

DATA COLLECTION

Nexant will use a secure, Internet-based, on-line, data, upload process called the DR-Tool. The DR-Tool allows for data storage, input and analyses. Data storage is done in two stages. The program participant database (PPD) contains all the information about program administrators, participating facilities and their assigned meters and metering capabilities. The meter data database (MDD) contains numerical data pertaining to each 15-minute interval meter identified in the PPD. The PPD and MDD are integrated in such a way that only meter data pertaining to an existing participant in the PPD may be stored. That is, meter data is uniquely associated with an existing participant in the PPD. Data input is performed online by program administrators using web-enabled “Landing Zone” software which provides on-line forms for uploading participant and 15-minute interval meter data into the PPD and MDD.

Each PA will be provided access to the secure web site (<http://efficiencylink.com>) via a user name and password. Upon logging in the program, administrator must first enter participant data into the PPD and then upload meter data for specified curtailment events into the MDD. Detailed descriptions of the data upload process and required data fields are provided at this web location, under “Help”.

The PPD forms the basis for all the sampling, queries, audits and subsequent analyses and reporting for all the qualitative objectives of the MV&E plan. The supporting meter data in the MDD provides answers to all the quantitative objectives of the plan, and the integration of the MDD. All meter data pertaining to events will be obtained from the program administrator for each of the participants forming the sample. Requirements for meter data from each participant may be relaxed if it is determined that aggregate meter data for the population or sampled sub-population is sufficient to address the MV&E objectives.

Once all the relevant information is collected in the PPD, a sample will be drawn based on the 80/20 sampling criteria and data analyses will either be performed on a case-by-case basis using the corresponding meter data from the MDD, or by analysis of aggregated meter data. The next step will involve calculation of realization rates and drawing inferences to the entire population. Sampling will not be necessary if meter data is available for the entire program population.

DATA ANALYSIS-SAMPLING PLAN AND STATISTICAL ANALYSIS

Data collected in the PPD is relevant to the statistical analyses, as it allows characterization of the program population and population segmentation based on load usage, geographic location, building type etc.. The PPD provides necessary data to carry out a random stratified sampling regime, if required.

An 80/20 reliability level is used as a target for accuracy for estimates of the whole population. This criterion assures that there will be an 80 percent probability that the actual demand and energy savings achieved by the sites will be within 20 percent of the estimate. This target level of accuracy will be exceeded in the event that meter data is available for entire populations.

Because of the size differences between subgroups, and the likelihood of incomplete data, the 80/20 criteria for estimate quality will not be attempted in the analysis of specific segments of the population. To determine the necessary sample size of sites, Equations (6) is used:

$$n = \frac{z^2 \times cv(y)^2}{p^2}$$

(6)

$$n^* = \frac{Nn}{(N + n)}$$

Where:

n	=	Sample size for an infinite population
n*	=	Required sample size based on finite population correction; values of n* should be rounded up to the next higher integer.
z	=	z-statistic (equal to 1.282 for an 80% confidence level)
C _v (y)	=	Coefficient of variation of hours of use y (assumed to be 0.5 in this case)
p	=	The required precision level (set at 20%)

These equations are also applied to each of the four programs to determine if it is possible to generate estimates within the criteria. In order to achieve 80/20 in estimating the demand reduction, a “z” value of 1.282 and a “p” value of 0.2 are constants used above. The actual sample size for the population and subgroup analyses will be determined upon selection of the final population of participants.

CALCULATION OF DEMAND SAVINGS

For each of the chosen participants, demand savings are calculated using methods described above for calculating demand savings. Depending on the program, demand savings are calculated in response to critical and non-critical curtailment signals.

COST EFFECTIVENESS ANALYSIS

Included as one of the research objectives, the cost-effectiveness analysis is considered to be of critical importance to the CEC. Using the total costs invoiced and incurred by the CEC, Nexant will calculate a figure that will result in a dollar cost for achieving a unit of demand savings (kW) for the different program administrators and for the program as a whole.

