident diversity factor, deemed hours, interactive kW demand effects[9], and interactive kWh energy effects) were double checked against the values in the PG&E workpapers. There was one very minor discrepancy that was brought to the attention of Energy Solutions (there was a 0.03 difference between the demand interactive effects with the deemed value shown to be 1.16 while the PG&E value was 1.19). As detailed in the Program Implementation Plan (PIP), Energy Solutions plans to apply interactive effects only to areas with "significant air conditioning". As there were no installations within this type of area at the time of the review, all current lighting installations had no interactive effects applied so this was not an issue for the current impacts. Applying interactive effects only by area and not by specific site is somewhat conservative, but Equipoise agrees with how the interactive effects are currently applied.

Each of the connected load reduction values were checked against the PG&E values with only one very slight difference found. (A 1 watt per lamp impact difference between the PG&E value and the information in the deemed savings value for a fixture that had not been installed through the program at the time of the review.) Additionally, it was pointed out to Energy Solutions that four of the values in the PG&E connected load reductions were per fixture, not per lamp. As the fixtures to which these values applied had no installations at the time of the review, it made no difference to any impacts. Energy Solutions plans to correct this value in the database so any future estimates will be correct. In addition, the review identified two fixture types not included in the PG&E values that were found to have questionable connected load reductions (Premium 4 foot T8 with Electronic Ballast from 8 foot HO T12 with Energy Saving Ballast and Premium 4 foot T8 with HO Electronic Ballast from 8 foot HO T12 with Energy Saving Ballast). These were pointed out to Energy Solutions and they will be handled appropriately.

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[7] *Statewide Survey of Multi-Family Common Area/Building Owners Market.* Final Report, Volume 1. June 2000. Page 5-5.

[8] IBID, Page 5-10.

[9] The term "interactive effect" refers to the savings in air-conditioning load due to the reduction in the amount of heat emitted by the lighting into the air-conditioned space when more efficient lighting is installed.

The program calculates the demand impacts using the connected loads and a coincident diversity factor. To calculate energy impacts, each kW calculated from the actual lights installed is divided by the coincident diversity factor for Laundromats (as this is not included in energy) and then multiplied by the Laundromat hours of operation value. The final kWh impact is calculated as shown in Equation 1 and Equation 2 below.

$$\text{kWh Impact} = \frac{5{,}840\ (\text{Laundromat Hours})}{0.88\ (\text{Laundromat CDF})} * \text{kW Impact} \quad (1)$$

$$\text{kWh Impact} = 6{,}636\ \text{Hours} * \text{kW Impact} \quad (2)$$

However, while the kWh impact as calculated in Equation 2 will be the value indicated in the quarterly reports, it will not be the final kWh impact for the program. The following is an excerpt from an email from Energy Solutions to PG&E:

> "Internally, we plan to use generally accepted, but lower numbers for lighting projects done on "adjacent businesses" because such lower numbers are more realistic. However, I think we are going to have to report it to you in the workbook on the basis of Laundromat hours because that is all we filed and that is what is wired into the workbook now. We can't keep modulating the number each month when there is a different weighted average hours of use assumption in the workbook because it would mess up the historical calculations. Thus, our external reporting will show lighting savings based on only one approved hours of use assumption, and will be slightly over what we really believe they are. I don't think it will amount to much…" (excerpt from 6/10/03 email to Laura Mann of PG&E)

The evaluation team will use the hours of operation by business type to obtain the final kWh values for the lighting component of LightWash for the draft & final report.

The structure of the database and the queries used to calculate program savings based on the connected loads were reviewed with no discrepancies found.

Conclusions

The deemed savings for washers and lighting within the LightWash program are correctly applied within the database. The savings tend to be slightly conservative for washers.

Based on how the program deemed savings values have potential for change, the evaluation team makes the following recommendations:

- All changes should be applied during the evaluation report. LightWash should continue to provide impacts based on the deemed savings from Exhibit 1 for all reporting to the CPUC, ED.
- The program should apply washer savings based on the location of the washer to obtain impacts based on the actual washers installed and not the proportion of washers estimated at the beginning of the program. As stated in the first bullet point, this would be applied by the evaluation team in the EM&V report.

- Energy Solutions should consider discussing the inclusion of upstream & downstream pumping impacts due to the clothes washer installations with the CPUC. As stated in the first bullet point, any changes here would be applied by the evaluation team in the EM&V report.

C. QUARTERLY VERIFICATION REVIEWS

April 22, 2003

To: Ted Pope, Energy Solutions

From: Tim Caulfield, Equipoise Consulting Incorporated

Re: Program Initiation to Date, Data Assessment
LightWash Washers Database

This memorandum summarizes Equipoise Consulting's (Equipoise) review of specific tables requested from the LightWash washer portion of Energy Solutions (ES) database. This data assessment is intended to serve two functions. First, it forms a validation of ES's progress toward attaining it's program goals. Second, it allows Equipoise to review the data to assure itself that the data needed for the eventual project evaluation is being collected and entered into the program database. The latter assessment also allows Equipoise to identify, for ES's benefit, areas of the database that may require attention.

For the washer portion of the data assessment, Equipoise requested and reviewed the database tables named "project" and "washer". ES supplied records for all projects from program inception to the end of the first quarter 2003. The variables from these two tables were merged and imported into Excel for easy review. The data was assessed for completeness by computing the percent of the cells that were populated and visually reviewing the cell content.

The results of this assessment are presented in Exhibit 1 below. The data review indicates that ES has, for the first quarter of 2003, accrued the installation of 171 projects representing 947 washing machines of various make and model. Due to a miscommunication, ES supplied only data for the first quarter 2003. When this was realized, late in the process, ES sent information saying that they had completed an additional 10 projects representing 134 washers during the fourth quarter 2002. This means that a total of 181 projects representing 1,081 washers have been accrued through the end of the first quarter by the LightWash program. Since the information on the fourth quarter was received after the analysis was completed, the data for this period will be reviewed during the second quarter 2003 review. We use the word accrued because these projects are entered into the database and have been "booked" against first quarter accomplishments, but Equipoise has no first hand information on the state of completion. In fact, in some cases, the data indicate that while the project may be complete, the accounting or data entry may still be being completed.

Data Review

Exhibit 1 lists the variable name from the database, Equipoise's understanding of that variable, the total number of cells that contain data, the percentage of cells containing data, a subjective indicator of the importance of the data for both program and evaluation purposes, and subjective comments on the data populating the cells for each variable. An importance level of one (1) indicates that we feel that correct population of these cells is key to either evaluating the project or to documenting the program impacts. An importance level of two (2) indicates that these cells could be key to evaluating or documenting the program, but that it is impossible to tell based on the population of the database whether the cells in the database should be populated.

We have only commented on the variables with an importance indicator of 1 or 2. While the other variables may be important to the operation of the program they are not key to evaluation or program impact documentation.

In general the database showed high levels of cell population. Variables that have missing data have been commented on. For one variable the comments have been **bolded** to indicate that it is important to address these apparent deficiencies in data entry. While we believe these are data deficiencies, it is possible that the actual data resides in another table that we were not aware of. In one instance (install date) there appear to be duplicate variables, one in each table, and neither is completely populated.

It is our hope that this review process helps in improving the integrity of the database.

We have randomly chosen 10 projects for file review. I will call to set up a date to come and review these files.

Summary – All data indicates that Energy Solutions has, from the start of the program to the end of the first quarter, accrued 181 projects representing 1,081 washing machines of various make and model. The database appears to be well populated, with some variables needing cleaning up or some needing populating.

Exhibit 1 – Variable Populations and Comments

Variable Name	Assumed Meaning	No. Points	% Filled	Importand	Comment
Project Number	Project Identification Variable	171	100%	1	OK
B Name	Business Name	159	93%	1	OK. Some locations don't have Company Name.
C Name	Customer Name	171	100%	1	OK
Phone	Customer Phone Number	171	100%	1	OK
Phone Ext	Customer Extention	16	9%		
Fax	Customer Fax Number	132	77%		
M Address	Mailing Address	71	42%		
M Address2	Mailing Address Aux Field	0	0%		
M City	Mailing Address City	71	42%		
M State	Mailing Address State	171	100%		
M Zip	Mailing Address Zip	69	40%		
Same As	Install address same as Mail adress	171	100%		
I Address	Installation Address	171	100%	1	OK
I Address2	Installation Address Aux Field	0	0%		
I City	Installation City	171	100%	1	OK
Install Zip	Installation Zip Code	171	100%	1	OK
Tax ID	Participant Tax ID	63	37%		
Market Sector	Market Sector	171	100%	1	OK
W Utility	Water Utility	171	100%	1	OK
W Account	Water Utility Account No.	170	99%		
W Rate	Water Utility Rate Code	0	0%		
G Utility	Gas Utility	170	99%		
G Account	Gas Utility Account No.	167	98%		
G Rate	Gas Utility Rate Code	1	1%		
E Utility	Electric Utility	69	40%		One contractor not collecting electric utility data, not crucial since info only used in conjunction with other utility information to qualify customers
E Account	Electric Utility Acct. No.	69	40%		One contractor not collecting electric utility data, not crucial since info only used in conjunction with other utility information to qualify customers
Washer Part	Participant in Washer Prog?	171	100%	1	
Lighting Part	Participant in Lighting Prog?	171	100%	1	

Exhibit 1 – Variable Populations and Comments (Continued)

Variable Name	Assumed Meaning	No. Points	% Filled	Importanc	Comment
Status	?	171	100%	1	All are coded as code "5" which indicates customers paid.
Total Incentive Amount	Total Incentive Amount	170	99%	1	Currently a redundant field
Energy Incentive Amount	Energy Incentive Amount	171	100%	1	Project 165 has check number but shows zero for check amount.
Water Incentive Amount	Water Incentive Amount	171	100%	1	Some portion of population zero.
Energy Check Number	Energy Check Number	171	100%	1	OK
Water Check Number	Water Check Number	170	99%	1	Currently a redundant field since incentives all paid in one check.
Incentive Check Date	Incentive Check Date	171	100%	1	OK
Incentive Check Date2	Incentive Check Date 2nd Check	1	1%	2	Appears OK due to phasing.
Incentive	Incentive Amount	171	100%	1	OK
Incentive2	2nd Incentive Amount	90	53%	2	Assume OK due to phasing.
Received Date	Partner received date	120	70%		
Customer Phone2	Alternate Customer Phn No.	39	23%		
Phone2 Ext	Alternate Customer Extention	0	0%		
email address	Customer Email Address	48	28%		
DMC .	DMC Internal Tracking Number	100	58%	1	Don't know what variable means.
Inspection	Inspection:Required or not	128	75%	1	**Should be 100% populated.**
Install Date	Installation Date	171	100%		OK
Payee	Payee name on Check	71	42%		For ES internal use
ES Received	Date ES received hard copy	139	81%		For ES internal use
Ownership	Business leases or purchases washer	71	42%		For ES internal use
Marketing	How learned about lightwash	60	35%		For ES internal use
Vendor	Vendor name	70	41%		For ES internal use
Reserved Amount	Funds reserved for customer	1	1%		For ES internal use
Reservation Date	When funds reserved	0	0%		For ES internal use
Status Date	Last time the status was changed	21	12%		For ES internal use
From Washer EMV Q1					
Project Number	Project Identification Variable	171	100%	1	OK
Model	Model No. for installed washer	171	100%	1	OK
Quantity	Quantity of washers installed	171	100%	1	OK
Installation Date	Redundant field	137	80%	1	Redundant field

April 24, 2003

To: Ted Pope, Energy Solutions
Bruce Chamberlain, Energy Solutions

From: Tim Caulfield, Equipoise Consulting Incorporated

Re: Program Initiation to Date, Data Assessment
LightWash Lighting Database

This memorandum summarizes Equipoise Consulting's (Equipoise) review of specific tables requested from the LightWash lighting portion of Energy Solutions (ES) database. This data assessment is intended to serve two functions. First, it forms a validation of ES's progress toward attaining its program goals. Second, it allows Equipoise to review the data to assure itself that the data needed for the eventual project evaluation is being collected and entered into the program database. The latter assessment also allows Equipoise to identify, for ES's benefit, areas of the database that may require attention.

For the lighting portion of the data assessment, Equipoise requested and reviewed the database tables named "BBP_Prj_Inf_Header", BBP_Cust_Inf" and "BBP_Prj_Fixt_Details". ES supplied records for all projects from program inception to the end of the first quarter 2003. The variables from these three tables were merged and imported into Excel for easy review. The data was cleaned and assessed for completeness by computing the percent of the cells that were populated and visually reviewing the cell content.

The results of this assessment are presented in Exhibit 1 below. The data review indicates that ES has, by the end of the first quarter of 2003, accrued the installation of 9 projects representing 232 fixtures of various model types. We use the word accrued because these projects are entered into the database and have been "booked" against first quarter accomplishments, but Equipoise has no first hand information on the state of completion at this point.

Data Review

Exhibit 1 lists the variable name from the database for the fixtures table, Equipoise's understanding of that variable, the total number of cells that contain data, the percentage of cells containing data, a subjective indicator of the importance of the data for both

program and evaluation purposes, and subjective comments on the data populating the cells for each variable. An importance level of one (1) indicates that we feel that correct population of these cells is key to either evaluating the project or to documenting the program impacts.

In order to understand the fixture table, and how it interacted with other database tables, Equipoise sat down and discussed the table and database with the ES staff responsible for the database. Exhibit 1 represents a cleaned version of the fixture table, allowing easy computation of the number of projects and fixtures installed. Overall there were 9 projects completed, with 23 separate fixture installation groups, representing a total of 232 fixtures installed by the end of the first quarter. While each fixture represents an improvement in efficiency on a lamp-for-lamp basis, the change-outs also represent the removal of 181 lamps of varying wattages from service.

This table showed a high level of cell population. Several erroneous data entries were identified and passed on to the ES database manager.

The second two tables reviewed were combined for ease of review and the summaries are presented in Exhibit 2. This exhibit summarizes all data used to track customer data and the progress of their participation in the program. The table shows 100% cell population for all of the key variables needed for program documentation and evaluation. Some notes have been added in the comments column for ES review and information. None appear to be critical.

It is our hope that this review process helps in improving the integrity of the database.

We have randomly chosen 10 projects for file review. I will call to set up a date to come and review these files.

Summary – All data indicates that Energy Solutions has, from the start of the program to the end of the first quarter, accrued 9 projects, with 23 separate installation projects, representing 232 fixture replacement of various types and 181 lamp removals of various wattages. The database appears to be well populated, with a minimum number of cells needing cleaning.

Exhibit 1 – Variable Populations and Comments for Fixture Table

Variable Name	Assumed Meaning	No. Points	% Filled	Importanc	Comments
CustomerId	Unique Customer Variable	23	100%	1	OK
ProjectNumber	Unique Project Variable	23	100%	1	OK
WorkOrderNumber	Work Order Number	23	100%	1	OK
ExistingMeasureCodenDesc	Existing Measure Code/Description	23	100%	1	OK
ExistingMeasureQty	No. of Existing Measures	23	100%	1	OK
ExistingMeasureComts	Existing Measure Comments	22	96%		OK
RecomdMeasureCodenDesc	Recommended Measure Code/Description	23	100%	1	OK
RecomdMeasureQty	No. of Recommended Measures	23	100%	1	OK
RecomdMeasureComts	Recommended Measure Comments	23	100%	1	Useful
ExistLightOperationHrs	Operating Hrs. for Existing Fixtures	23	100%	1	OK
ExistLightFixtureWatts	Watts/fixture for existing fixtures	23	100%	1	OK
RecomdLightFixtWatts	Watts/fixture for recommended fixtures	23	100%	1	OK
RecomdLightOperationHrs	Operating Hrs. for post retrofit	23	100%	1	Hours of Operation for Customer ID 102 project 1 doesn't match pre hours.
ExistLightLocation	Location of existing lighting fixures	0	0%	1	Covered by RecommdLightLocation
AvgElectricRate	Average electric rate	23	100%	1	All average electric rates default to $0.18
RecomdLightLocation	Location of recommended fixtures	23	100%	1	OK
Ext_Remd_Link_No	Links to other tables	23	100%	1	OK
BF_Selection	Links to other tables	23	100%	1	OK

Exhibit 2 – Variable Populations and Comments – Lighting Customer Tables

Variable Name	Assumed Meaning	No. Points	% Filled	Importance	Comments
BBP_Prj_Inf					
CustomerId	Unique Customer Variable	9	100%	1	
ProjectNumber	Unique Project Variable	9	100%	1	
VendorName	Vendor Name	9	100%	1	
GroupNumber	?	9	100%		
ParticipantStatus	Participant Paid or not Paid	9	100%		
PreFieldInspectionDate	Data of Pre-Field Inspection	9	100%		
PreFieldInspector	Name of Inspector for Pre-Inspection	9	100%		
PostFieldInspectionDate	Data of Post-Field Inspection	9	100%		
PostFieldInspector	Name of Inspector for Post-Inspection	9	100%		
Access Agreemenet Received	Date Access Agreemenet Received	9	100%		
Appointment Date	Appointment date for ????	0	0%		
Scheduled For	Person Scheduled to ???	9	100%		
Appointment Time	Time of Appointment for ???	0	0%		
PostFieldInspectionStatus2	Status of Post-Field Inspection	9	100%		
CouponNumber	Coupon Number	9	100%		
TotalIncentiveAmt	Total Incentive Amount	9	100%		
CustomerCostShare	Customer Share of Cost	9	100%		Populated with zeros
IOUIncentiveAmt	IOU Incentive Amount	9	100%		
WaterIncentiveAmt	Water Utility Incentive Amount	9	100%		Populated with zeros
IOUCheckNumber	IOU Check Number	9	100%		Only 2 check numbers despite diverse customers?
WaterCheckNumber	Water Utility Check Number	9	100%		Populated with zeros
IncentiveCheckDate	Date of First Incentive Check	9	100%		
IncentiveCheckDate2	Date of Second Incentive Check	0	0%		
ReceivedDate	Date ??? Received	3	33%		
BBP_Cust_Inf					
CustomerId	Unique Customer Variable	9	100%	1	
Company	Business Name	9	100%	1	

Exhibit 2 – Variable Populations and Comments – Lighting Customer Tables (Continued)

Variable Name	Assumed Meaning	No. Points	% Filled	Importance	Comments
BBP_Prj_Inf					
ContactName	Contact Name	9	100%	1	
PhoneNumber	Contact Phone Number	9	100%	1	
Store Phone	Installation location? phone number	4	44%		
Cell Phone	Contact Cell Phone Number	3	33%		
Fax	Contact Fax Number	4	44%		
MultiFamilyProperty	Indicator whether Multifamily	9	100%		
Under100kW	Indicator whether less than 100 kW	9	100%		
Under10people	Indicator whether less than 10 people	9	100%		
TenantOccupied	Indicator whether property tenant occu	9	100%		
LangPreference	Indicator whether there is a language	9	100%		
BusSqrFootage	Number of Square feet being retrofit	9	100%	1	35% populated with zeros
MAddress	Mailing Address	9	100%	1	
MAddress2	Mailing Address Aux Field	0	0%		
MCity	Mailing Address City	9	100%	1	
MZip	Mailing Address Zip	8	89%	1	
SameAs	Installation address same as Mail Add	7	78%		
IAddress	Installation Address	9	100%	1	
ICity	Installation City	9	100%	1	
IZip	Installation Zip Code	6	67%	1	
TaxId	Customer Tax ID	0	0%		
MarketSector	Market Sector of Business	9	100%		
WUtility	Water Utility	0	0%		Not relevant fields
WAccount	Water Utility Account No.	0	0%		Not relevant fields
WRate	Water Utility Rate Code	0	0%		Not relevant fields
GUtility	Gas Utility	0	0%		Not relevant fields
GAccount	Gas Utility Account No.	0	0%		Not relevant fields
EUtility	Electric Utility	9	100%	1	
EAccount	Electric Utility Acct. No.	9	100%	1	
ERate	Electric Rate Code	9	100%	1	
WasherParticipant	Participant in Washer Prog Indicator	0	0%		
LightingParticipant	Participant in Lighting Prog Indicator	0	0%		
Cross Street	Nearest cross street to installation loc	1	11%		
Scheduling Comment	Scheduling Comment	0	0%		
Appointment Date	Appointment Date for ???	1	11%		
Appointment time	Appointment time for ???	0	0%		

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July 28, 2003

MEMO

To: Ted Pope & Bruce Chamberlain, Energy Solutions

From: Mary Sutter, Equipoise Consulting Inc.