Important, but secondary is the evaluation of participation rates, the related topics of free-driver/free rider and the potential for double counting savings. While these issues will be addressed if discovered as part of the analysis, Nexant’s emphasis is on program impacts. Therefore, any findings around these issues will be anecdotal rather than quantitative in nature.

MV&E REPORTING

Nexant’s final report will consist of the results of all MV&E activities. Quarterly reports will describe the progress made toward MV&E objectives each quarter.

CONCLUSION

Verification of demand savings will be performed separately for critical and non-critical curtailments. Temperature-load adjusted baseline methods are proposed for the calculation of demand savings for curtailment events involving CAC systems that respond to critical signals including SMUD's dynamic TOU price and other emergency signals from SMUD's RCTP program and the CAISO.

Answers to all quantitative questions in the objectives will be obtained by analysis of participant and meter data within the PPD and MDD. If population sampling is required to complete Nexant's analysis, all inferences and generalizations drawn from sampled subpopulations will be supported by statistical analyses at an 80/20 level of statistical accuracy for the entire sub-element 4 population.

All qualitative answers to the objectives will be addressed by the solicited information in the PPD. Missing data in the PPD will be augmented by supplementary questions in participant and administrator audits.

APPENDIX B

SUB-ELEMENT 3 AND 4 AUDIT FORMS

SUB-ELEMENT 3 AUDIT FORMS

Shown below are a series of questions that were asked to both program administrators and participants of Sub-element 3 programs.

Program Administrator Audits (SE.3)

1. Describe how you recruited participants?
2. What marketing materials did you use to attract participants?
3. How many participants did you sign up?
(___ customers ___ facilities recorded by Nexant to date)
4. From these participants, what did you reported in total MW demand savings?
(___ MW as reported for Pilot test by Nexant to date)
5. What equipment and/or services did you offer to participants?
6. Did you offer participants training or other instructional help during any point in their participation? Explain.
7. Describe your process for evaluating projects? This would include evaluating demand saving from pilot tests or any other type of evaluations.
8. Did you verify equipment installations and/or curtailment processes at project sites?
If yes, how? On how many participants _____?
Did you have a particular sampling plan for this?
9. What method was used to track/report project progress (to the CEC, to the M&V contractor)?

The general guidelines for the rating scale for these questions ranges between:
5=Complete/thorough; 3=Sufficient/adequate; 1=Absent/ wholly inadequate.

10. Are verifications documents available and adequate for the sampled projects?

Scale: 5=all requested documents available; 3=half of requested documents available; 1=no documents available.

11. Were invoices valid? (as shown by proper documentation and consistent with the initial agreements between parties involved and the program requirements)

Scale: 5=All invoices consistent; 3=Half of invoices are consistent; 1=Invoices completely inconsistent or not available.

12. Was the verification process as described above followed? Was it consistently applied?

Scale: 5=Thorough verification process with full documentation; 3=Observed two or more significant deviations from verification process with sound explanations; 1=No verification process or not at all according to plan.

13. Did installed equipment agree with the invoices or other verification documents ?

Scale: 5=Complete consistency between invoices and equipment; 3=Observed two or more discrepancies between invoices and equipment; 1=Invoices completely inconsistent with equipment or not available.

14. Were participants paid what they had been promised? Out of project funds?

Scale: 5=All payments made according to customer agreements; 3=Most payments made according to customer agreements, two or more discrepancies; 1=Payments not made at all, or are not made according to agreements, or all payments made are in dispute.

15. Was the tracking/reporting method noted above maintained?

Scale: 5=Actual tracking/reported method is consistent with planned method, with data available for all requested participant sites; 3=One or more deviations from planned method or half of records inadequate or missing; 1=No effective tracking method observed or data found to be completely inaccurate.

Program Participant Audits (SE.3)

1. How did you find out about the CEC Peak Load Reduction Program?

2. Why did you choose to participate in the program?

3. Did you participate in any other similar or related programs? Which? What? When or for how long?

4. How often did your program administrator communicate with you during your participation in the program? This includes from program onset through application processing and routinely throughout the your participation.

Rating Question: On scale of 1 to 5, rate communication process with administrator

5. By what means did you most often communicate?

6. What types of reporting requirements were you responsible for? How often?

Rating Question: On scale of 1 to 5, rate the reasonableness of the reporting requirements

7. How long did it take for you to be notified about your application status after you submitted it?
8. Did your program administrator visit your site to verify that the project was completed? If not, was verification done in another manner rather than a site visit? Explain.
9. Did you achieve your peak demand savings goals?
10. Did you encounter any obstacles to achieving your peak demand savings?

Rating Question: On scale of 1 to 5, rate the obstacles you encountered

11. What is the likelihood that you would have performed peak load-reducing actions without this program?

Rating Question: Rate on 1-5 scale

12. From your experience with this program would you participate again in a similar program? If not, why?

Rating Question: 5=without question; 3=yes, though under different circumstances 1=under no circumstances. (Note: recipients could be asked for a percent probability; then convert figure to 1-5 scale)

Please rank the following questions on a scale of 1 to 5; 1 being *Unacceptable* and 5 being *Outstanding*:

13. Your administrator? (Note: administrator may refer to CEC grant/contract personnel if participant is a CEC grantee)
14. The application process?
15. The invoicing, billing and payments process?
16. The verification process?
17. The implementation timeline that you were on?

Sub-Element 4: Program Participant Audits

SMUD PowerStat– Sub-element 4 Residential Pilot

1. How did you find out about the SMUD PowerStat Program? How long after you first learned of the program did you decide to become a program participant?
2. What were your reasons for participating in this program?

3. Are you participating in any other type of energy efficiency or related programs?
If YES, what are the other programs and for how long have you participated in them?
4. After you notified SMUD of your decision to participate, how long did it take SMUD to confirm your enrollment in the PowerStat program?
5. How long after your enrollment was confirmed did SMUD install PowerStat equipment in your home?
6. How often did SMUD or other program personnel communicate with you about the PowerStat program since you enrolled? By what means did you communicate with SMUD or other project personnel regarding this program? (i.e. face-to-face, telephone, e-mail, etc.)

On scale of 1 to 5*, evaluate the quality of the communication process with SMUD or other program personnel
7. Was there any type of feedback information, data or reporting that was required of you by SMUD? If YES, What feedback or reporting information was required and how frequently were you asked to provide information?

On scale of 1 to 5*, rate the reasonableness of the feedback or reporting requirements
8. After installation of the PowerStat system in your home, did SMUD or other project personnel contact you to verify that the PowerStat equipment was functioning properly?
9. Did you encounter any obstacles to operating the installed PowerStat equipment, using of the program website, or changing the way you use electricity in your home? If YES, please briefly describe the problems encountered. (if NO, please skip to question 12)

On scale of 1 to 5*, rate the obstacles you encountered.
10. Did the problems or obstacles you encountered permanently limit your ability to carry out energy saving measures or the achievement of your energy saving goals?
11. Did SMUD or other project personnel assist you with solving any problems you encountered?
12. On a scale of 1-5*, what is the likelihood that you would have changed the way that you use electricity in your home without the SMUD PowerStat program.
13. On a scale of 1-5*, rate your overall experience with the SMUD PowerStat Program on the whole.
14. On a scale of 1-5*, rate the overall quality of customer service provided by the SMUD or other project personnel that you had contact with.