Re: 2nd Quarter 2003 Verification – Updated Memo

This memo has been updated to reflect small changes from the memo provided on 7/17/03. Formatting has been slightly changed and a few items within Exhibits 3 and 5 were changed to more accurately reflect the variable.

This memorandum summarizes Equipoise Consulting's (Equipoise) review of specific tables requested from the LightWash Energy Solutions (ES) database. This data assessment is intended to serve two functions. First, it forms a validation of ES's progress toward attaining its program goals. Second, it allows Equipoise to review the data to assure itself that the data needed for the eventual project evaluation is being collected and entered into the program database. The latter assessment also allows Equipoise to identify, for ES's benefit, areas of the database that may require attention.

This document covers the two components of the LightWash program. Each component used a sample of the population for verification purposes. The calculation of the sample size is presented first, followed by the method used in the verification, and then the results of the washer component and the lighting component verification.

Sample Size Determination

Equipoise pulled a sample of records for verification purposes. The sample was pulled using the following assumptions:

- Results of verification would be accurate at the 95th percentile,
- Expected percent of valid occurrences in the population set to 90% (conservative value), and
- Finite population correction factor is used.

The following algorithms were used to calculate the sample:

$$nsample = \frac{t^2 * p * (1 - p)}{d^2} \qquad (1)$$

$$nfinite = \frac{nsample}{\left(1 + \frac{nsample}{N}\right)} \quad (2)$$

where:

t	=	1.645 (95% confidence level for a one-tailed t-test with infinite degrees of freedom)
p	=	expected percent of valid occurrences in the population (0.9)
d	=	desired level of accuracy (0.05)
N	=	population size
nsample	=	required sample size without the finite population correction
nfinite	=	required sample with finite population correction

Verification Method

All records in project-specific (for washers) or customer-project-specific (for lighting) tables were provided a random value. The records in this main table that fell into the sample frame as determined by the finite population correction value were verified. For tables linked to the main table, only those projects or customer-projects that were linked to records selected in the main table sample were verified.

For the sampled records, Equipoise assessed the total number of cells within each table that contained data, provided a subjective indicator of the importance of the data for both program and evaluation purposes, and subjective comments on the data populating the cells for each variable. An importance level of one (1) indicates that we feel that correct population of these cells is key to either evaluating the project or to documenting the program impacts. An importance level of two (2) indicates that these cells could be key to evaluating or documenting the program, but that it is impossible to tell based on the population of the database whether the cells in the database should be populated. An importance level of three (3) is a variable that we consider to be irrelevant for evaluating the program or documenting the program impacts.

Once the electronic verification of the data was completed, ten projects or customer-project records from the sampled group were randomly selected for visual verification of hardcopy data. The hardcopy data that was visually verified was the copy of the application with the customer signature and a copy of the check cut to the participant. In the case of washers paid by the Santa Clara Water District, the copy of the check cut will not be available to ES until the end of the year. Equipoise will need to go back and visually verify those checks at that time.

Washer Component Results

For the washer portion of the data assessment, Equipoise reviewed the database tables named "1PROJECT" and "1WASHER". ES supplied records for projects from the 4th quarter of 2002 and

the 2nd quarter of 2003. The 1st quarter 2003 was previously verified and covered in a memo from Equipoise dated 4/24/03 for the washer component.

Exhibit 1
Results for 2nd Quarter Verification

Population (Records)	Sample Size (Records)	Percent of Records Verified	Washers in Sample	Washers in Population
199	65	100%	331	1,073

Exhibit 2
Estimated Impacts for Washers in 2nd Quarter Verification

Paper Verified Washers in Population	Deemed kWh/Washer	Deemed kW / Washer	Deemed Therms / Washer	kWh	kW	Therms
1,073	340	0.058	70	364,820	62.2	75,110

Verification of hard copy data was performed on 7/17/03. Because the first quarter verification had not done this step, 10 participants were randomly chosen from the first quarter data as well as 10 from the sample size of 65 from the second quarter data. (Remember that the second quarter data included the fourth quarter of 2002 data as well as second quarter 2003 data.) This verification of hard copy indicated no problems. There were two projects from the Santa Clara Water District that will require Equipoise to visually verify the check copy at a later date (IDs 161 and 365).

In general the database showed high levels of cell population. Variables that have missing data have been commented on.

This memo provides a paper verification of the program installations to date only. Equipoise will go into the field during the first quarter of 2004 to visually verify the existence of the washers. A final realization rate on the number of washers in the population will be developed and reported in the final evaluation report.

Exhibit 3 – Washer Variables and Comments

Washer Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
1PROJECT_TABLE					
Project Number	Project Identification Number	65	100%	1	
B Name	Business Name	55	85%	1	OK, not all customers have a business name
C Name	Customer Name	65	100%	1	
Phone	Customer Phone Number	65	100%	1	
Phone Ext	Customer Extension	2	3%	3	
Fax	Customer Fax Number	47	72%	3	
M Address	Mailing Address	27	42%	3	
M Address2	Mailing Address Aux Field	0	0%	3	
M City	Mailing Address City	27	42%	3	
M State	Mailing Address State	65	100%	3	
M Zip	Mailing Address Zip	27	42%	3	
Same As	Install address same as Mail address	65	100%	3	
I Address	Installation Address	65	100%	1	
I Address2	Installation Address Aux Field	0	0%	3	

Washer Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
I City	Installation City	65	100%	1	
Install Zip	Installation Zip Code	65	100%	1	Note: while 100% filled in, 2 zip codes are zero and need actual values
Tax ID	Participant Tax ID	22	34%	3	
Market Sector	Market Sector	65	100%	1	
W Utility	Water Utility	65	100%	1	
W Account	Water Utility Account No.	65	100%	1	
W Rate	Water Utility Rate Code	0	0%	3	
G Utility	Gas Utility	65	100%	1	
G Account	Gas Utility Account No.	64	98%	1	Needs 1 gas account number (PG&E)
G Rate	Gas Utility Rate Code	0	0%	3	
E Utility	Electric Utility	65	100%	1	Note: while 100% filled in, not all have actual data as this is not provided at this time by water utility
E Account	Electric Utility Acct. No.	65	100%	1	Note: while 100% filled in, not all have actual data as this is not provided at this time by water utility
E Rate	Electric Utility Rate Code	0	0%	3	
Washer Part	Participant in Washer Program?	65	100%	1	While 100% filled in, some participants indicated as non-washer participants

Washer Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
Lighting Part	Participant in Lighting Program?	65	100%	2	
Status	Status of Project	65	100%	1	5 Indicates Paid - all set as 5
Total Incentive Amount	Total Incentive Amount	65	100%	2	Currently a redundant field
Energy Incentive Amount	Energy Incentive Amount	65	100%	1	
Water Incentive Amount	Water Incentive Amount	65	100%	1	
Energy Check Number	Energy Check Number	65	100%	1	
Water Check Number	Water Check Number	65	100%	2	Currently a redundant field since all paid with one check
Incentive Check Date	Incentive Check Date	65	100%	1	
Incentive Check Date2	Incentive Check Date 2nd Check	0	0%	2	
Incentive	Incentive Amount	65	100%	1	2 amounts do not equal expected total from energy incentive amounts and water incentive amounts
Incentive2	2nd Incentive Amount	65	100%	2	
Received Date	Date partner received	47	72%	2	

Washer Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
	application				
Customer Phone2	Alternate Customer Phone No.	27	42%	3	
Phone2 Ext	Alternate Customer Extension	0	0%	3	
email address	Customer Email Address	13	20%	3	
DMC .	DMC Internal Tracking Number	38	58%	3	
Inspection	Inspection :Required or not	65	100%	1	
Install Date	Installation Date	38	58%	1	This variable is redundant. Installation date is tracked in the washer table.
Payee	Payee name on Check	65	100%	3	For ES Internal Use
ES Received	Date ES received application from partner	65	100%	3	For ES Internal Use
Ownership	Business leases or purchases washer	21	32%	3	For ES Internal Use
Marketing	How learned about LightWash	18	28%	3	For ES Internal Use
Vendor	Vendor name	20	31%	3	For ES Internal Use
Reserved Amount	Funds reserved for customer	30	46%	3	For ES Internal Use
Reservation Date	When funds reserved	0	0%	3	For ES Internal Use
Status Date	Last time the status was changed	22	34%	3	For ES Internal Use

Washer Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
Model	Model No. for installed washer	65	100%	1	
Quantity	Quantity of washers installed	65	100%	1	
Install Date in Washer Table	Installation Date	51	78%	1	This should be 100% filled in. Appears to be a db structure issue that is being addressed by ES.

Lighting Component Results

For the lighting portion of the data assessment, Equipoise reviewed the database tables named "BBP_Prj_Inf_Header", BBP_Cust_Inf" and "BBP_Prj_Fixt_Details". The results of this assessment are presented in below in Exhibit 5. This table showed a high level of cell population with a few comments provided for specific variables.

Exhibit 4
Results for 2nd Quarter Verification

Population (Records)	Sample Size (Records)	Percent of Records Verified	Projects in Sample	Projects in Population
44	30	100%	30	44

Verification of hard copy data was performed on 7/17/03. Because the first quarter verification had not done this step, all 9 participants from the first quarter data as well as 10 randomly selected participants from the second quarter data were verified. This verification of hard copy indicated no problems. The data review indicates that ES installed 44 projects during the second quarter of 2003. The issue of independently calculating energy savings attributable to lighting project installation was assessed during this verification period. As ES provides the CPUC with lighting information on the kWh and kW reductions and not simply the number of projects, it appears that Equipoise should independently calculate these values. However, the appropriate table from the database was not requested for this to occur. It is recommended that this table be requested in the next quarter's verification and that lighting kWh and kW be calculated by Equipoise with this data.

As stated previously, this memo provides a paper verification of the program installations to date only. Equipoise will go into the field during the first quarter of 2004 to visually verify the existence of the installed lights. A final realization rate on the number of fixtures in the population will be developed and be incorporated in the final evaluation report.

Exhibit 5– Lighting Variables and Comments

Lighting Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
BBP_Cust_Inf_Q2					
CustomerId	Customer ID	30	100%	1	
Company	Company Name	30	100%	1	
ContactName	Contact Name	30	100%	1	
PhoneNumber	Contact Phone Number	30	100%	1	
Store Phone	Company Phone Number	3	10%	2	
Cell Phone	Contact Cell Phone Number	4	13%	2	
Fax	Contact Fax Number	2	7%	2	
MultiFamilyProperty	Y/N on multi family	30	100%	1	
Under100kW	Y/N on demand size of 100 kW	30	100%	1	
Under10people	Y/N on number of employees	30	100%	1	
TenantOccupied	Y/N on tenant occupied	30	100%	1	
LangPreference	Y/N on English as second language	30	100%	1	
BusSqrFootage	Square Footage of business	30	100%	2	Only 10% with values other than zero

Lighting Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
MAddress	Mailing Address	29	97%	2	
MAddress2	Mailing Address 2	0	0%	2	
MCity	Mailing City	29	97%	2	
MZip	Mailing Zip	29	97%	2	
SameAs	Y/N on Installation Address same as Mailing	28	93%	2	
IAddress	Installation Mailing Address	30	100%	1	
IAddress2	Installation Mailing Address 2	0	0%	2	
ICity	Installation City	30	100%	1	
IZip	Installation Zip	28	93%	1	Needs 2 zip codes
TaxId	Participant Tax ID	0	0%	2	
MarketSector	Market Sector	30	100%	1	
WUtility	Water Utility Name	30	100%	1	
WAccount	Water Utility Account	0	0%	3	Not a relevant field
WRate	Water Utility Rate	0	0%	3	Not a relevant field
GUtility	Gas Utility Name	0	0%	3	Not a relevant

Lighting Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
					field
GAccount	Gas Utility Account	0	0%	3	Not a relevant field
GRate	Gas Utility Rate	0	0%	3	Not a relevant field
EUtility	Electric Utility Name	30	100%	1	
EAccount	Electric Utility Account	30	100%	1	
ERate	Electric Utility Rate	29	97%	2	
WasherParticipant	Y/N on washer participation	0	0%	2	
LightingParticipant	Y/N on lighting participation	0	0%	3	Not a relevant field
Cross Street	Cross streets of installation	2	7%	3	For ES use
Scheduling Comment	Comments for scheduling	1	3%	3	For ES use
Appointment Date	Date of appointment	2	7%	3	For ES use
Appointment time	Time of appointment	1	3%	3	For ES use
BBP_Prj_Inf_Header_Q2					
CustomerId	Customer ID	30	100%	1	
ProjectNumber	Project Number	30	100%	1	
VendorName	Name of Installation Vendor	30	100%	2	

Lighting Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
GroupNumber	Group number	30	100%	2	One value is a zero
ParticipantStatus	Paid or not	30	100%	1	
PreFieldInspectionDate	Pre Inspection Date	30	100%	3	One data entry error (date in 01/2002)
PreFieldInspector	Pre Inspection Person	30	100%	3	
PostFieldInspectionDate	Post Inspection Date	30	100%	3	
PostFieldInspector	Post Inspection Person	30	100%	3	
Access Agreemenet Received	Date Access Agreement Received	30	100%	1	
Appointment Date	Date of appointment	1	3%	3	
Scheduled For	Person doing appointment	30	100%	3	
Appointment Time	Time of appointment	0	0%	3	
PostFieldInspectionStatus2	Status of Post Inspection	30	100%	3	
CouponNumber	Coupon Number	30	100%	3	Not a relevant field
TotalIncentiveAmt	Total Incentive Amount	30	100%	1	
CustomerCostShare	Amount Customer Pays	30	100%	2	

Lighting Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
IOUIncentiveAmt	PGC Incentive Amount	30	100%	1	
WaterIncentiveAmt	Incentive Amount from Water Utility	30	100%	3	
IOUCheckNumber	PGC Incentive Check Number	30	100%	1	
WaterCheckNumber	Incentive Check Number from Water Utility	30	100%	3	
IncentiveCheckDate	Incentive Check Date (First Check)	30	100%	1	
IncentiveCheckDate2	Incentive Check Date (Second Check)	0	0%	3	
ReceivedDate	Initial customer contact	30	100%	3	One data entry error (date in 11/2003)
BBP_Prj_Fixt_Details_Q2					
WorkOrderNumber	Work Order Number	166	100%	1	
ProjectNumber	Project Number	166	100%	1	
CustomerId	Customer ID	166	100%	1	
ExistingMeasureCodenDesc	Lighting Code of Existing Fixture	165	99%	1	OK - should have been "other"
ExistingMeasureQty	Existing Lamp Counts	166	100%	1	
ExistingMeasureComts	Existing Fixture Comments	87	52%	3	

Lighting Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
RecomdMeasureCodenDesc	Lighting Code of Recommended Fixture	166	100%	1	
RecomdMeasureQty	Recommended Lamp Counts	166	100%	1	
RecomdMeasureComts	Recommended Fixture Comments	158	95%	3	
PreTotalPowerSavings	Estimated kW impact pre installation	166	100%	2	All zeros
PostTotalNoOfMeasures	Post lamps installed	166	100%	2	All zeros
PostTotalNoOfSavings	Estimated kW impact post installation	166	100%	2	All zeros
PreTotalCostPerkW	Estimated cost/kW pre installation	166	100%	3	All zeros
PostTotalCostPerkW	Estimated cost/kW post installation	166	100%	3	All zeros
ExistLightOperationHrs	Existing Lighting Hours of Operation	166	100%	2	Not used
ExistLightFixtureWatts	Existing Lighting Connected Load (watts)	166	100%	2	Not used
RecomdLightFixtWatts	Recommended Lighting Connected Load (watts)	165	99%	2	Not used
RecomdLightOperationHrs	Recommend Lighting Hours of Operation	166	100%	2	Not used
ExistLightLocation	Existing Light Location (at site)	0	0%	2	

Lighting Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
AvgElectricRate	Average Electric Rate ($)	166	100%	3	
RecomdLightLocation	Recommended Lighting Location (at site)	166	100%	1	Could have a bit more specificity to allow for ease of finding the fixtures.
Ext_Remd_Link_No	Link to another table	166	100%	1	
BF_Selection	Link to another table	166	100%	1	

October 24, 2003

MEMO

To: Ted Pope & Bruce Chamberlain, Energy Solutions

From: Mary Sutter, Equipoise Consulting Inc.

Re: 3rd Quarter 2003 Verification

This memorandum summarizes Equipoise Consulting's (Equipoise) review of specific tables requested from the LightWash Energy Solutions (ES) database. This data assessment is intended to serve two functions. First, it forms a validation of ES's progress toward attaining its program goals. Second, it allows Equipoise to review the data to assure itself that the data needed for the eventual project evaluation is being collected and entered into the program database. The latter assessment also allows Equipoise to identify, for ES's benefit, areas of the database that may require attention.

Summary of Verification

Component	Unit	Original Units	Percent Verified	Verified Units
Washers	Washes Installed	1,603	100%	1,603
Lighting	Records in database	42	100%	42

This document covers the two components of the LightWash program. Each component used a sample of the population for verification purposes. The calculation of the sample size is presented first, followed by the method used in the verification, and then the results of the washer component and the lighting component verification.

Sample Size Determination

Equipoise pulled a sample of records for verification purposes. The sample was pulled using the following assumptions:

- Results of verification would be accurate at the 95th percentile,
- Expected percent of valid occurrences in the population set to 90% (conservative value), and
- Finite population correction factor is used.

The following algorithms were used to calculate the sample:

$$nsample = \frac{t^2 * p * (1 - p)}{d^2} \quad (1)$$

$$nfinite = \frac{nsample}{\left(1 + \frac{nsample}{N}\right)} \quad (2)$$

where:

t	=	1.645 (95% confidence level for a one-tailed t-test with infinite degrees of freedom)
p	=	expected percent of valid occurrences in the population (0.9)
d	=	desired level of accuracy (0.05)
N	=	population size
nsample	=	required sample size without the finite population correction
nfinite	=	required sample with finite population correction

Verification Method

All records in project-specific (for washers) or customer-project-specific (for lighting) tables were provided a random value. The records in this main table that fell into the sample frame as determined by the finite population correction value were verified. For tables linked to the main table, only those projects or customer-projects that were linked to records selected in the main table sample were verified.

For the sampled records, Equipoise assessed the total number of cells within each table that contained data, provided a subjective indicator of the importance of the data for both program and evaluation purposes, and subjective comments on the data populating the cells for each variable. An importance level of one (1) indicates that we feel that correct population of these cells is key to either evaluating the project or to documenting the program impacts. An importance level of two (2) indicates that these cells could be key to evaluating or documenting the program, but that it is impossible to tell based on the population of the database whether the cells in the database should be populated. An importance level of three (3) is a variable that we consider to be irrelevant for evaluating the program or documenting the program impacts.

Once the electronic verification of the data was completed, ten projects or customer-project records from the sampled group were randomly selected for visual verification of hardcopy data. The hardcopy data that was visually verified was the copy of the application with the customer signature and a copy of the check cut to the participant. In the case of washers paid by the Santa Clara Water District, the copy of the check cut will not be available to ES until the end of the year. Equipoise will need to go back and visually verify those checks at that time.

Washer Component Results

For the washer portion of the data assessment, Equipoise reviewed the database tables named "1PROJECT" and "1WASHER". ES supplied records for projects from the 3rd quarter of 2003.

Exhibit 1
Results for 3rd Quarter Verification

Population (Records)	Sample Size (Records)	Percent of Records Verified	Washers in Sample	Washers in Population
264	71	100%	613	1,603

Exhibit 2
Estimated Impacts for Washers in 3rd Quarter Verification

Paper Verified Washers in Population	Deemed kWh/Washer	Deemed kW / Washer	Deemed Therms / Washer	kWh	kW	Therms
1,603	340	0.058	70	545,020	93.0	112,210

Verification of hard copy data was performed on 10/16/03. This verification of hard copy indicated no problems. There was one project from the Santa Clara Water District that will require Equipoise to visually verify the check copy at a later date (ID664).

The database showed high levels of cell population. Variables that have missing data have been commented on.

This memo provides a paper verification of the program installations to date only. It is currently planned that Equipoise will go into the field during the first quarter of 2004 to visually verify the existence of the washers. A final realization rate on the number of washers in the population will be developed and reported in the final evaluation report.

Exhibit 3 – Washer Variables and Comments

Washer Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
Project Number	Project Identification Number	71	100%	1	
B Name	Business Name	67	94%	1	OK, not all customers have a business name
C Name	Customer Name	71	100%	1	
Phone	Customer Phone Number	71	100%	1	
Phone Ext	Customer Extention	3	4%	3	
Fax	Customer Fax Number	58	82%	3	
M Address	Mailing Address	29	41%	3	
M Address2	Mailing Address Aux Field	1	1%	3	
M City	Mailing Address City	29	41%	3	
M State	Mailing Address State	71	100%	3	
M Zip	Mailing Address Zip	29	41%	3	
Same As	Install address same as Mail adress	71	100%	3	
I Address	Installation Address	71	100%	1	
I Address2	Installation Address Aux Field	2	3%	3	
I City	Installation City	71	100%	1	
Install Zip	Installation Zip Code	71	100%	1	

Washer Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
Tax ID	Participant Tax ID	25	35%	3	
Market Sector	Market Sector	71	100%	1	
W Utility	Water Utility	71	100%	1	
W Account	Water Utility Account No.	71	100%	1	
W Rate	Water Utility Rate Code	0	0%	3	
G Utility	Gas Utility	71	100%	1	
G Account	Gas Utility Account No.	69	97%	1	Needs account numbers
G Rate	Gas Utility Rate Code	0	0%	3	
E Utility	Electric Utility	71	100%	1	Note: while 100% filled in, not all have actual data as this is not provided at this time by water utility
E Account	Electric Utility Acct. No.	71	100%	1	Note: while 100% filled in, not all have actual data as this is not provided at this time by water utility
E Rate	Electric Utiliity Rate Code	0	0%	3	
Washer Part	Participant in Washer Prog?	71	100%	1	
Lighting Part	Participant in Lighting Prog?	71	100%	2	
Status	Status of Project	71	100%	1	
Total Incentive Amount	Total Incentive Amount	71	100%	2	Currently a redundant field

Washer Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
Energy Incentive Amount	Energy Incentive Amount	71	100%	1	
Water Incentive Amount	Water Incentive Amount	71	100%	1	
Energy Check Number	Energy Check Number	71	100%	1	
Water Check Number	Water Check Number	71	100%	2	Currently a redundant field since all paid with one check
Incentive Check Date	Incentive Check Date	71	100%	1	
Incentive Check Date2	Incentive Check Date 2nd Check	0	0%	2	
Incentive	Incentive Amount	71	100%	1	
Incentive2	2nd Incentive Amount	71	100%	2	
Received Date	Date partner received application	44	62%	2	
Customer Phone2	Alternate Customer Phn No.	11	15%	3	
Phone2 Ext	Alternate Customer Extention	0	0%	3	
email address	Customer Email Address	14	20%	3	
DMC #	DMC Internal Tracking Number	42	59%	3	
Inspection	Inspection:Required or not	71	100%	1	
Install Date	Installation Date	22	31%	2	This variable is redundant. Installation date is tracked in the washer table.
Payee	Payee name on Check	71	100%	3	For ES Internal Use
ES Received	Date ES received application from	70	99%	3	For ES Internal Use

Washer Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
	partner				
Ownership	Business leases or purchases washer	29	41%	3	For ES Internal Use
Marketing	How learned about lightwash	26	37%	3	For ES Internal Use
Vendor	Vendor name	29	41%	3	For ES Internal Use
Reserved Amount	Funds reserved for customer	71	100%	3	For ES Internal Use
Reservation Date	When funds reserved	6	8%	3	For ES Internal Use
Status Date	Last time the status was changed	35	49%	3	For ES Internal Use
# of Commercial Washers	Number of washers at the site	33	46%	2	
Model	Model No. for installed washer	71	100%	1	
Quantity	Quantity of washers installed	71	100%	1	
Install Date in Washer Table	Installation Date	71	100%	1	

Lighting Component Results

For the lighting portion of the data assessment, Equipoise reviewed the database tables named "BBP_Prj_Inf_Header", BBP_Cust_Inf" and "BBP_Prj_Fixt_Details". The results of this assessment are presented in below in Exhibit 5. This table showed a high level of cell population with a few comments provided for specific variables.

Exhibit 4
Results for 3rd Quarter Verification

Population (Records)	Sample Size (Records)	Percent of Records Verified	Projects in Sample	Projects in Population
42	29	100%	42	29

Verification of hard copy data was performed on 10/16/03. This verification of hard copy indicated no problems.
The issue of independently calculating energy savings attributable to lighting project installation was assessed during the previous verification period. As ES provides the CPUC with lighting information on the kWh and kW reductions and not simply the number of projects, it appears that Equipoise should independently calculate these values. In the 2nd quarter of 2003, it was recommended that this table be requested in the next quarter's verification and that lighting kWh and kW be calculated by Equipoise with this data. ES provided this data as requested. However, since the desire is to perform a quick turn around with the verification of records, the analysis on the provided data did not occur.

As stated previously, this memo provides a paper verification of the program installations to date only. Equipoise will go into the field during the first quarter of 2004 to visually verify the existence of the installed lights. A final realization rate on the number of fixtures in the population will be developed and be incorporated in the final evaluation report.

Exhibit 5– Lighting Variables and Comments

Lighting Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
BBP_Cust_Inf_Q3					
CustomerId	Customer ID	29	100%	1	
Company	Company Name	29	100%	1	
ContactName	Contact Name	29	100%	1	
PhoneNumber	Contact Phone Number	28	97%	1	
Store Phone	Company Phone Number	4	14%	2	
Cell Phone	Contact Cell Phone Number	2	7%	2	
Fax	Contact Fax Number	6	21%	2	
MultiFamilyProperty	Y/N on multi family	29	100%	1	
Under100kW	Y/N on demand size of 100 kW	29	100%	1	
Under10people	Y/N on number of employees	29	100%	1	
TenantOccupied	Y/N on tenant occupied	29	100%	1	
LangPreference	Y/N on english as second language	29	100%	1	
BusSqrFootage	Square Footage of business	29	100%	2	
MAddress	Mailing Address	26	90%	2	
MAddress2	Mailing Address 2	1	3%	2	

Lighting Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
MCity	Mailing City	26	90%	2	
MZip	Mailing Zip	26	90%	2	
SameAs	Y/N on Installation Address same as Mailing	24	83%	2	
IAddress	Installation Mailing Address	29	100%	1	
IAddress2	Installation Mailing Address 2	0	0%	2	
ICity	Installation City	29	100%	1	
IZip	Installation Zip	27	93%	1	Needs 2 zip codes
TaxId	Participant Tax ID	0	0%	2	
MarketSector	Market Sector	29	100%	1	
WUtility	Water Utility Name	29	100%	1	
WAccount	Water Utility Account	0	0%	3	Not a relevant field
WRate	Water Utility Rate	0	0%	3	Not a relevant field
GUtility	Gas Utility Name	0	0%	3	Not a relevant field
GAccount	Gas Utility Account	0	0%	3	Not a relevant field
GRate	Gas Utility Rate	0	0%	3	Not a relevant field
EUtility	Electric Utility Name	29	100%	1	
EAccount	Electric Utility Account	28	97%	1	Needs 1 account value, plus one record with account in rate variable

Lighting Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
					and vice versa
ERate	Electric Utility Rate	28	97%	2	
WasherParticipant	Y/N on washer participation	0	0%	2	
LightingParticipant	Y/N on lighting participation	0	0%	3	Not a relevant field
Cross Street	Cross streets of installation	4	14%	3	For ES use
Scheduling Comment	Comments for scheduling	1	3%	3	For ES use
Appointment Date	Date of appointment	2	7%	3	For ES use
Appointment time	Time of appointment	1	3%	3	For ES use
BBP_Prj_Inf_Header_Q3					
CustomerId	Customer ID	29	100%	1	
ProjectNumber	Project Number	29	100%	1	
VendorName	Name of Installation Vendor	29	100%	2	
GroupNumber	Group Number	29	100%	2	
ParticipantStatus	Paid or not	29	100%	1	
PreFieldInspectionDate	Pre Inspection Date	29	100%	3	
PreFieldInspector	Pre Inspection Person	29	100%	3	
PostFieldInspectionDate	Post Inspection Date	29	100%	3	
PostFieldInspector	Post Inspection Person	29	100%	3	

Lighting Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
Access Agreemenet Received	Date Access Agreement Received	29	100%	1	
Appointment Date	Date of appointment	1	3%	3	
Scheduled For	Person doing appointment	29	100%	3	
Appointment Time	Time of appointment	2	7%	3	
PostFieldInspectionStatus2	Status of Post Inspection	29	100%	3	
CouponNumber	Coupon Number	29	100%	3	
TotalIncentiveAmt	Total Incentive Amount	29	100%	1	
CustomerCostShare	Amount Customer Pays	29	100%	2	
IOUIncentiveAmt	PGC Incentive Amount	29	100%	1	
WaterIncentiveAmt	Incentive Amount from Water Utility	29	100%	3	
IOUCheckNumber	PGC Incentive Check Number	29	100%	1	
WaterCheckNumber	Incentive Check Number from Water Utility	29	100%	3	
IncentiveCheckDate	Incentive Check Date (First Check)	29	100%	1	
IncentiveCheckDate2	Incentive Check Date (Second Check)	0	0%	3	
ReceivedDate	Date of first contact with customer	29	100%	3	
BBP_Prj_Fixt_Details_Q3					
WorkOrderNumber	Work Order Number	242	100%	1	

Lighting Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
ProjectNumber	Project Number	242	100%	1	
CustomerId	Customer ID	242	100%	1	
ExistingMeasureCodenDesc	Lighting Code of Existing Fixture	242	100%	1	
ExistingMeasureQty	Existing Lamp Counts	242	100%	1	
ExistingMeasureComts	Existing Fixture Comments	128	53%	3	
RecomdMeasureCodenDesc	Lighting Code of Recommended Fixture	242	100%	1	
RecomdMeasureQty	Recommended Lamp Counts	242	100%	1	
RecomdMeasureComts	Recommended Fixture Comments	239	99%	3	
PreTotalPowerSavings	Estimated kW impact pre installation	242	100%	2	All zeros
PostTotalNoOfMeasures	Post lamps installed	242	100%	2	All zeros
PostTotalNoOfSavings	Estimated kW impact post installation	242	100%	2	All zeros
PreTotalCostPerkW	Estimated cost/kW pre installation	242	100%	3	All zeros
PostTotalCostPerkW	Estimated cost/kW post installation	242	100%	3	All zeros
ExistLightOperationHrs	Existing Lighting Hours of Operation	239	99%	2	Not used
ExistLightFixtureWatts	Existing Lighting Connected Load (watts)	242	100%	2	Not used
RecomdLightFixtWatts	Recommended Lighting Connected Load (watts)	242	100%	2	Not used
RecomdLightOperationHrs	Recommend Lighting Hours of Operation	241	100%	2	Not used
ExistLightLocation	Existing Light Location (at site)	0	0%	2	

Lighting Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
AvgElectricRate	Average Electric Rate ($)	242	100%	3	
RecomdLightLocation	Recommended Lighting Location (at site)	242	100%	1	
Ext_Remd_Link_No	Link to another table	242	100%	1	
BF_Selection	Link to another table	242	100%	1	

January 20, 2004

MEMO

To: Ted Pope & Bruce Chamberlain, Energy Solutions

From: Mary Sutter, Equipoise Consulting Inc.

Re: 4th Quarter 2003 Verification

This memorandum summarizes Equipoise Consulting's (Equipoise) review of specific tables requested from the LightWash Energy Solutions (ES) database. This data assessment is intended to serve two functions. First, it forms a validation of ES's progress toward attaining its program goals. Second, it allows Equipoise to review the data to assure itself that the data needed for the eventual project evaluation is being collected and entered into the program database. The latter assessment also allows Equipoise to identify, for ES's benefit, areas of the database that may require attention.

Summary of Verification

Component	Unit	Original Units	Percent Verified	Verified Units
Washers	Washes Installed	1,826	100%	1,826
Lighting	Records in database	35	100%	35

This document covers the two components of the LightWash program. Each component used a sample of the population for verification purposes. The calculation of the sample size is presented first, followed by the method used in the verification, and then the results of the washer component and the lighting component verification.

Sample Size Determination

Equipoise pulled a sample of records for verification purposes. The sample was pulled using the following assumptions:

- Results of verification would be accurate at the 95th percentile,
- Expected percent of valid occurrences in the population set to 90% (conservative value), and
- Finite population correction factor is used.

The following algorithms were used to calculate the sample:

$$nsample = \frac{t^2 * p * (1 - p)}{d^2} \quad (1)$$

$$nfinite = \frac{nsample}{\left(1 + \frac{nsample}{N}\right)} \quad (2)$$

where:

t	=	1.645 (95% confidence level for a one-tailed t-test with infinite degrees of freedom)
p	=	expected percent of valid occurrences in the population (0.9)
d	=	desired level of accuracy (0.05)
N	=	population size
Nsample	=	required sample size without the finite population correction
nfinite	=	required sample with finite population correction

Verification Method

All records in project-specific (for washers) or customer-project-specific (for lighting) tables were provided a random value. The records in these main tables that fell into the sample frame as determined by the finite population correction value were verified. For tables linked to the main table, only those projects or customer-projects that were linked to records selected in the main table sample were verified.

For the sampled records, Equipoise assessed the total number of cells within each table that contained data, provided a subjective indicator of the importance of the data for both program and evaluation purposes, and subjective comments on the data populating the cells for each variable. An importance level of one (1) indicates that we feel that correct population of these cells is key to either evaluating the project or to documenting the program impacts. An importance level of two (2) indicates that these cells could be key to evaluating or documenting the program, but that it is impossible to tell based on the population of the database whether the cells in the database should be populated. An importance level of three (3) is a variable that we consider to be irrelevant for evaluating the program or documenting the program impacts.

Once the electronic verification of the data was completed, ten projects or customer-project records from the sampled group were randomly selected for visual verification of hardcopy data. The hardcopy data that was visually verified was the copy of the application with the customer signature and a copy of the check cut to the participant. In the case of washers paid by the Santa Clara Water District, the copy of the check cut will not be available to ES until the end of the year. Equipoise will need to go back and visually verify those checks at that time.

Washer Component Results

For the washer portion of the data assessment, Equipoise reviewed the database tables named "1PROJECT" and "1WASHER". ES supplied records for projects from the 4th quarter of 2003. Exhibit 1 presents a summary of the 4th quarter verification results for washers.

Exhibit 1
Results for 4th Quarter Verification

Population (Records)	Sample Size (Records)	Washers in Sample	Percent of Records Verified	Washers Verified in Population
253	70	278	100%	1,826

Verification of hard copy data was performed on 01/16/04. This verification of hard copy indicated no problems.

Exhibit 2 illustrates that the database showed high levels of cell population. Variables that are of importance = 1 and that have missing data have been commented on.

This memo provides a paper verification of the program installations to date only. It is currently planned that Equipoise will go into the field during the first quarter of 2004 to visually verify the existence of a sample of the installed washers. A final realization rate on the number of washers in the population will be developed and reported in the final evaluation report.

Exhibit 2 – Washer Variables and Comments

Washer Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
Project Number	Project Identification Number	70	100%	1	
B Name	Business Name	66	94%	1	OK, not all customers have a business name
C Name	Customer Name	70	100%	1	
Phone	Customer Phone Number	70	100%	1	
Phone Ext	Customer Extention	2	3%	3	
Fax	Customer Fax Number	48	69%	3	
M Address	Mailing Address	41	59%	3	
M Address2	Mailing Address Aux Field	0	0%	3	
M City	Mailing Address City	41	59%	3	
M State	Mailing Address State	70	100%	3	
M Zip	Mailing Address Zip	41	59%	3	
Same As	Install address same as Mail adress	70	100%	3	
I Address	Installation Address	70	100%	1	
I Address2	Installation Address Aux Field	0	0%	3	
I City	Installation City	70	100%	1	

Washer Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
Install Zip	Installation Zip Code	70	100%	1	
Tax ID	Participant Tax ID	35	50%	3	
Market Sector	Market Sector	70	100%	1	
W Utility	Water Utility	70	100%	1	
W Account	Water Utility Account No.	70	100%	1	
W Rate	Water Utility Rate Code	0	0%	3	
G Utility	Gas Utility	70	100%	1	
G Account	Gas Utility Account No.	70	100%	1	
G Rate	Gas Utility Rate Code	0	0%	3	
E Utility	Electric Utility	70	100%	1	Note: while 100% filled in, not all have actual data as this is not provided at this time by water utility
E Account	Electric Utility Acct. No.	70	100%	1	Note: while 100% filled in, not all have actual data as this is not provided at this time by water utility
E Rate	Electric Utiliity Rate Code	0	0%	3	
Washer Part	Participant in Washer Prog?	70	100%	1	
Lighting Part	Participant in Lighting Prog?	70	100%	2	

Washer Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
Status	Status of Project	70	100%	1	
Total Incentive Amount	Total Incentive Amount	70	100%	2	Currently a redundant field
Energy Incentive Amount	Energy Incentive Amount	70	100%	1	
Water Incentive Amount	Water Incentive Amount	70	100%	1	
Energy Check Number	Energy Check Number	70	100%	1	
Water Check Number	Water Check Number	70	100%	2	Currently a redundant field since all paid with one check
Incentive Check Date	Incentive Check Date	70	100%	1	
Incentive Check Date2	Incentive Check Date 2nd Check	0	0%	2	
Incentive	Incentive Amount	70	100%	1	
Incentive2	2nd Incentive Amount	70	100%	2	
Received Date	Date partner received application	31	44%	2	
Customer Phone2	Alternate Customer Phn No.	19	27%	3	
Phone2 Ext	Alternate Customer Extention	0	0%	3	
email address	Customer Email Address	10	14%	3	
DMC #	DMC Internal Tracking Number	29	41%	3	
Inspection	Inspection:Required or not	70	100%	1	

Washer Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
Install Date	Installation Date	0	0%	2	This variable is redundant. Installation date is tracked in the washer table.
Payee	Payee name on Check	70	100%	3	For ES Internal Use
ES Received	Date ES received application from partner	70	100%	3	For ES Internal Use
Ownership	Business leases or purchases washer	40	57%	3	For ES Internal Use
Marketing	How learned about lightwash	37	53%	3	For ES Internal Use
Vendor	Vendor name	41	59%	3	For ES Internal Use
Reserved Amount	Funds reserved for customer	70	100%	3	For ES Internal Use
Reservation Date	When funds reserved	6	9%	3	For ES Internal Use
Status Date	Last time the status was changed	41	59%	3	For ES Internal Use
# of Commercial Washers	Number of washers at the site	66	94%	2	
Model	Model No. for installed washer	70	100%	1	
Quantity	Quantity of washers installed	70	100%	1	
Install Date in Washer Table	Installation Date	70	100%	1	

Lighting Component Results

For the lighting portion of the data assessment, Equipoise reviewed the database tables named "BBP_Prj_Inf_Header", BBP_Cust_Inf" and "BBP_Prj_Fixt_Details". The overall results of the lighting element assessment are summarized in Exhibit 3.

Exhibit 3
Results for 4th Quarter Verification

Population (Records)	Sample Size (Records)	Projects in Sample	Percent of Records Verified	Projects Verified in Population
35	26	26	100%	35

The detailed results of this assessment are presented in below in Exhibit 4. This table showed a high level of cell population with a few comments provided for specific variables.

Verification of hard copy data was performed on 01/16/04. This verification of hard copy indicated no problems.
The issue of independently calculating energy savings attributable to lighting project installation was assessed during the 2nd quarter of 2003. As ES provides the CPUC with lighting information on the kWh and kW reductions and not simply the number of projects, it appears that Equipoise should independently calculate these values. In the 2nd quarter of 2003, it was recommended by Equipoise that lighting kWh and kW be calculated by Equipoise. However, further thought on this did not indicate a need for the analysis to occur during the quarterly verification as it would happen prior to the report. Therefore, this analysis did not occur.

As stated previously, this memo provides a paper verification of the program installations to date only. Equipoise will go into the field during the first quarter of 2004 to visually verify the existence of a sample of the installed lights. A final realization rate on the number of fixtures in the population will be developed and be incorporated in the final evaluation report.

Exhibit 4 – Lighting Variables and Comments

Lighting Variables and Comments					
Variables	**Assumed Meaning**	**N. Points Filled**	**Percent Filled**	**Importance**	**Comment**
BBP_Cust_Inf_Q4					
CustomerId	Customer ID	26	100%	1	
Company	Company Name	26	100%	1	
ContactName	Contact Name	26	100%	1	
PhoneNumber	Contact Phone Number	26	100%	1	
Store Phone	Company Phone Number	1	4%	2	
Cell Phone	Contact Cell Phone Number	0	0%	2	
Fax	Contact Fax Number	1	4%	2	
MultiFamilyProperty	Y/N on multi family	26	100%	1	
Under100kW	Y/N on demand size of 100 kW	26	100%	1	
Under10people	Y/N on number of employees	26	100%	1	
TenantOccupied	Y/N on tenant occupied	26	100%	1	
LangPreference	Y/N on english as second language	26	100%	1	
BusSqrFootage	Square Footage of business	26	100%	2	

Lighting Variables and Comments					
MAddress	Mailing Address	22	85%	2	
MAddress2	Mailing Address 2	0	0%	2	
MCity	Mailing City	22	85%	2	
MZip	Mailing Zip	21	81%	2	
SameAs	Y/N on Installation Address same as Mailing	15	58%	2	
IAddress	Installation Mailing Address	26	100%	1	
IAddress2	Installation Mailing Address 2	0	0%	2	
ICity	Installation City	26	100%	1	
IZip	Installation Zip	22	85%	1	Needs 4 zip codes
TaxId	Participant Tax ID	0	0%	2	
MarketSector	Market Sector	26	100%	1	
WUtility	Water Utility Name	26	100%	1	
WAccount	Water Utility Account	0	0%	3	Not a relevant field
WRate	Water Utility Rate	0	0%	3	Not a relevant field
GUtility	Gas Utility Name	0	0%	3	Not a relevant field
GAccount	Gas Utility Account	0	0%	3	Not a relevant

Lighting Variables and Comments					
					field
GRate	Gas Utility Rate	0	0%	3	Not a relevant field
EUtility	Electric Utility Name	26	100%	1	
EAccount	Electric Utility Account	26	100%	1	
ERate	Electric Utility Rate	23	88%	2	
WasherParticipant	Y/N on washer participation	0	0%	2	
LightingParticipant	Y/N on lighting participation	0	0%	3	Not a relevant field
Cross Street	Cross streets of installation	2	8%	3	For ES use
Scheduling Comment	Comments for scheduling	1	4%	3	For ES use
Appointment Date	Date of appointment	0	0%	3	For ES use
Appointment time	Time of appointment	0	0%	3	For ES use
BBP_Prj_Inf_Header_Q4					
CustomerId	Customer ID	26	100%	1	
ProjectNumber	Project Number	26	100%	1	
VendorName	Name of Installation Vendor	26	100%	2	
GroupNumber	Group Number	26	100%	2	
ParticipantStatus	Paid or not	26	100%	1	
PreFieldInspectionDate	Pre Inspection Date	26	100%	3	

Lighting Variables and Comments					
PreFieldInspector	Pre Inspection Person	26	100%	3	
PostFieldInspectionDate	Post Inspection Date	26	100%	3	
PostFieldInspector	Post Inspection Person	26	100%	3	
Access Agreemenet Received	Date Access Agreement Received	26	100%	1	
Appointment Date	Date of appointment	0	0%	3	
Scheduled For	Person doing appointment	26	100%	3	
Appointment Time	Time of appointment	0	0%	3	
PostFieldInspectionStatus2	Status of Post Inspection	26	100%	3	
CouponNumber	Coupon Number	26	100%	3	All zeros
TotalIncentiveAmt	Total Incentive Amount	26	100%	1	
CustomerCostShare	Amount Customer Pays	26	100%	2	
IOUIncentiveAmt	PGC Incentive Amount	26	100%	1	
WaterIncentiveAmt	Incentive Amount from Water Utility	26	100%	3	All zeros
IOUCheckNumber	PGC Incentive Check Number	26	100%	1	
WaterCheckNumber	Incentive Check Number from Water Utility	26	100%	3	All zeros
IncentiveCheckDate	Incentive Check Date (First Check)	26	100%	1	
IncentiveCheckDate2	Incentive Check Date (Second Check)	0	0%	3	

Lighting Variables and Comments					
ReceivedDate	Date of first contact with customer	26	100%	3	
BBP_Prj_Fixt_Details_Q4					
WorkOrderNumber	Work Order Number	177	100%	1	
ProjectNumber	Project Number	177	100%	1	
CustomerId	Customer ID	177	100%	1	
ExistingMeasureCodenDesc	Lighting Code of Existing Fixture	176	99%	1	OK - labeled as "setup"
ExistingMeasureQty	Existing Lamp Counts	177	100%	1	
ExistingMeasureComts	Existing Fixture Comments	92	52%	3	
RecomdMeasureCodenDesc	Lighting Code of Recommended Fixture	177	100%	1	
RecomdMeasureQty	Recommended Lamp Counts	177	100%	1	
RecomdMeasureComts	Recommended Fixture Comments	175	99%	3	
PreTotalPowerSavings	Estimated kW impact pre installation	177	100%	2	All zeros
PostTotalNoOfMeasures	Post lamps installed	177	100%	2	All zeros
PostTotalNoOfSavings	Estimated kW impact post installation	177	100%	2	All zeros
PreTotalCostPerkW	Estimated cost/kW pre installation	177	100%	3	All zeros
PostTotalCostPerkW	Estimated cost/kW post installation	177	100%	3	All zeros
ExistLightOperationHrs	Existing Lighting Hours of Operation	174	98%	2	Not used
ExistLightFixtureWatts	Existing Lighting Connected Load	177	100%	2	Not used

Lighting Variables and Comments					
	(watts)				
RecomdLightFixtWatts	Recommended Lighting Connected Load (watts)	177	100%	2	Not used
RecomdLightOperationHrs	Recommend Lighting Hours of Operation	174	98%	2	Not used
ExistLightLocation	Existing Light Location (at site)	0	0%	2	
AvgElectricRate	Average Electric Rate ($)	177	100%	3	
RecomdLightLocation	Recommended Lighting Location (at site)	177	100%	1	
Ext_Remd_Link_No	Link to another table	177	100%	1	
BF_Selection	Link to another table	177	100%	1	

D. FINAL DATA COLLECTION INSTRUMENTS

LightWash Program Evaluation
Data Collection Instrument

Site Name: _____

Site Address: _____

Site City: _____

Audit Date: _____

❑ Lighting Site

❑ Washer Site

❑ Lighting & Washer Site

Power Service Utility

❑ PG&E ❑ SDG&E ❑ SoCalGas

Type of Site

❑ Multi-Family ❑ Laundromat ❑ Other _____

Lighting Sites

Type of Fixture	N Expected	N Found	Comments

Washer Sites

Type of Washer	N Expected	N Found	Comments

LightWash Market Actor Data Collection Instrument

Lighting Component

Hello, my name is _____. I am calling about the LightWash program. Do you recall getting the lights in your business replaced through LightWash?

Yes..... 1 (GO TO SCREENER 2)
No.....2
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

Is there someone who might know about the lighting retrofit?

Yes..... 1 (GO TO SCREENER 1)
No..... 2 (Thank and terminate)
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

SCREENER 1: If yes, ask to speak to that person, but the person is not there, get their name and phone number: _____ and T&T.

SCREENER 2: Your Company recently received incentives for your new lighting installations in your business. The State of California requires that we evaluate the program that provided those incentives. Do you have about 10 or 15 minutes to help us assess the effectiveness of this program?

Yes..... 1 (GO TO BEGINNING)
No.....2
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

Can we schedule a time to call you back? [OBTAIN NEW TIME _____OR T&T]

BEGINNING: Our first set of questions asks a little about the energy efficient lighting installation and use.

1. Our records indicate that the rebated energy efficient lighting was installed in a [INSERT TYPE OF SITE FROM DATABASE ENTRY]. Is this correct?

   Yes.....1 (GO TO Q 3)

No.....2
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

2. How would you characterize the site where the energy efficient lighting was installed? Would you say it is... [READ LIST]

Laundromat 1
Retail.....2
Restaurant.....3
Office 4
School.....5
Warehouse 6
Something else (Specify_____) 77
Don't Know (DON'T READ) ..... -99 [THANK and TERMINATE]
Refused (DON'T READ) ..... -88 [THANK and TERMINATE]

3. Are you the person who sees or pays the electric utility bills for this facility?

Yes.....1
No..... 2 [GO TO Q5]
Don't Know (DON'T READ) .....-99 [GO TO Q5]
Refused (DON'T READ) .....-88 [GO TO Q5]

4. I have a few questions about the electric bill.

a. Do you look at your electric bill closely enough to identify changes in the monthly cost?

Yes.....1
No..... 2 [GO TO Q 5]
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

b. After the energy efficient lighting was installed, did you notice a reduction in your electric bill?

Yes.....1
No..... 2 [GO TO Q 5]
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

c. Would you consider the reduction you saw in your electric bill large, medium or small?

Large.....1

Medium 2
Small 3
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

5. Now I'd like to ask about the rebates. How did you hear about the rebate for the energy efficient lighting? [DO NOT READ RESPONSES, ALLOW MULTIPLE ANSWERS]

Presentation / brochure at a trade show or local association meeting 1
The local water utility.....2
Advertisement or article in a trade journal or newsletter 3
Recruited by a person coming into my business 4
From a postcard or letter mailed to me 5
From the property manager 6
From a colleague or adjacent business 7
Other (Specify_____) 77
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

6. Prior to hearing about the program, had you looked into the possibility of installing energy efficient lighting?

Yes.....1
No.....2 [GO TO Q8]
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

7. Why had you not installed energy efficient lighting prior to your interaction with the program? (DON'T READ)

The installation cost was too high 1
The lighting type was relatively new.....2
I was too busy to figure it out.....3
I wasn't sure the payback was there 4
Other (Specify_____) 77
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

8. What is the primary element of the program that caused you to install energy efficient lighting now?

The rebate 1

Project Management ……......2
Installer Oversight… 3
Program offered turnkey installation 4
Program convinced me about payback 5
Program appealed to environmental desires 6
I didn't have to pay much.....7
Other (Specify_____).....77
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

9. Do you own or lease other facilities similar to the one where the energy efficient lighting was installed?

Yes.....1
No..... 2 [GO TO EE DEFINITION]
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-888

10. Is energy efficient lighting currently installed in any of those facilities?

Yes.....1
No ..... 2 [GO TO EE DEFINITION]
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

11. Were rebates received for some or all these lighting retrofits under the LightWash program?

Yes..... 1 [GO TO EE DEFINITION]
No.....2
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

IF LAUNDROMAT == 0;

12. Why not? [Note to interviewer: If the location was not a Laundromat, and it entered the program because it was adjacent to a Laundromat, then it's other locations could not be covered under the LightWash program.]

They were installed before the rebates were available 1
They were installed before I heard about the rebates 2
I did not want to bother with the rebates for these lights.....3

The locations were not covered by the LightWash program 4
Didn't know other laudromat locations could also be covered by LightWash 5
Other (Specify) 77
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

EE DEFINITION: To allow you to answer the next few questions, we first need to define what we mean by the term "energy efficiency". Energy efficiency refers to any change made in equipment or practices that accomplishes the same task while consuming less energy.

13. Did your participation in the LightWash program change your attitudes about energy efficiency in general?

Yes.....1 [GO TO Q 15]
No.....2
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

14. Would you say you are very positive, somewhat positive, not very positive or not at all positive about energy efficiency in general?

Very positive.....1 [GO TO Q 17]
Somewhat positive .....2 [GO TO Q 17]
Not very positive.....3 [GO TO Q 17]
Not at all positive .....4 [GO TO Q 17]
Don't Know (DON'T READ) .....-99 [GO TO Q 17]
Refused (DON'T READ) .....-88 [GO TO Q 17]

15. Prior to participating in the program, would you say you were very positive, somewhat positive, not very positive or not at all positive about energy efficiency in general?

Very positive.....1
Somewhat positive 2
Not very positive.....3
Not at all positive 4
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

16. Now, AFTER participating in the program, would you say you were very positive, somewhat positive, not very positive or not at all positive about energy efficiency in general?

Very positive.....1

Somewhat positive 2
Not very positive.....3
Not at all positive 4
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

17. Many things can change your possible actions in the future. I am going to read a set of statements for which I would like you to state, based on your perspective today, whether you definitely would, probably would, probably would not, or definitely would not take the action. Based on your experience to date with the energy efficient lights, would you say you would .[READ QUESTION]

Question	Definitely Would (1)	Probably Would (2)	Probably Would Not (3)	Definitely Would Not (4)	NA (5)	Don't Know (-99)	Refused (-88)
A. Purchase high energy efficient lights when needed if the current level of rebates were available							
B. Purchase high energy efficient lights when needed if HALF OF the current level of rebates were available							
C. Purchase energy efficient lights when needed even if there were no rebates available							

IF A OR B = 3 OR 4, CONTINUE, ELSE GO TO Q 19

18. Why do you think you probably would not purchase energy efficient lights in the future? (DO NOT READ)

The lights are failing more frequently than regular lights.....1
The replacement lamps are more expensive than regular lamps 2
The savings are not as large as what I expected.....3
I don't like the quality of the light they provide.....4
Other (Specify_____).....77
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

IF FACILITY TYPE=COIN OPERATED LAUNDROMAT, CONTINUE, ELSE T&T.
IF WASHER INSTALLATION = [NO] CONTINUE, ELSE GO TO Q 20

19. Your facility was also eligible for rebates from LightWash or your water utility to replace your current clothes washers with high efficiency clothes washers. Had you heard of this possibility?

Yes.....1
No.....2 [T&T]
Don't Know (DON'T READ) .....-99 [T&T]
Refused (DON'T READ) .....-88 [T&T]

20. Was your decision to install energy efficient lighting in any way influenced by the high efficiency washer component of the program?

Yes.....1
No.....2 [T&T]
Don't Know (DON'T READ) .....-99 [T&T]
Refused (DON'T READ) .....-88 [T&T]

21. How did it influence you?

The possible washer retrofit made me aware of the lighting program 1
Washer savings made me made me inquire about other options 2
Other (Specify) 77
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

Thank you very much for your time.

LightWash Market Actor Data Collection Instrument

Washer Component

Hello, my name is _____. Your company recently received incentives for your new clothes washers. The State of California requires that we evaluate the program that provided those incentives. Do you have about 10-15 minutes to help us assess the effectiveness of this program?

SCREENER FOR CORRECT PERSON:
Are you the person who is responsible for the clothes washers at your site or works with a route operator?

Yes..... 1 (GO TO BEGINNING]
No.....2
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

Can you direct me to the most appropriate person? [OBTAIN NEW NAME OR T&T]

BEGINNING: The incentive you received for installing the water and energy efficient clothes washers, which I will simply call high efficiency clothes washers from now on, may have been from either your local water utility, a program called LightWash, or both. We are calling to evaluate the LightWash program only, but who you got your rebate from does not matter for this survey. Our first set of questions asks a little about where the washers were installed and who is responsible for them.

1. Our records indicate that the rebated high efficiency clothes washers were installed in a [INSERT TYPE OF SITE FROM DATABASE ENTRY]. Is this correct?

   Yes.....1 (GO TO Q3)
   No.....2
   Don't Know (DON'T READ) .....-99
   Refused (DON'T READ) .....-88

2. How would you characterize the site where the high efficiency clothes washers were installed, then? Would you say it is... [READ LIST]

   multi-family dwelling (an apartment, a condo or townhouse complex).....1
   laundromat (a coin operated Laundromat).....2
   institutional (university, a hospital, prison, etc.).....3
   A Business other than a Laundromat……...……4
   something else (Specify_____).....77
   Don't Know (DON'T READ) ..... -99 [THANK and TERMINATE]
   Refused (DON'T READ) ..... -88 [THANK and TERMINATE]

3. Who purchased/owns the rebated high efficiency clothes washers for your facility? Was it.... [READ LIST]

   A route operator.....1

The building owner..... 2 [GO TO Q7]
The homeowners association..... 3 [GO TO Q7]
The property management company ..... 4 [GO TO Q7]
Other (Specify_____) ..... 77 [GO TO Q7]
Don't Know (DON'T READ) .....-99 [GO TO Q7]
Refused (DON'T READ) .....-88 [GO TO Q7]

4. What is the name of your route operator?

Collieers Service Co……..1
All Laundry Leasing & Sales…….2
CoinMach……...3
Consolidated Smart Systems L.A……..4
F&B Coin Laundry Route…….5
Foster's CoinWasher Service Inc……..6
Macke Laundry Service……7
Washtek Inc……..8
Web Service Company…….9
Other (Record Name)……..77
Refused……88
Don't Know…….99

5. The contract you have with your route operator generally defines the compensation they receive from you. Did the route operator request changes in the contract terms because of the purchase of the high efficiency clothes washers (IF PROMTED READ: relative to what would have been the terms if installing standard top loaders)?

Yes.....1
No..... 2 [GO TO Q7]
Don't Know (DON'T READ) .....-99 [GO TO Q7]
Refused (DON'T READ) .....-88 [GO TO Q7]

6. Was the contract changed between the route operator and yourself as a result the purchase of the high efficiency clothes washers?

Yes.....1

No.....2

Don't Know (DON'T READ) .....-99

Refused (DON'T READ) .....-88

7. For the laundry facility we are discussing, can you tell me the average number of times the typical machine is used each day? (This is also called the turns or wash cycles per machine per day)

_____

Don't Know (DON'T READ) .....-99 [GO TO Q3]

Refused (DON'T READ) .....-88 [GO TO Q3]

8. How did you estimate that number? Was it .....[READ LIST] [RANDOM]

Based on the coin box revenues.....1

A guess based on your knowledge of the machines 2

Based on data from your route operator 3

Other (Specify _____) 77

Don't Know (DON'T READ) .....-99

Refused (DON'T READ) .....-88

9. The utility bills that we are most interested in are the water, electric and natural gas bills. Are you the person who sees or pays the utility bills for this facility?

Yes.....1

No.....2 [GO TO Q5]

Don't Know (DON'T READ) .....-99 [GO TO Q5]

Refused (DON'T READ) .....-88 [GO TO Q5]

10. I have a set of three questions about each bill. (RANDOMIZE UTILITY IN NEXT THREE QUESTIONS FOR WATER, ELECTRICITY, AND NATURAL GAS. CYCLE THROUGH A-C UNTIL ALL THREE UTILITIES HAVE BEEN ASKED]

This section was asked in three (3) groups:

WATER = Q10WA, Q10WB Q10WC

ELECTRICITY = Q10EA, Q10EB, Q10EC

NATURAL GAS = Q10GA, Q10GB, Q10QC

a. Do you look at your [UTILITY] bill closely enough to identify changes in the monthly cost?

Yes.....1

No.....2 [GO TO NEXT UTILITY]

Don't Know (DON'T READ) .....-99

Refused (DON'T READ) ..... -88

b. After the high efficiency clothes washers were installed, did you notice a reduction in your [UTILITY] bill?

Yes..... 1

No..... 2 [GO TO NEXT UTILITY]

Don't Know (DON'T READ) ..... -99

Refused (DON'T READ) ..... -88

c. Would you consider the reduction you saw in your [UTILITY] bill to be large, medium or small?

Large 1

Medium 2

Small 3

Don't Know (DON'T READ) ..... -99

Refused (DON'T READ) ..... -88

Now I'd like to ask about the rebates.

11. How did you hear about the rebate for the high efficiency clothes washers? [DO NOT READ RESPONSES, ALLOW MULTIPLE ANSWERS]

Presentation / brochure at a trade show or local association meeting 1

The local water utility..... 2

Advertisement in a trade journal or newsletter 3

Article in trade journal or newsletter..... 4

From a postcard or letter mailed to me 5

From my route operator 6

From the property manager 7

From a colleague..... 8

Other (Specify_____) 77

Don't Know (DON'T READ) ..... -99

Refused (DON'T READ) ..... -88

12. Many of the advertisements used by the program indicated possible percentages of reductions you might see in water, electricity, or natural gas use. Or they may have shown possible dollar reductions from the high efficiency clothes washer. Do you remember seeing this type of information? [DO NOT READ, BUT IF ASKED YOU CAN STATE THAT THE ADVERTISEMENTS OFTEN INDICATED 30%-50% LESS WATER USE AND 50% LESS ENERGY USE]

    Yes.....1
    No.....2 [GO TO Q15]
    Don't Know (DON'T READ) .....-99
    Refused (DON'T READ) .....-88 [GO TO Q15]

13. Did you think the possible savings were very believable, somewhat believable, not very believable, or not at all believable?

    Very Believable.....1
    Somewhat Believable 2
    Not Very Believable.....3
    Not at all Believable 4
    Don't Know (DON'T READ) .....-99
    Refused (DON'T READ) .....-88

14. Of the water and energy savings indicated in many of the advertisements, which one was more important for you?

    Water Savings.....1
    Energy Savings.....2
    Both were of equal importance 3
    Don't Know (DON'T READ) .....-99
    Refused (DON'T READ) .....-88

15. Have you ever heard of Energy Star labeled clothes washers?

    Yes.....1
    No.....2
    Don't Know (DON'T READ) .....-99
    Refused (DON'T READ) .....-88

16. Prior to seeing the program material on high efficiency clothes washers, how aware were you of their benefits? Would you say you were (READ LIST)

    Very Aware.....1
    Somewhat Aware 2

Not Very Aware.....3
Not at all Aware .....4 [GO TO Q8]
Don't Know (DON'T READ) .....-99 [GO TO Q8]
Refused (DON'T READ) .....-88 [GO TO Q8]

17. After reviewing the program material on the high efficiency clothes washers, how aware were you of benefits of high efficiency washers? Would you say you were (READ LIST)

Very Aware.....1
Somewhat Aware 2
Not Very Aware.....3
Not at all Aware .....4 [GO TO Q8]
Don't Know (DON'T READ) .....-99 [GO TO Q8]
Refused (DON'T READ) .....-88 [GO TO Q8]

18. Prior to hearing about the program, had you looked into the possibility of installing high efficiency clothes washers?

Yes.....1
No.....2 [GO TO Q8]
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

19. Why had you not installed high efficiency washing machines prior to your interaction with the program? (DON'T READ)

It was too costly.....1
The current machines were relatively new.....2
We don't buy our machines.....3
I wasn't sure it would be worth the extra money.....4
Other (Specify_____) 77
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

20. Do you own or manage other facilities with clothes washers?

Yes.....1
No.....2 [GO TO Q0]
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

21. Are high efficiency washing machines currently installed in any of those facilities?

Yes.....1
No.....2 [GO TO Q0]
Don't Know (DON'T READ).....-99
Refused (DON'T READ).....-88

22. Approximately how many high efficiency clothes washers are installed across all of the sites?

Number _____
Don't Know (DON'T READ).....-99
Refused (DON'T READ).....-88

23. Were rebates received for all these washers?

Yes.....1 [GO TO EE DEFINITION]
No.....2
Don't Know (DON'T READ).....-99
Refused (DON'T READ).....-88

24. Why not?

They were installed before the rebates were available.....1
They were installed before I heard about the rebates.....2
I did not want to bother with the rebates for these washers.....3
I received rebates for a percentage of the washers, but not all.....4
Installed outside of the eligible area.....5
Other (Specify).....77
Don't Know (DON'T READ).....-99
Refused (DON'T READ).....-88

IF Q24 == 4 (some percentage of washers received rebates)

Q24PC What percentage of your washers did you receive a rebate for?

Don't Know (DON'T READ).....-99
Refused (DON'T READ).....-88

EE DEFINITION: To allow you to answer the next few questions, we first need to define what we mean by the term "energy efficiency". Energy efficiency is any change made in equipment or practices to accomplish the same task while consuming less energy.

25. Did your participation in the LightWash program change your attitudes about energy efficiency in general?

Yes.....1 [GO TO Q 15]
No.....2
Don't Know (DON'T READ).....-99
Refused (DON'T READ).....-88

26. Would you say you are very positive, somewhat positive, not very positive or not at all positive about energy efficiency in general?

Very positive.....1 [GO TO Q 29]
Somewhat positive.....2 [GO TO Q 29]
Not very positive.....3 [GO TO Q 29]
Not at all positive.....4 [GO TO Q 29]
Don't Know (DON'T READ).....-99 [GO TO Q 29]
Refused (DON'T READ).....-88 [GO TO Q 29]

27. Prior to participating in the program, would you say you were very positive, somewhat positive, not very positive or not at all positive about energy efficiency in general?

Very positive.....1
Somewhat positive.....2
Not very positive.....3
Not at all positive.....4
Don't Know (DON'T READ).....-99
Refused (DON'T READ).....-88

28. Now, AFTER to participating in the program, would you say you were very positive, somewhat positive, not very positive or not at all positive about energy efficiency in general?

Very positive.....1
Somewhat positive.....2
Not very positive.....3
Not at all positive.....4
Don't Know (DON'T READ).....-99
Refused (DON'T READ).....-88

29. Many things can change your possible actions in the future. I am going to read a set of statements for which I would like you to state, given how things are today, whether you definitely would, probably would, probably would not, or definitely would not take the action. Based on your experience to date with the efficient washers, would you say you would ..[READ QUESTION]

Question	Definitely Would (1)	Probably Would (2)	Probably Would Not (3)	Definitely Would Not (4)	NA (5)	Don't Know (-99)	Refused (-88)
A. Install high efficiency clothes washers when needed if the current level of rebates were available [IF A=5, GO TO D]							
B. Install high efficiency clothes washers when needed if HALF OF the current level of rebates were available							
C. Install high efficiency clothes washers when needed even if there were not rebates available [SKIP D]							
D. Request your route operator to install high efficiency clothes washers when new washers are needed							

IF A OR B = 3 OR 4, CONTINUE, ELSE GO TO Q 31.

30. Why do you think you probably would not purchase high efficiency washing machines in the future? (DO NOT READ)

The machines require more maintenance than my regular machines 1
The maintenance is more expensive 2
The savings are not as large as what I expected.....3
The users don't like them.....4
There is too much soap being used and it creates problems 5
The machines are too expensive.....6
Other (Specify_____) 77
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

31. IF UTILITY FLAG=PG&E AND FACITILTY TYPE=COIN OPERATED LAUNDROMAT, CONTINUE, ELSE T&T or Q2 == LAUNDROMAT
Your site may have been eligible to replace your lighting fixtures with energy efficient fixtures in your laundromat. Had you heard of this possibility?

Yes.....1
No.....2 [T&T]
Don't Know (DON'T READ) .....-99 [T&T]
Refused (DON'T READ) .....-88 [T&T]

32. Was your decision to install energy efficient washers in any way influenced by the lighting component of the program?

Yes.....1
No.....2 [T&T]
Don't Know (DON'T READ) .....-99 [T&T]
Refused (DON'T READ) .....-88 [T&T]

33. How did it influence you?

The possible lighting retrofit made me aware of the washer program 1
Lighting savings made me made me enquire about other options 2
Other (Specify) 77
Don't Know (DON'T READ) .....-99
Refused (DON'T READ) .....-88

Thank you very much for your time.

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E. PARTICIPANT SURVEY RESPONSES

Lighting Participants

Frequencies

Notes		
Output Created		28-APR-2004 17:23:30
Comments		
Input	**Data**	Macintosh HD:Users:abjones:Documents:Vanward Consulting:Equipoise:LightWash Evaluation:Data Analysis:Working Data Files:Lighting data file v3.sav
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	72
Missing Value Handling	**Definition of Missing**	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data.
Syntax		FREQUENCIES VARIABLES=wash_ins laundrom q1 q2 q3 q4a q4b q4c q6 q8 q9 q10 q11 q13 q19 q20 bus_type /ORDER= ANALYSIS .
Resources	**Total Values Allowed**	149796
	Elapsed Time	0:00:00.00

Statistics

		<wash_ins> Washer program participant	<laundrom> Facility Type	<q1> Rebated energy efficient lighting was installed. Correct facility type?	<q2> How characterize the site where the lighting is installed?	<q3> Are you the person who sees/pays the electric utility bill for the facility?	<q4a> Do you look at your electric bill closely enough to identify changes?	<q4b> After the energy efficient lighting was installed, did you notice a reduction in your bill?	<q4c> Would you consider the reduction in your bill large, medium, or small?	<q6> Prior to the program, had you looked into installing energy efficient lighting?	<q8> What is the primary element of the program that caused you to install energy efficient lighting now?	<q9> Do you own or lease other facilities similar to the one where the energy efficient lighting is installed?	<q10> Is energy efficient lighting currently installed in any of those facilities?	<q11> Were rebates received for some or all of these lighting retrofits under the LightWash Program?	<q13> Did participating in the program change your attitudes about energy efficiency in general?	<q19> Your facility was also eligible for rebates to replace your current clothes washers with high efficiency clothes washers.	<q20> Was your decision to install EE lighting influenced by the washer component of the program?	<bus_type>
N	Valid	72	72	72	3	72	65	40	30	68	66	71	12	9	66	27	22	72
	Missing	0	0	0	69	0	7	32	42	4	6	1	60	63	6	45	50	0

<wash_ins> Washer program participant					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	70	97.2	97.2	97.2
	Yes	2	2.8	2.8	100.0
	Total	72	100.0	100.0	

<laundrom> Facility Type					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Laundromat	29	40.3	40.3	40.3
	Other	43	59.7	59.7	100.0
	Total	72	100.0	100.0	

<q1> Rebated energy efficient lighting was installed. Correct facility type?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	69	95.8	95.8	95.8
	No	3	4.2	4.2	100.0
	Total	72	100.0	100.0	

<q2> How characterize the site where the lighting is installed?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Retail	1	1.4	33.3	33.3
	Other	2	2.8	66.7	100.0
	Total	3	4.2	100.0	
Missing	System	69	95.8		
Total		72	100.0		

<q3> Are you the person who sees/pays the electric utility bill for the facility?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	66	91.7	91.7	91.7
	No	6	8.3	8.3	100.0
	Total	72	100.0	100.0	

<q4a> Do you look at your electric bill closely enough to identify changes?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	46	63.9	70.8	70.8
	No	19	26.4	29.2	100.0
	Total	65	90.3	100.0	
Missing	-99	6	8.3		
	Don't Know	1	1.4		
	Total	7	9.7		
Total		72	100.0		

<q4b> After the energy efficient lighting was installed, did you notice a reduction in your bill?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	30	41.7	75.0	75.0
	No	10	13.9	25.0	100.0
	Total	40	55.6	100.0	
Missing	-100	1	1.4		
	-99	25	34.7		
	Don't Know	6	8.3		
	Total	32	44.4		
Total		72	100.0		

<q4c> Would you consider the reduction in your bill large, medium, or small?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Large	5	6.9	16.7	16.7
	Medium	8	11.1	26.7	43.3
	Small	17	23.6	56.7	100.0
	Total	30	41.7	100.0	
Missing	-100	7	9.7		
	-99	16	22.2		
	System	19	26.4		
	Total	42	58.3		
Total		72	100.0		

<q6> Prior to the program, had you looked into installing energy efficient lighting?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	31	43.1	45.6	45.6
	No	37	51.4	54.4	100.0
	Total	68	94.4	100.0	
Missing	Don't Know	4	5.6		
Total		72	100.0		

<q8> What is the primary element of the program that caused you to install energy efficient lighting now?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	The rebate	6	8.3	9.1	9.1
	Installer oversight	1	1.4	1.5	10.6
	Program convinced me about payback	2	2.8	3.0	13.6
	Program appealed to environmental desires	1	1.4	1.5	15.2
	I didn't have to pay much	10	13.9	15.2	30.3
	Other	46	63.9	69.7	100.0
	Total	66	91.7	100.0	
Missing	Don't Know	6	8.3		
Total		72	100.0		

<q9> Do you own or lease other facilities similar to the one where the energy efficient lighting is installed?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	13	18.1	18.3	18.3
	No	58	80.6	81.7	100.0
	Total	71	98.6	100.0	
Missing	Don't Know	1	1.4		
Total		72	100.0		

<q10> Is energy efficient lighting currently installed in any of those facilities?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	9	12.5	75.0	75.0
	No	3	4.2	25.0	100.0
	Total	12	16.7	100.0	
Missing	-100	1	1.4		
	-99	58	80.6		
	Don't Know	1	1.4		
	Total	60	83.3		
Total		72	100.0		

<q11> Were rebates received for some or all of these lighting retrofits under the LightWash Program?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	7	9.7	77.8	77.8
	No	2	2.8	22.2	100.0
	Total	9	12.5	100.0	
Missing	-100	1	1.4		
	System	62	86.1		
	Total	63	87.5		
Total		72	100.0		

<q13> Did participating in the program change your attitudes about energy efficiency in general?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	44	61.1	66.7	66.7
	No	22	30.6	33.3	100.0
	Total	66	91.7	100.0	
Missing	Don't Know	6	8.3		
Total		72	100.0		

<q19> Your facility was also eligible for rebates to replace your current clothes washers with high efficiency clothes washers. Did you know this?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	23	31.9	85.2	85.2
	No	4	5.6	14.8	100.0
	Total	27	37.5	100.0	
Missing	-99	2	2.8		
	System	43	59.7		
	Total	45	62.5		
Total		72	100.0		

<q20> Was your decision to install EE lighting influenced by the washer component of the program?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	10	13.9	45.5	45.5
	No	12	16.7	54.5	100.0
	Total	22	30.6	100.0	
Missing	-100	2	2.8		
	Don't Know	1	1.4		
	System	47	65.3		
	Total	50	69.4		
Total		72	100.0		

<bus_type>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Laundromat	29	40.3	40.3	40.3
	Office	1	1.4	1.4	41.7
	Restaurant	10	13.9	13.9	55.6
	Retail	32	44.4	44.4	100.0
	Total	72	100.0	100.0	

Statistics

		<percent> Percent of the sites received rebates for as indicated received in q12c04	<q14> How would you rate your attitude about energy efficiency in general? Where 1=Not at all Positive and 4=Very Positive.	<q15> Prior to participating in the program, how would you rate your attitude about energy efficiency in general? Where 1=Not at all Positive and 4=Very Positive.	<q16> AFTER participating in the program, how would you rate your attitude about energy efficiency in general? Where 1=Not at all Positive and 4=Very Positive.	<q17a> Given your experience with the energy efficient lights, would you purchase EE lights when needed if the current rebates were available?	<q17b> Given your experience with the energy efficient lights, would you purchase high EE lights if HALF of the current level of rebates is available?	<q17c> Given your experience with the energy efficient lights, would you purchase EE lights when needed if there were no rebates available?
N	Valid	0	25	44	44	70	68	66
	Missing	72	47	28	28	2	4	6
Mean			3.68	3.32	3.66	3.69	3.07	2.65
Std. Error of Mean			.111	.121	.079	.063	.099	.117

<percent> Percent of the sites received rebates for as indicated received in q12c04

		Frequency	Percent
Missing	System	72	100.0

<q14> How would you rate your attitude about energy efficiency in general? Where 1=Not at all Positive and 4=Very Positive.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	1.4	4.0	4.0
	3	6	8.3	24.0	28.0
	Very Positive	18	25.0	72.0	100.0
	Total	25	34.7	100.0	
Missing	Don't Know	3	4.2		
	System	44	61.1		
	Total	47	65.3		
Total		72	100.0		

<q15> Prior to participating in the program, how would you rate your attitude about energy efficiency in general? Where 1=Not at all Positive and 4=Very Positive.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not At All Positive	1	1.4	2.3	2.3
	2	6	8.3	13.6	15.9
	3	15	20.8	34.1	50.0
	Very Positive	22	30.6	50.0	100.0
	Total	44	61.1	100.0	
Missing	System	28	38.9		
Total		72	100.0		

<q16> AFTER participating in the program, how would you rate your attitude about energy efficiency in general? Where 1=Not at all Positive and 4=Very Positive.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	1.4	2.3	2.3
	3	13	18.1	29.5	31.8
	Very Positive	30	41.7	68.2	100.0
	Total	44	61.1	100.0	
Missing	System	28	38.9		

Total	72	100.0		

<q17a> Given your experience with the energy efficient lights, would you purchase EE lights when needed if the current rebates were available?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Probably Would Not	1	1.4	1.4	1.4
	Probably Would	21	29.2	30.0	31.4
	Definitely Would	47	65.3	67.1	98.6
	Not Applicable	1	1.4	1.4	100.0
	Total	70	97.2	100.0	
Missing	Don't Know	2	2.8		
Total		72	100.0		

<q17b> Given your experience with the energy efficient lights, would you purchase high EE lights if HALF of the current level of rebates is available?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Definitely Would Not	5	6.9	7.4	7.4
	Probably Would Not	5	6.9	7.4	14.7
	Probably Would	38	52.8	55.9	70.6

	Definitely Would	20	27.8	29.4	100.0
	Total	68	94.4	100.0	
Missing	**Don't Know**	4	5.6		
Total		72	100.0		

<q17c> Given your experience with the energy efficient lights, would you purchase EE lights when needed if there were no rebates available?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Definitely Would Not	10	13.9	15.2	15.2
	Probably Would Not	15	20.8	22.7	37.9
	Probably Would	29	40.3	43.9	81.8
	Definitely Would	12	16.7	18.2	100.0
	Total	66	91.7	100.0	
Missing	Refused	1	1.4		
	Don't Know	5	6.9		
	Total	6	8.3		
Total		72	100.0		

Multiple Response

```
Group $Q5GROUP
How did you hear about the rebate?     (Value tabulated = 1)
Pct of  Pct ofDichotomy label

Name       Count  Responses  Cases
<q5c01> Presentation/brochure at trade s Q5C01          8      9.6     11.1
<q5c03> Advertisement or article in a tr Q5C03          5      6.0      6.9
<q5c04> Recruited by a person coming int Q5C04         28     33.7     38.9
<q5c05> From a postcard or letter mailed Q5C05          1      1.2      1.4
<q5c06> From the property manager        Q5C06          1      1.2      1.4
<q5c07> From a colleage or adjacent busi Q5C07         21     25.3     29.2
<q5c77> Other                            Q5C77         15     18.1     20.8
<q5c99> Don't Know                       Q5C99          4      4.8      5.6
                                                 -------    -----    -----
               Total responses       83    100.0    115.30 missing cases;  72 valid cases

Group $Q7GROUP
Why hadn't you installed EE light'g bfr?     (Value tabulated = 1)
Pct of  Pct ofDichotomy label
Name       Count  Responses  Cases
<q7c01> The installation cost was too hi Q7C01         10     26.3     28.6
<q7c03> I was too busy to figure it out  Q7C03          3      7.9      8.6
<q7c04> I wasn't sure the payback was th Q7C04          3      7.9      8.6
<q7c77> Other                            Q7C77         16     42.1     45.7
<q7c99> Don't Know                       Q7C99          6     15.8     17.1
-------    -----    -----
                          Total responses       38    100.0    108.637 missing cases;  35 valid cases

Group $Q12GRP  Why didn't you install EE lighting?     (Value tabulated = 1)
Pct of  Pct ofDichotomy label
Name       Count  Responses  CasesAll cases for this variable/group were missing.72 missing cases;  0 valid
cases
```

```
Group $Q18GRP  Why wouldn't you buy EE lghts in future?     (Value tabulated = 1)
Pct of  Pct ofDichotomy label
Name       Count  Responses  Cases
<q18c02> The replacement lamps are more  Q18C02         1     10.0     10.0
<q18c03> The savings are not as large as Q18C03         1     10.0     10.0
<q18c77> Other                           Q18C77         7     70.0     70.0
<q18c99> Don't Know                      Q18C99         1     10.0     10.0
-------    -----    -----
                      Total responses       10    100.0    100.062 missing cases;  10 valid cases

Group $Q21GRP  How did the washer prog influence you?     (Value tabulated = 1)
Pct of  Pct ofDichotomy label
Name       Count  Responses  Cases
<q21c01> The possible washer retrofit ma Q21C01         5     41.7     50.0
<q21c02> Washer savings made me inquire  Q21C02         1      8.3     10.0
<q21c77> Other                           Q21C77         4     33.3     40.0
<q21c99> Don't Know                      Q21C99         2     16.7     20.0
-------    -----    -----
                        Total responses       12    100.0    120.062 missing cases;  10 valid cases
```

Washer Participants

Notes		
Output Created		30-APR-2004 15:31:17
Comments		
Input	**Data**	Macintosh HD:Users:abjones:Documents:Vanward Consulting:Equipoise:LightWash Evaluation:Data Analysis:Working Data Files:Washer Survey:Washer Data File_main file 1.sav
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	70
Missing Value Handling	**Definition of Missing**	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data.
Syntax		FREQUENCIES VARIABLES=laundrom strata q1 q2 q3 q4 q5 q6 q8 q9 q10wa q10ea q10ga q10wb q10eb q10gb q10wc q10ec q10gc q12 q14 q15 q18 q20 q21 q23 q25 q31 q32 water rgas2 relect2 rown2 part cust bus_type /ORDER= ANALYSIS .
Resources	**Total Values Allowed**	149796
	Elapsed Time	0:00:00.00

		<laundrom> Is your facility a laundromat?	<q1>	<q2>	<q3>	<q4>	<q5>	<q6>	<q8>	<q9>	<q10wa>	<q10ea>	<q10ga>	<q10wb>	<q10eb>	<q10gb>	<q10wc>	<q10ec>	<q10gc>	<q12>	<q14>	<q15>	<q18>	<q20>	<q21>	<q23>	<q25>	<q31>	<q32>?	<part> Did you participate in the lighting program?	<bus_type> What type of business is at this location?
N	Valid	70	70	0	70	21	20	6	27	70	45	46	46	25	19	18	18	10	6	63	30	68	58	70	43	27	66	4	3	70	70
	Missing	0	0	70	0	49	50	64	43	0	25	24	24	45	51	52	52	60	64	7	40	2	12	0	27	43	4	66	67	0	0

<laundrom> Is your facility a laundromat?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Other	57	81.4	81.4	81.4
	Laundromat	13	18.6	18.6	100.0
	Total	70	100.0	100.0	

<strata> What is the name of your utility company?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PG&E	21	30.0	30.0	30.0
	SoCal	33	47.1	47.1	77.1
	SDG&E	16	22.9	22.9	100.0
	Total	70	100.0	100.0	

<q1> Rebated high efficiency clothes washers were installed. Is the facility type correct facility?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	70	100.0	100.0	100.0

<q2> How would you characterize the site here the clothes washers were installed?			
		Frequency	Percent
Missing	System	70	100.0

<q3> Who purchased/owns the rebated high efficiency clothes washer for your facility?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A route operator	21	30.0	30.0	30.0
	The building owner	34	48.6	48.6	78.6
	The homeowners association	3	4.3	4.3	82.9
	The property managment company	1	1.4	1.4	84.3
	Other	11	15.7	15.7	100.0
	Total	70	100.0	100.0	

<q4> What is the name of your route operator?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PWS	1	1.4	4.8	4.8
	CoinMach	6	8.6	28.6	33.3
	Consol Smart Systs LA	1	1.4	4.8	38.1
	Washtek Inc	1	1.4	4.8	42.9
	Web Service Co	12	17.1	57.1	100.0
	Total	21	30.0	100.0	
Missing	System	49	70.0		
Total		70	100.0		

<q5> Did the route operator request changes in the contractor terms b/c of the purchase of the clothes washers?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	6	8.6	30.0	30.0
	No	14	20.0	70.0	100.0
	Total	20	28.6	100.0	
Missing	DK	1	1.4		
	System	49	70.0		
	Total	50	71.4		
Total		70	100.0		

<q6> Was the contract changed as a result of the purchase of the clothes washers?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	5	7.1	83.3	83.3
	No	1	1.4	16.7	100.0
	Total	6	8.6	100.0	
Missing	System	64	91.4		
Total		70	100.0		

<q8> How did you estimate that number?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Based on the coin box revenues	11	15.7	40.7	40.7
	A guess based on your knowledge of the machines	15	21.4	55.6	96.3
	Something Else	1	1.4	3.7	100.0
	Total	27	38.6	100.0	
Missing	System	43	61.4		
Total		70	100.0		

<q9> Are you the person who sees or pays the utility bills for this facility?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	48	68.6	68.6	68.6
	No	22	31.4	31.4	100.0
	Total	70	100.0	100.0	

<q10wa> Do you look at your water bill closely enough to identify changes in the monthly cost?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	27	38.6	60.0	60.0
	No	11	15.7	24.4	84.4
	To Soon to Tell	7	10.0	15.6	100.0
	Total	45	64.3	100.0	
Missing	DK	3	4.3		
	System	22	31.4		
	Total	25	35.7		
Total		70	100.0		

<q10ea> Do you look at your electric bill closely enough to identify changes in the monthly cost?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	22	31.4	47.8	47.8
	No	17	24.3	37.0	84.8
	To Soon to Tell	7	10.0	15.2	100.0
	Total	46	65.7	100.0	
Missing	DK	2	2.9		
	System	22	31.4		
	Total	24	34.3		
Total		70	100.0		

<q10ga> Do you look at your gas bill closely enough to identify changes in the monthly cost?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	20	28.6	43.5	43.5
	No	19	27.1	41.3	84.8
	To Soon to Tell	7	10.0	15.2	100.0
	Total	46	65.7	100.0	
Missing	DK	2	2.9		
	System	22	31.4		
	Total	24	34.3		
Total		70	100.0		

<q10wb> After the high efficiency clothes washers were installed, did you notice a reduction in your water bill?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	18	25.7	72.0	72.0
	No	7	10.0	28.0	100.0
	Total	25	35.7	100.0	
Missing	DK	2	2.9		
	System	43	61.4		
	Total	45	64.3		
Total		70	100.0		

<q10eb> After the high efficiency clothes washers were installed, did you notice a reduction in your electric bill?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	10	14.3	52.6	52.6
	No	9	12.9	47.4	100.0
	Total	19	27.1	100.0	
Missing	DK	3	4.3		
	System	48	68.6		
	Total	51	72.9		
Total		70	100.0		

<q10gb> After the high efficiency clothes washers were installed, did you notice a reduction in your gas bill?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	6	8.6	33.3	33.3
	No	12	17.1	66.7	100.0
	Total	18	25.7	100.0	
Missing	DK	2	2.9		
	System	50	71.4		
	Total	52	74.3		
Total		70	100.0		

<q10wc> Would you consider the reduction you saw in your water bill to be large medium or small?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Large	3	4.3	16.7	16.7
	Medium	8	11.4	44.4	61.1
	Small	7	10.0	38.9	100.0
	Total	18	25.7	100.0	
Missing	-99	2	2.9		
	System	50	71.4		
	Total	52	74.3		
Total		70	100.0		

<q10ec> Would you consider the reduction you saw in your electric bill to be large medium or small?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Large	1	1.4	10.0	10.0
	Medium	2	2.9	20.0	30.0
	Small	7	10.0	70.0	100.0
	Total	10	14.3	100.0	
Missing	-99	3	4.3		
	System	57	81.4		
	Total	60	85.7		
Total		70	100.0		

<q10gc> Would you consider the reduction you saw in your gas bill to be large medium or small?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Medium	3	4.3	50.0	50.0
	Small	3	4.3	50.0	100.0
	Total	6	8.6	100.0	
Missing	-99	2	2.9		
	System	62	88.6		
	Total	64	91.4		
Total		70	100.0		

<q12> Do you remember seeing advertisements about the possible percentage reductions in your utility bills?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	30	42.9	47.6	47.6
	No	33	47.1	52.4	100.0
	Total	63	90.0	100.0	
Missing	DK	7	10.0		
Total		70	100.0		

<q14> Of the water and energy savings indicated in many of the advertisements, which is more important to you?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Water savings	15	21.4	50.0	50.0
	Energy Savings	6	8.6	20.0	70.0
	Both were of equal importance	9	12.9	30.0	100.0
	Total	30	42.9	100.0	
Missing	-99	7	10.0		
	System	33	47.1		
	Total	40	57.1		
Total		70	100.0		

<q15> Have you ever heard of energy star labeled clothes washers?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	45	64.3	66.2	66.2
	No	23	32.9	33.8	100.0
	Total	68	97.1	100.0	
Missing	DK	2	2.9		
Total		70	100.0		

<q18> Prior to hearing about the program, had you looked into the possibility of installing high efficiency clothes washers?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	25	35.7	43.1	43.1
	No	33	47.1	56.9	100.0
	Total	58	82.9	100.0	
Missing	DK	3	4.3		
	System	9	12.9		
	Total	12	17.1		
Total		70	100.0		

<q20> Do you own or manage other facilities with clothes washers?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	45	64.3	64.3	64.3
	No	25	35.7	35.7	100.0
	Total	70	100.0	100.0	

<q21> Are high efficiency washing machines currently installed in any of the sites?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	28	40.0	65.1	65.1
	No	15	21.4	34.9	100.0
	Total	43	61.4	100.0	
Missing	DK	2	2.9		
	System	25	35.7		
	Total	27	38.6		
Total		70	100.0		

<q23> Were rebates received for all of these washers?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	17	24.3	63.0	63.0
	No	10	14.3	37.0	100.0
	Total	27	38.6	100.0	
Missing	-99	2	2.9		
	DK	1	1.4		
	System	40	57.1		
	Total	43	61.4		

Total	70	100.0		

<q25> Did your participation in the LW program change your attitudes about EE in general?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Yes**	40	57.1	60.6	60.6
	No	26	37.1	39.4	100.0
	Total	66	94.3	100.0	
Missing	**DK**	4	5.7		
Total		70	100.0		

<q31> Your site may have been eligible to replace your lighting fixtures with energy efficient fixtures in your laundromat. Had you heard of this possibility?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Yes**	4	5.7	100.0	100.0
Missing	**System**	66	94.3		
Total		70	100.0		

<q32> Was your decision to install EE washers in any way influenced by the lighting component of the program?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	3	4.3	100.0	100.0
Missing	DK	1	1.4		
	System	66	94.3		
	Total	67	95.7		
Total		70	100.0		

<water> What is the name of your water utility?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Alameda County Water District	1	1.4	1.4	1.4
	Anaheim	1	1.4	1.4	2.9
	Bellflower-Somerset	1	1.4	1.4	4.3
	California Water Service Co.	1	1.4	1.4	5.7

	Chemeketa Mutual Water Company	1	1.4	1.4	7.1
	City of Escondido	1	1.4	1.4	8.6
	City of Oceanside	1	1.4	1.4	10.0
	City of Poway	1	1.4	1.4	11.4
	City of Redwood City	3	4.3	4.3	15.7
	City of San Diego	11	15.7	15.7	31.4
	City of Tustin	1	1.4	1.4	32.9
	Contra Costa Water District	3	4.3	4.3	37.1
	Downey	1	1.4	1.4	38.6
	East Bay MUD	9	12.9	12.9	51.4
	Eastern Municipal Water District	1	1.4	1.4	52.9
	Fontana Water Company	1	1.4	1.4	54.3
	Fullerton	3	4.3	4.3	58.6
	Garden Grove	1	1.4	1.4	60.0
	Glendale Water & Power	1	1.4	1.4	61.4
	Helix Water District	1	1.4	1.4	62.9
	Hintington Beach	1	1.4	1.4	64.3
	Huntington Beach	1	1.4	1.4	65.7
	LADWP	11	15.7	15.7	81.4
	Laguna Beach County Water	1	1.4	1.4	82.9

	District				
	Monrovia	1	1.4	1.4	84.3
	Otay Water District	1	1.4	1.4	85.7
	San Francisco PUC	2	2.9	2.9	88.6
	San Gabriel Valley Water Company	1	1.4	1.4	90.0
	San Jose Water Company	2	2.9	2.9	92.9
	Santa Ana	1	1.4	1.4	94.3
	Santa Monica	1	1.4	1.4	95.7
	Simi Valley	1	1.4	1.4	97.1
	Southern California Water Co.	1	1.4	1.4	98.6
	Southern California Water	1	1.4	1.4	100.0
	Total	70	100.0	100.0	

<rgas> recode of gas variable

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**PG&E**	19	27.1	27.9	27.9
	SDG&E	16	22.9	23.5	51.5
	SCG	33	47.1	48.5	100.0
	Total	68	97.1	100.0	
Missing	**Not Provided**	2	2.9		
Total		70	100.0		

<relect> recode of elect variable					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PG&E	21	30.0	56.8	56.8
	SDG&E	16	22.9	43.2	100.0
	Total	37	52.9	100.0	
Missing	Not Provided	33	47.1		
Total		70	100.0		

<rown> recode of own variable					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lease	12	17.1	33.3	33.3
	Purchase	24	34.3	66.7	100.0
	Total	36	51.4	100.0	
Missing	Not Provided	34	48.6		
Total		70	100.0		

<part> Did you participate in the lighting program?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	70	100.0	100.0	100.0

<cust> Customer ID -- Lighting Program					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	70	100.0	100.0	100.0

<bus_type> What type of business is at this location?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	business that is not a laundry	1	1.4	1.4	1.4
	Laundromat	13	18.6	18.6	20.0
	multifamily dwelling	56	80.0	80.0	100.0
	Total	70	100.0	100.0	

Statistics															
	<q24pc> Percentage of washers at other locations that received a rebate (see q24c04)	<q7> For the facility we are discussing, what is the average number of the times the typical machine is used each day?	<rq13> recode of q13: Rate your believability of the possible savings where 4=very believeable and 1=Not at all believeable.	<rq16> recode of q16: Prior to seeing the program material on high efficiency clothes washers, how aware were you of their benefits, where 4=Very aware and	<rq17> recode of q17: After reviewing the program material on high efficiency clothes washers, how aware were you of their benefits?	<q22> Approximately how many clothes washers are installed across all of the sites?	<rq26> recode of q26: Would you say you are very, somewhat, not very, or not at all positive about EE in general?	<rq27> recode of q27: Prior to participating in the program, would you say you were very, somewhat, not very, or not at all positive about EE in general?	<rq28> recode of q28: Now, AFTER participating in the program, would you say you were very, somewhat, not very, or not at all positive about EE in general?	<rq29a> recode of rq29a: Based on your experience to date, would you install high efficiency clothes washers when needed if the current level of rebates	<rq29b> recode of q29b: Based on your experience to date, would you install high efficiency clothes washers when needed if HALF OF the current level of rebat	<rq29c> recode of q29c: Based on your experience to date, would you install high efficiency clothes washers when needed EVEN IF THERE WERE NO rebate avail	<rq29d> recode of q29d: Based on your experience to date, would you request your route operator to install high efficiency clothes washers when new washers	<wash> What are the total number of high efficiency washers installed.?

					1=Not at all aware?					were available?	es were available?	able?	are needed?	
N	Valid	0	27	29	69	61	23	28	39	39	67	63	64	0	70
	Missing	70	43	41	1	9	47	42	31	31	3	7	6	70	0
Mean			5.96	3.5172	2.9275	3.5902	22.87	3.7500	3.3590	3.7436	3.7313	3.0159	2.6406		8.43
Std. Error of Mean			.964	.09443	.10592	.06349	4.927	.08333	.10702	.07083	.06918	.10490	.11217		1.530

<q24pc> Percentage of washers at other locations that received a rebate (see q24c04)

		Frequency	Percent
Missing	System	70	100.0

<q7> For the facility we are discussing, what is the average number of the times the typical machine is used each day?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1	1.4	3.7	3.7
	2	6	8.6	22.2	25.9
	3	3	4.3	11.1	37.0
	4	2	2.9	7.4	44.4
	5	7	10.0	25.9	70.4
	6	1	1.4	3.7	74.1
	7	1	1.4	3.7	77.8
	10	3	4.3	11.1	88.9
	13	1	1.4	3.7	92.6
	20	2	2.9	7.4	100.0
	Total	27	38.6	100.0	
Missing	DK	43	61.4		
Total		70	100.0		

<rq13> recode of q13: Rate your believability of the possible savings where 4=very believable and 1=Not at all believable.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat believable	14	20.0	48.3	48.3
	Very Believable	15	21.4	51.7	100.0
	Total	29	41.4	100.0	
Missing	DK	1	1.4		
	System	40	57.1		
	Total	41	58.6		
Total		70	100.0		

<rq16> recode of q16: Prior to seeing the program material on high efficiency clothes washers, how aware were you of their benefits, where 4=Very aware and 1=Not at all aware?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all aware	7	10.0	10.1	10.1
	Not very aware	8	11.4	11.6	21.7
	Somewhat aware	37	52.9	53.6	75.4
	Very aware	17	24.3	24.6	100.0
	Total	69	98.6	100.0	
Missing	DK	1	1.4		
Total		70	100.0		

<rq17> recode of q17: After reviewing the program material on high efficiency clothes washers, how aware were you of their benefits?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat aware	25	35.7	41.0	41.0
	Very aware	36	51.4	59.0	100.0
	Total	61	87.1	100.0	
Missing	DK	1	1.4		
	System	8	11.4		
	Total	9	12.9		
Total		70	100.0		

<q22> Approximately how many clothes washers are installed across all of the sites?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	3	4.3	13.0	13.0
	5	1	1.4	4.3	17.4
	7	1	1.4	4.3	21.7
	9	3	4.3	13.0	34.8
	10	2	2.9	8.7	43.5
	14	1	1.4	4.3	47.8
	16	1	1.4	4.3	52.2
	20	1	1.4	4.3	56.5
	22	1	1.4	4.3	60.9
	23	1	1.4	4.3	65.2
	24	1	1.4	4.3	69.6
	25	2	2.9	8.7	78.3
	40	2	2.9	8.7	87.0
	45	1	1.4	4.3	91.3
	62	1	1.4	4.3	95.7
	105	1	1.4	4.3	100.0
	Total	23	32.9	100.0	

Missing	**-99**	2	2.9		
	DK	5	7.1		
	System	40	57.1		
	Total	47	67.1		
Total		70	100.0		

<rq26> recode of q26: Would you say you are very, somewhat, not very, or not at all positive about EE in general?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Somewhat positive**	7	10.0	25.0	25.0
	Very positive	21	30.0	75.0	100.0
	Total	28	40.0	100.0	
Missing	**Refused**	1	1.4		
	DK	1	1.4		
	System	40	57.1		
	Total	42	60.0		
Total		70	100.0		

<rq27> recode of q27: Prior to participating in the program, would you say you were very, somewhat, not very, or not at all positive about EE in general?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not very positive	4	5.7	10.3	10.3
	Somewhat positive	17	24.3	43.6	53.8
	Very positive	18	25.7	46.2	100.0
	Total	39	55.7	100.0	
Missing	DK	1	1.4		
	System	30	42.9		
	Total	31	44.3		
Total		70	100.0		

<rq28> recode of q28: Now, AFTER participating in the program, would you say you were very, somewhat, not very, or not at all positive about EE in general?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat positive	10	14.3	25.6	25.6
	Very positive	29	41.4	74.4	100.0
	Total	39	55.7	100.0	
Missing	DK	1	1.4		
	System	30	42.9		
	Total	31	44.3		
Total		70	100.0		

<rq29a> recode of rq29a: Based on your experience to date, would you install high efficiency clothes washers when needed if the current level of rebates were available?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Definitely would not	1	1.4	1.5	1.5
	Probably would	16	22.9	23.9	25.4
	Definitely would	49	70.0	73.1	98.5
	NA	1	1.4	1.5	100.0
	Total	67	95.7	100.0	
Missing	DK	3	4.3		
Total		70	100.0		

<rq29b> recode of q29b: Based on your experience to date, would you install high efficiency clothes washers when needed if HALF OF the current level of rebates were available?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Definitely would not	4	5.7	6.3	6.3
	Probably would not	9	12.9	14.3	20.6
	Probably would	32	45.7	50.8	71.4
	Definitely would	18	25.7	28.6	100.0
	Total	63	90.0	100.0	
Missing	Refused	1	1.4		
	DK	5	7.1		
	System	1	1.4		
	Total	7	10.0		
Total		70	100.0		

<rq29c> recode of q29c: Based on your experience to date, would you install high efficiency clothes washers when needed EVEN IF THERE WERE NO rebate available?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Defintely would not	9	12.9	14.1	14.1
	Probably would not	14	20.0	21.9	35.9
	Probably would	32	45.7	50.0	85.9
	Definitely would	9	12.9	14.1	100.0
	Total	64	91.4	100.0	
Missing	DK	5	7.1		
	System	1	1.4		
	Total	6	8.6		
Total		70	100.0		

<rq29d> recode of q29d: Based on your experience to date, would you request your route operator to install high efficiency clothes washers when new washers are needed?

		Frequency	Percent
Missing	DK	1	1.4
	System	69	98.6
	Total	70	100.0

<wash> What are the total number of high efficiency washers installed.?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**1**	20	28.6	28.6	28.6
	2	13	18.6	18.6	47.1
	3	2	2.9	2.9	50.0
	4	6	8.6	8.6	58.6
	8	4	5.7	5.7	64.3
	9	1	1.4	1.4	65.7
	10	5	7.1	7.1	72.9
	11	2	2.9	2.9	75.7
	12	4	5.7	5.7	81.4
	14	1	1.4	1.4	82.9
	15	1	1.4	1.4	84.3
	16	1	1.4	1.4	85.7
	18	1	1.4	1.4	87.1
	19	1	1.4	1.4	88.6
	20	1	1.4	1.4	90.0
	21	1	1.4	1.4	91.4

	22	1	1.4	1.4	92.9
	23	1	1.4	1.4	94.3
	30	1	1.4	1.4	95.7
	32	2	2.9	2.9	98.6
	91	1	1.4	1.4	100.0
	Total	70	100.0	100.0	

Multiple Response – Washer Survey

Notes		
Output Created		30-APR-2004 15:31:27
Comments		
Input	**Data**	Macintosh HD:Users:abjones:Documents:Vanward Consulting:Equipoise:LightWash Evaluation:Data Analysis:Working Data Files:Washer Survey:Washer Data File_main file 1.sav
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	70
Syntax		MULT RESPONSE GROUPS=$q11grp 'How did you hear about the rebate?' (q11c01 q11c02 q11c03 q11c04 q11c05 q11c06 q11c07 q11c08 q11c77 (1)) $q19grp "Why"+ " hadn't you instl'd wash machines b4?" (q19c01 q19c02 q19c03 q19c04 q19c77 (1)) $q24grp "Why didn't you get rebates for all?" (q24c01 q24c02 q24c03 q24c04 q24c05 q24c77 (1)) $q30grp 'Why not'+ ' purchase washers in future?' (q30c01 q30c02 q30c03 q30c04 q30c05 q30c06 q30c77 (1)) $q33grp "How did the light'g progr influence you?" (q33c01 q33c02 q33c77 (1)) /FREQUENCIES=$q11grp $q19grp $q24grp $q30grp $q33grp .
Resources	**Elapsed Time**	0:00:00.00

Group $Q11GRP How did you hear about the rebate? (Value tabulated = 1)

Name	Dichotomy label	Count	Pct of Responses	Pct of Cases
<q11c01> Presentation/brochure at a trad	Q11C01	1	1.3	1.5
<q11c02> The local water utility	Q11C02	4	5.3	6.1
<q11c03> Advertisement in a trade journa	Q11C03	4	5.3	6.1
<q11c04> Article in a trade journal or n	Q11C04	4	5.3	6.1
<q11c06> From my route operator	Q11C06	20	26.7	30.3
<q11c07> From the property manager	Q11C07	2	2.7	3.0
<q11c08> From a coleague	Q11C08	3	4.0	4.5
<q11c77> Other	Q11C77	37	49.3	56.1
Total responses		75	100.0	113.6

4 missing cases; 66 valid cases

Group $Q19GRP Why hadn't you instl'd wash machines b4? (Value tabulated = 1)

Name	Dichotomy label	Count	Pct of Responses	Pct of Cases
<q19c01> It was too costly	Q19C01	3	13.6	13.6
<q19c04> I was not sure it would be wort	Q19C04	1	4.5	4.5
<q19c77> Other	Q19C77	18	81.8	81.8
Total responses		22	100.0	100.0

48 missing cases; 22 valid cases

Group $Q24GRP Why didn't you get rebates for all? (Value tabulated = 1)

Name	Dichotomy label	Count	Pct of Responses	Pct of Cases
<q24c01> They were installed before the	Q24C01	2	15.4	20.0
<q24c02> They were installed before I he	Q24C02	1	7.7	10.0
<q24c05> They were installed outside of	Q24C05	2	15.4	20.0
<q24c77> Other	Q24C77	8	61.5	80.0
Total responses		13	100.0	130.0

60 missing cases; 10 valid cases

Group $Q30GRP Why not purchase washers in future? (Value tabulated = 1)

Name	Dichotomy label	Count	Pct of Responses	Pct of Cases
<q30c01> The maintenance is more expensi	Q30C02	1	6.7	7.7
<q30c01> The savings are not as large as	Q30C03	1	6.7	7.7
<q30c01> The machines require more maint	Q30C06	6	40.0	46.2
<q30c01> The machines are too expensive	Q30C77	7	46.7	53.8
Total responses		15	100.0	115.4

57 missing cases; 13 valid cases

```
Group $Q33GRP  How did the light'g progr influence you?     (Value tabulated = 1)
Pct of  Pct ofDichotomy label
Name       Count  Responses  Cases
All cases for this variable/group were missing.70 missing cases;  0 valid cases
```

F. WASHER ROUTE OPERATOR INTERVIEW RESPONSES

(A -9 indicates a field in which the question was not asked)

Audit ID	Date	Start Time	Stop Time	Audit Type	1	1 other	2	3	4	5	6	7
MCS01	4/16/2004	10:00 AM	10:05	Route Operator	9	From Whirlpool distributor	1	2	2	1	When they call to buy machines, give customers opportunity to purchase	2
MCS07	4/16/2004	1:57 PM	2:15 PM	Route Operator	2; 3; 9	Utility bill inserts too	1	2	1	-9	Don't sell the machines - contract is to share the revenue basis. Some they lease but no customers lease to own. They have 3-5 year contracts. Some property owners tell them to put in new machines, but often reject the changes in the contract that it would entail.	-7
TOC04	4/16/2004	11:00 AM	11:00 AM	Route Operator	9	Manufacturers: Whirlpool	1	2	2	2	I have to be sold myself, customers demand them.	1
TOC05	4/19/2004	8:00 AM	8:12 AM	Route Operator	9	Literature from LightWash	1	2	1	1	Owners are asking for it because they are getting literature. It saves them money and satisfies their conservation ethic	3
TOC06	4/21/2004	12:30 PM	12:42 PM	Route Operator	7	-9	2	-9	-9	-9	They put them in at the request of the building owner. They charge ~$0.50 more per wash for the high efficiency machines.	-7

Audit ID	Date	Start Time	Stop Time	Audit Type	1	1 other	2	3	4	5	6	7
TOC07	4/22/2004	10:32 AM	10:45 AM	Route Operator	2	-9	1	2	2	2	Mostly on energy savings, water sewer. Overall package.	1
TOC08	4/16/2004	10:35 AM	10:52 AM	Route Operator	9	Manufacturers: Whirlpool	1	1	1	1	It is our decision, we control number and type of machine. We don't sell that many. Generally we give builder proposals, and the building owner can make choice. Generally they go in where there is a higher volume of business, in the bay area.	2
TOC09	4/19/2004	8:20 AM	8:35 AM	Route Operator	9	When Lightwash was being considered, I was aware of the Santa Clara program and Ted Pope talked to me.	1	1	2	1	Usually on utility savings. Depends on client. Most are interested in saving money. Sell them on Maytag, utility savings, user saves soap.	3

Audit ID	8	8 Other	9	10	10 other	11	12	13	13 Other	14	15
MCS01	2	Contracts don't have anything to do with the machines installed, Contract is different for new machines, and that is how they cover the additional costs.	1	2	-9	-9	-9	-9	-9	0	-9
MCS07	2	Propose installing EE machines, with changes in contract, but the changes are rejected often by customers, so we don't install the machines.	1	1	-9	2	0%	1; 2	-9	<10%	30
TOC04	2	Don't know what I could renegotiate. I rent the space and own the machines. No reason to renegotiate.	1	2	-9	-9	-9	-9	-9	10%	20%
TOC05	1	Yes in general, but some can support change in machine without changes in the contract.	1	1	-9	1	10-20%	-9	-9	25-50%, depending on the area.	7
TOC06	2	We charge $0.50 per wash	1	2	-9	2	0%	-9	Customers didn't want it, weren't asking for it.	5%	10
TOC07	2	They are big accounts, it works for both sides. Rebate Knocks cost down to top loader	1	1	-9	2	0	5	No one was pushing for them.	80%	200/year

Audit ID	8	8 Other	9	10	10 other	11	12	13	13 Other	14	15
TOC08	1	Depends: Generally contract done with new lease; usually larger places that do really well where we install high efficiency machines.	-9	1	-9	1	-7	-9	-9	-7	-9
TOC09	1	-9	1	1	-9	2	>5%	1	-9	15-20%	-7

Audit ID	16	16Other	17	17 Other	18	19	20	21	22	23	23 Other	24
MCS01	-9	-9	-9	-9	2	2	-9	-9	2	-9	-9	No
MCS07	-7	-9	Don't know if customer got rebate	-9	2	1	-9	-9	2	-9	-9	There is a certain amount of misinformation about how much could be saved. As a route operator, they may install HE machines if the conditions are right. Meaning, 1) the place can justify it, 2) there is a 3 year return on investment (as it takes 3 years before they see any profit), and 3) prices come down. They want a machine to last 10-15 years. Has head that service rates on the new machines are reasonable.

Audit ID	16	16Other	17	17 Other	18	19	20	21	22	23	23 Other	24
TOC04	2	-9	5	The machines were installed in areas where rebates were not offered. Note: This customer had never actually participate in the program, according to him.	-9	2	-9	-9	3	6	We install where customer insisted. Energy efficient machines are having a lot of maintenance problems. These problems are mainly with Whirlpool. Speed Queens are not a problem.	(Note: this customer hadn't actually participated in the program.) When customers need a machine they need it now. The program slows down the process and makes it more difficult. If the price were close and there were a rebate and quality same, I would jump on it.
TOC05	1	-9	-9	-9	2	1	-9	-9	1	-9	-9	Most say put it in, they want to see the savings that the machines offer. No other comments, I think it is good. I hope they continue it.
TOC06	1	-9	-9	-9	2	1	-9	-9	3	1	-9	We would like to see one that works. We think that the machines aren't really of industrial quality, and they are hard to work on. We charge $0.50 more for washes on these machines. We only install them when customers request them. Because of the extra cost these machines get used less. The LightWash people have always been very helpful, they have supplied all the information I need. It is nice to have a person available. Erika has always been helpful.

Audit ID	16	16Other	17	17 Other	18	19	20	21	22	23	23 Other	24
TOC07	2	-9	5	Some were installed areas where the rebates were not offered.	1	-9	4	1	2	-9	-9	Does the rebate still go to the property owner? You see the property owner benefits and we really don't. Popular because water costs $7-8 per 1000 gallons in Marin.
TOC08	-9	-9	-9	-9	2	1	-9	-9	1	-9	-9	Program mainly reinforced what we were already telling our customers.
TOC09	2	-9	5	Some water districts don't participate.	1	-9	3	1	2	-9	-9	San Mateo drastically needs a program. They don't have a participating water district. Really good program! The key is having staff available to address issues and answer the phone. The form has a phone number that they can call, and it is simple. Even the fact that it is in color is important. It is more difficult for them to overlook it. We are a family owned company. And we believe it is in the best interest of the customer to be ahead of the curve. Added Input: Q2. Apartment Magazine and PG&E bill stuffers are most effective. Q7. Money the main factor. Q9. I became aware of Energy Star because of program.

G. WASHER DISTRIBUTOR INTERVIEW RESPONSES

(A -9 indicates a field in which the question was not asked)

Audit ID	Date	Start Time	Stop Time	Audit Type	1	1 other	2	3	4	5	6	7
MCS02	4/16/2004	10:20 AM	10:30 AM	Distributor	9	From Ericka at LightWash	2	-9	-9	-9	-9	1
MCS03	4/16/2004	10:33 AM	10:41 AM	Distributor	9	Mail from the Energy & Gas Industry Association	1	2	1	1	-9	1
MCS04	4/16/2004	10:58 AM	11:15 AM	Distributor	9	From sewer treatment plant representative	2	-9	-9	-9	-9	1
MCS05	4/16/2004	11:57 AM	12:03 PM	Distributor	9	Lightwash	2	-9	-9	-9	-9	1

Audit ID	Date	Start Time	Stop Time	Audit Type	1	1 other	2	3	4	5	6	7
MCS06	4/16/2004	12:18 PM	12:29 PM	Distributor	9	Has been involved with the San Diego water company rebates for the past 4 years. When LightWash partnered with the San Diego group, they learned about LightWash.	1	1	1	1	-9	1
MCS08	4/19/2004	10:51 AM	11:00 AM	Distributor	9	From LightWash staff	1	2	2	1	-9	1
MCS09	4/19/2004	11:26 AM	11:30 AM	Distributor	9	From LightWash staff	2	-9	-9	-9	-9	1
MCS10	4/19/2004	1:41 PM	1:44 PM	Distributor	9	From LightWash staff	1	1	1	1	-9	1
TOC01	4/16/2004	3:00 PM	3:13 PM	Distributor	9	Savabuck, Whirlpool	1	2	7	1	-9	1
TOC02	4/16/2004	3:31 PM	3:38 PM	Distributor	9	Manufacturers: Continental or Maytag	1	1	1	1	-9	1

Audit ID	Date	Start Time	Stop Time	Audit Type	1	1 other	2	3	4	5	6	7
TOC03	4/22/2004	4:47 PM	5:00 PM	Distributor	2	-9	1	1	3	1	-9	1

Audit ID	8	8 Other	9	10	10 other	11	12	13	13 Other	14	15
MCS02	1	-9	1	-9	-9	20%	45%	-9	-9	1	-9
MCS03	1	-9	2	1	-9	10-15%	-7	-9	-9	2	-9
MCS04	2	-9	-9	9	Customer not aware	-9	-9	-9	-9	1	-9
MCS05	1	-9	1	-9	-9	20%-30%	-9	-9	-9	1	Changed the percentages of the top loader that qualified, but didn't know to what extent. Knows that they are still back ordered on the machine.
MCS06	1	-9	2	1	-9	15%	-9	-9	-9	1	60-70% increase in the number of sales of that machine
MCS08	1	-9	-9	1;3;5	-9	80%	-9	-9	-9	Overall sales up ~25%, but don't know if due to	-9

Audit ID	8	8 Other	9	10	10 other	11	12	13	13 Other	14	15
										program.	
MCS09	1	-9	1	-9	-9	20% maybe	-9	-9	-9	2	-9
MCS10	2	-9	-9	1	-9	1%	-9	-9	-9	1	20-25% of what they now sell
TOC01	1	-9	2	6	They were concerned about washing performance	5%	-9	-9	-9	2	-9
TOC02	2	-9	-9	1;3	-9	0%	-9	-9	-9	1	20%
TOC03	1	-9	1	-9	-9	50%	-9	-9	-9	1	70% increase (now 85% of sales)

Audit ID	16	16Other	17	17 Other	18	19	20
MCS02	-9	-9	2	-9	1	-9	-9
MCS03	9	Finds the start/stop of the programs very confusing	2	-9	2	-9	-9

Audit ID	16	16Other	17	17 Other	18	19	20
MCS04	-9	-9	2	-9	1	-9	-9
MCS05	-9	-9	1	-9	-9	1	-9
MCS06	-9	-9	2	-9	1	-9	-9
MCS08	-9	-9	2	-9	1	-9	-9
MCS09	9	Price conscious customers aren't buying them.	1	-9	-9	Didn't think about it	1
MCS10	-9	-9	2	-9	1	-9	-9
TOC01	5	Customers not satisfied with washing performance of our equipment (Whirlpool)	2	-9	1	-9	-9
TOC02	-9	-9	2	-9	1	-9	-9
TOC03	-9	-9	2	-9	1	-9	-9

Audit ID	21	22	23	23 Other	24
MCS02	A negative on the CEE list of potential washers. Some manufacturers have a toggle on the machine. They can qualify the machine, but then change the water usage to higher through the use of the switch (so it isn't the same water factor).	-9	-9	-9	-9
MCS03	The number of agencies involved is large and confusing. The dollar amounts change by area which is confusing as well.	-9	-9	-9	-9
MCS04	Program should offer rebates for larger machines.	-9	-9	-9	-9

Audit ID	21	22	23	23 Other	24
MCS05	No - is a great program. He is involved with the Coin Laundry Association - they are all aware of utility costs and talk about it at just about every meeting. [Not asked, but offered they run their own laundry and have more maintenance issues with front loaders due to customers putting in too much soap. Don't get energy efficiency then.]	-9	-9	-9	-9
MCS06	Without the rebate program, the machines would not be bought. There is confusion due to the multiple players, rebates, and change in the mix of players. The process required is upsetting to customers, but the customers do it with lots of help from distributors. Customers used to coupons and the process is extremely bureaucratic. In defense of the programs, though, agrees with what they do and understands the need for all the paperwork and verification.	-9	-9	-9	-9
MCS08	Light Wash staff they have dealt with are helpful and knowledgeable. Some of it is educating the owners and it is nice to get the information from a source outside of the salesman (i.e., from LightWash)	-9	-9	-9	-9
MCS09	-9	-9	-9	-9	-9
MCS10	No- is a good program. Don't think that the machines would sell as well without it.	-9	-9	-9	-9
TOC01	Q14. Not with our equipment, Q17. I think energy efficiency is good, but the machines have to do a good job of washing and current Whirlpool machines don't., Whirlpool needs to redesign their machines so they both wash well and are energy efficient. They are working on a large front loader that will do that. I am not negative about energy efficiency, but we have to sell quality products or we don't stay in business. So we are honest with our customers about the washing performance of the Whirlpool high efficiency machines, which isn't as good as regular efficiency machines. Some machines can be reset to void the energy efficiency. They say that they know this is true because they have a service department who can verify it. Mainly people want to buy a machine that is good for the business, the don't want to buy high efficiency machines because they are concerned they won't wash well. And we pretty much agree with them for Whirlpool. Other brands are good but not Whirlpool.	-9	-9	-9	-9

Audit ID	21	22	23	23 Other	24
TOC02	Q4. Most are going to Apartments, they are concerned about water because it is expensive here in Marin. Q21. Haven't heard any complaints from customers. It helps get us customers. (Keep it up. This company sells Maytag and Continental.)	-9	-9	-9	-9
TOC03	The program should sponsor larger horizontal axis soft mount washers. Can spin more water out and save gas. Wash is faster and controls are more sophisticated. East coast ahead of west coast. More aware of benefits. The marketing of LightWash made sales easier. It validated the sales speech for the buyer. 30% of site revenue goes into utilities, so EE is important. Customer demand is higher now program is available. News of program availability is spread by (1) Word of mouth, (2) Coin laundry association, (3) Operators expounding virtues, (4) LighWash Mailers. When asked what would improve program he suggested (1) Work with Coin Laundry Association, and (2) More/bigger advertising push. Overall program is EXCELLENT!	-9	-9	-9	-9

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H. ON-SITE INSPECTION DEVIATION RECORDS

=Audited Measure
=Ratio based on audited measure

Measure Name	Expected N	Found N	Difference	Percent Found	Onsite Measure Used for Non-audited Measure
1X2 2L WRAP	1	1	0	100%	
1X4 1L WRAP	5	4	-1	80%	
1X4' 2L INDUSTRIAL STRIP	3	3	0	100%	
1X4 2L WRAP	13	12	-1	92%	
1X4 4L WRAP		Audited Measure Ratio		100%	15
1X8' 4L INDUSTRIAL STRIP	38	38	0	100%	
1X8 4L WRAP	4	4	0	100%	
2' 1L STRIP	1	1	0	100%	
2' 2L STRIP	1	1	0	100%	
2-PC 15 watt Screw-in CFL	34	16	-18	47%	
2-PC 18 watt Screw-in CFL	35	23	-12	66%	
2-PC 23 watt Screw-in CFL	31	28	-3	90%	
2X2 W/ 2 F17T8	1	1	0	100%	
2X2 W/ 2 F17T8/REFL	21	21	0	100%	
2X4 3L MASTER/SLAVE		Audited Measure Ratio		100%	20
2X4 3L W/ 2L REFLECTOR		Audited Measure Ratio		100%	20
2X4 4L W/ 2L REFLECTOR	2	2	0	100%	
2X4 4L W/ TWO BALLASTS	64	64	0	100%	
2X4 W/ 2LF32T8/ HO Ballast	84	84	0	100%	
2X4 W/ 2LF32T8/3 lamp ballast	110	109	-1	99%	
2X4 W/ 2LF32T8/800	172	172	0	100%	

Measure Name	Expected N	Found N	Difference	Percent Found	Onsite Measure Used for Non-audited Measure
2X4 W/ ONE 3-LAMP BALLAST		Audited Measure Ratio		100%	20
2X4 W/ ONE 4-LAMP BALLAST	27	27	0	100%	
2X4 W/ TWO BALLASTS		Audited Measure Ratio		100%	15
2X4 W/3L F32T8/3 lamp ballast	53	53	0	100%	
2X4 W/4L F32T8/4 lamp	48	48	0	100%	
3' 2L STRIP	1	1	0	100%	
4' 1L STRIP	45	39	-6	87%	
4' 2L STRIP	21	21	0	100%	
42W CFL Flood		Audited Measure Ratio		100%	37
6' HO Retro Kit w/ 1, 4' T8 TG /2L ballast	2	2	0	100%	
6' HO Retro Kit w/ 1, 6' T8 TG		Audited Measure Ratio		100%	25
8' 1-LAMP T8 LAMP AND BALLAST		Audited Measure Ratio		100%	26
8' 2-LAMP T8 LAMP AND BALLA ST		Audited Measure Ratio		100%	26
8' 2-LAMP T8 LAMP AND HO BALLAST	18	18	0	100%	
8' HO w/ Modified Strip 2, 4' lamps	7	7	0	100%	
8' Modified STRIPKIT W/ 2, 4' LAMPS	42	42	0	100%	
8' Modified STRIPKIT W/ 2, 4' LAMPS 3L BALLAST	79	81	2	103%	
8' Modified STRIPKIT W/ 2, 4' LAMPS HO BALLAST	85	86	1	101%	
8' Modified STRIPKIT W/ 3, 4' LAMPS		Audited Measure Ratio		100%	34
8' Modified STRIPKIT W/ 4, 4' LAMPS	31	31	0	100%	
8' RETRO IND. KIT W/ 2, 4' LAMPS		Audited Measure Ratio		100%	32
8' RETRO IND. KIT W/ 2, 4' LAMPS 3L BALLAST		Audited Measure Ratio		100%	32
8' RETRO IND. KIT W/ 4, 4' LAMPS		Audited Measure Ratio		100%	34
8' RETRO STRIPKIT W/ 2, 4' LAMPS	2	2	0	100%	
8' RETRO STRIPKIT W/ 2, 4' LAMPS 3L BALLAST		Audited Measure Ratio		103%	29
8' RETRO STRIPKIT W/ 2, 4' LAMPS HO BALLAST	38	38	0	100%	
8' RETRO STRIPKIT W/ 4, 4' LAMPS	21	21	0	100%	
8' STRIP W/ 2, 4' LAMPS		Audited Measure Ratio		100%	32

Measure Name	Expected N	Found N	Difference	Percent Found	Onsite Measure Used for Non-audited Measure
Ceiling-mounted Occupancy Sensor		No Audited Measure		100%	
New 8' modified strip fixture w/ 4 4-foot lamp		Audited Measure Ratio		100%	31
New 8' Strip fixture w/ 2 4-foot lamp	21	20	-1	95%	
New 1x13 CFL Wall Pack Fixture	1	1	0	100%	
New 2' 1-lamp strip fixture W/reflector		Audited Measure Ratio		100%	7, 8
New 2x13 CFL Drum Fixture	2	2	0	100%	
New 2X13 CFL Flood Fixt (silver or black)		Audited Measure Ratio			37
New 4' 1-lamp fixture W/reflector	3	3	0	100%	
New 4' 2-lamp strip fixture replacing existing 2 lamp strip	4	4	0	100%	
New 4' 2-lamp wrap fixture replacing existing 2 lamp strip		Audited Measure Ratio		100%	39
New 4' 2-lamp wrap fixture replacing incandescent	7	7	0	100%	
New 8' strip fixture w/ 2- 4'lamps replacing incand.		Audited Measure Ratio		100%	40
New 8' Wrap fixt w/ 2, 4' lamps and security diffuser	20	22	2	110%	
NEW LED EXIT AC ONLY		Audited Measure Ratio		100%	42
NEW LED EXIT W/ BATTERY	13	13	0	100%	
NEW LED EXIT W/ BUG-EYES		Audited Measure Ratio		100%	42
Permanent Removal of 2' Lamp		Unable to Audit		100%	
Permanent Removal of 4' Lamp		Unable to Audit		100%	
Permanent Removal of 8' Lamp		Unable to Audit		100%	
Two 2x4 2LF32T8/800 w/one 4L BALLAST	40	40	0	100%	