15. On a scale of 1-5*, rate the quality of your overall experience with technical aspects of the PowerStat equipment and SMUD website?
16. Based on your experience with the SMUD PowerStat program, rate your likelihood of repeating this program experience or participating in a similar program on a scale of 1-5* scale? If your answer was 1 or 2, please explain why you would not be inclined to repeat the experience

* 1 being *Unacceptable* and 5 being *Outstanding*:

SMUD PowerChoice – Sub-element 4 Residential Pilot

Nexant's Participant Audit Questions to be INCLUDED in SMUD online survey:

1. (priority: medium) Are you participating in any other type of energy efficiency or related residential energy programs?
2. (priority: medium) How long after your enrollment was confirmed did SMUD install PowerChoice equipment in your home? ___ < 1 week ___ between 2-3 weeks ___ >3 weeks
3. (priority: high) Did you encounter any obstacles to operating the installed PowerChoice thermostat, or using of the program website during critical peak price events? Y/N
4. (priority: high) On scale of 1 to 5*, rate the obstacles you encountered (from above question).
5. (priority: high) Did the problems or obstacles you encountered permanently limit your ability to carry out energy saving measures and/or reduce your energy bill? Y/N
6. (priority: medium) Did SMUD or other project personnel assist you with solving any problems you encountered? Y/N

RATING QUESTIONS: (* 1 being *Unacceptable* and 5 being *Outstanding*)

7. (priority: high) On a scale of 1-5*, rate your overall experience with the SMUD PowerChoice Program on the whole.
8. (priority: high) On a scale of 1-5*, rate the overall quality of customer service provided by the SMUD or other project personnel that you had contact with.
9. (priority: high) On a scale of 1-5*, rate the quality of your overall experience with technical aspects of the PowerChoice thermostat and SMUD website?

10. (priority: high) Based on your experience with the SMUD PowerChoice program, rate your likelihood of repeating this program experience or participating in a similar program on a scale of 1-5* scale?

Energyn –Residential Pilot Program

1. How did you find out about the Energyn / Ipower Program? How long after you first learned of the program did you decide to become a program participant?
2. What were your reasons for participating in this program?
3. Are you participating in any other type of energy efficiency or related programs?
If YES, what are the other programs and for how long have you participated in them?
4. After you notified Energyn of your decision to participate, how long did it take Energyn to confirm your enrollment in the program?
5. How long after your enrollment was confirmed did Energyn install Ipower equipment in your home?
6. How often did Energyn or other program personnel communicate with you since you enrolled in the program? By what means did you communicate with Energyn or other project personnel? (i.e. face-to-face, telephone, e-mail, etc.)

On scale of 1 to 5*, evaluate the quality of the communication process with Energyn or other program personnel

7. What types of feedback information, data or reporting was required of you by Energyn? (please describe briefly) How frequently was feedback or reporting required?
On scale of 1 to 5*, rate the reasonableness of the feedback or reporting requirements
8. After installation of the Ipower system in your home, did Energyn or other project personnel contact you to verify:
 - A) that the Ipower equipment was functioning properly?
 - B) that Ipower equipment was being used to implement energy saving measures?
9. Did you encounter any obstacles to operating the installed Ipower equipment or use of the program website? If YES, please briefly describe the problems encountered.

On scale of 1 to 5*, rate the obstacles you encountered.

10. Did the problems or obstacles you encountered permanently limit your ability to carry out energy saving measures or the achievement of your energy saving goals?
11. Did Energyn or other project personnel assist you with solving any problems you encountered?
12. On a scale of 1-5*, what is the likelihood that you would have carried out similar energy saving measures without the Energyn Ipower program.
13. On a scale of 1-5*, rate your overall experience with the Energyn / Ipower Program on the whole.
14. On a scale of 1-5*, rate the overall quality of customer service provided by the Energyn or other project personnel that you had contact with.
15. On a scale of 1-5*, rate the quality of your overall experience with technical aspects of the Ipower equipment and Energyn website?
16. Based on your experience with the Energyn / Ipower program, rate your likelihood of repeating this program experience or participating in a similar program on a scale of 1-5* scale? If your answer was 1 or 2, please explain why you would not be inclined to repeat the experience

* 1 being *Unacceptable* and 5 being *Outstanding*: