

Technical Proposal Submittal
to

Pennsylvania Public Utility Commission
Bureau of Conservation, Economics, and Energy Planning

In response to

Request for Proposals

RFP-2009-1

Act 129 Statewide Evaluator

June 16, 2009 (Revised)

Prepared and Submitted by:



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June 16, 2009

Mr. Wayne Williams
Director
Bureau of Conservation, Economics, and Energy Planning
Pennsylvania Public Utility Commission
2nd Floor West, Commonwealth Keystone Building
400 North Street
Harrisburg, Pennsylvania 17120

RE: Revised GDS Proposal in Response to RFP-2009-1 for Act 129 Statewide Evaluator

Dear Mr. Williams:

GDS Associates, Inc. is pleased to submit the enclosed revised technical proposal to the Pennsylvania Public Utility Commission in response to RFP-2009-1 relating to the Act 129 Statewide Evaluator. The only revisions that GDS made to the original technical proposal of May 27th, 2009 relate to adjusting the forecast of labor hours by consultant to match our revised cost proposal submitted today. These revised labors for Phase I, II, and III are provides in tables 3, 7, 8, 9, 10 and 13 of our revised technical proposal. Because GDS did not update any of the proposal Appendices, I have not provided these appendices again.

GDS has assembled a nationally-known and recognized team of evaluation experts to perform the required scope of work. We would welcome the opportunity to present our proposal to the Commission at a time convenient for you.

Our proposal remains valid for 180 days from May 27, 2009. The GDS Associates Team also exceeds all of the minimum qualifications listed in section I-33 of the Commission's RFP.

Please contact me if you have any questions about our proposal.

Sincerely,

Richard F. Spellman
President

Table of Contents

1.0	<i>Understanding of the Problem</i>	1
2.0	<i>Management Summary</i>	7
3.0	<i>Work Plan</i>	9
3.1	Phase I – Develop Audit Plan	9
3.2	Phase II – Annual Reviews	14
3.3	Phase III – 2013 Review	37
4.0	<i>Experience and Capabilities</i>	45
4.1	Overview of Evaluation Experience and Capabilities of GDS Associates, Inc.	48
4.2	Overview of Experience and Capabilities of Nexant	62
4.3	Overview of Experience and Capabilities of Clark Energy, Inc.	65
4.4	Overview of Experience and Capabilities of Mondre Energy	67
5.0	<i>Qualifications of Key Personnel</i>	77
5.1	Bios of Key Personnel	77
5.2	Roles of Key Personnel	85
6.0	<i>Statement of Potential Conflicts of Interest</i>	87

Appendix A – Resumes of Key Personnel

Appendix B – GDS Team List of Related Projects

Appendix C – Noncollusion Affidavit

Appendix D – BPA Non Wires Solutions Program Process Evaluation Report

Appendix E – The New Hampshire Electric Utilities’ Low-income Retrofit Program – Impact Evaluation

Appendix F – Example Screen Shots of Web Based Data Tracking and Reporting System

1.0 Understanding of the Problem

This section contains detailed information about our understanding of the problem and the strategies and methods the GDS Associates Team will use to evaluate the impacts of the Energy Efficiency and Conservation (EE&C) Programs of the large Pennsylvania Electric Distribution Companies (EDC). The EDCs are: Duquesne Light Company, Metropolitan Edison Company, PECO Energy Company, Pennsylvania Electric Company, Pennsylvania Power Company, PPL Electric Utilities Corporation, and West Penn Power Company. Act 129 of 2008 requires the Commission to establish an evaluation process that monitors and verifies data collection, quality assurance and the results of each EDC plan and the program as a whole, in accordance with the Total Resource Cost Test ("TRC"). Before discussing specific activities that we have planned for each of the tasks specified in the RFP, we will describe the theoretical and practical framework in which we will conduct the evaluations, and our understanding of the problem.

The Commission issued RFP-2009-1 to retain the services of a statewide Contractor who will monitor and verify EDC data collection, quality assurance processes and performance measures, by customer class. This Contractor will also evaluate each EDC plan results on an annual basis and the entire energy efficiency and conservation program as a whole in 2013. This evaluation will include an analysis of plan and program impacts (demand and energy savings) and cost-effectiveness, report results and provide recommendations for plan and program improvements. The statewide Contractor will produce an accurate assessment of the future potential for energy savings through market potential assessments. We understand that these programs are being implemented pursuant to Act 129 of 2008 (Act 129) and that the evaluations shall be conducted within the context of the Implementation Order and Act 129.¹ As such we seek to serve as the Statewide Evaluator to evaluate the individual EDC EE&C programs annually and the program as a whole in 2013.

The scope of work approach proposed by the GDS Team meets or exceeds all of the requirements for tasks and deliverables that are listed in the Commission's RFP. Based on the Pre-bid meeting, it is the GDS Team's understanding that formal and comprehensive impact evaluations that would duplicate the sampling and data collection done by the EDC's are not anticipated. Our scope of work approach was developed to provide the required level of verification described in the RFP and at the Pre-bid meeting, and our approach will "spot check" the work done by the utility evaluators.

This evaluation will include an analysis of each plan from both a process and impact standpoint, program impacts (demand and energy savings), and cost-effectiveness according to the Total Resource Cost Test (TRC). The GDS team will provide quarterly process updates as well as biannual improvement workshops with the EDCs. The annual reports produced will provide the Commission with recommendations for EE&C plan and program improvements. Additionally,

¹ The Commission has been charged by the Pennsylvania General Assembly pursuant to Act 129 of 2008 ("Act 129") with establishing an energy efficiency and conservation program. 66 Pa.C.S. §§ 2806.1 and 2806.2. The energy efficiency and conservation program requires each EDC with at least 100,000 customers to adopt a plan to reduce energy demand and consumption within its service territory. 66 Pa.C.S. § 2806.1. In order to fulfill this obligation, on January 16, 2009, the Commission entered an Implementation Order at Docket No. M-2008-2069887. As part of the Implementation Order and Act 129, the Commission seeks a Statewide Evaluator to evaluate the EDCs' energy efficiency and conservation programs.

the GDS team will provide a public web accessible database and reporting system for the Commission's website so that the general public may be kept abreast of the impacts of the EE&C by program and sector. As the statewide Contractor we will also produce in 2013 an accurate assessment of the future potential for energy savings through a market assessment study. While all of these tasks are related, they each have distinct goals:

- Impact evaluation reviews seek to *quantify* the energy, demand, and possible non-energy impacts that have resulted from demand-side management (DSM) program operations;
- Process evaluations seek to *describe* how well those programs operate and to *characterize* their efficiency and effectiveness; and
- Market Characterization and Assessment seeks to *determine* the attitude and awareness of market actors, measure market indicators and identify barriers to market penetration.

The GDS team is well experienced with each of these evaluation types and with cost-effectiveness testing, and will follow standard professional practices as documented in the literature and practices outlined in the Technical Reference Manual (TRM) adopted by the Commission to help fulfill the evaluation process requirements, when conducting our reviews of the EDCs' EE&C programs.

Impact Evaluation Overview

The Impact Evaluation task will be conducted by the GDS team in PHASE II of the contract based upon the plans developed in PHASE I. We will assign individual program-types (i.e., residential programs, low-income residential programs, small commercial programs, large commercial/industrial programs, governmental and educational entities programs, etc.) to team leads to better utilize our strengths and qualifications. The team leads will design and plan all evaluation activities for the EDCs specific to the team's assigned program-type. Additionally, the team leads will develop their individual audit plans to be incorporating in the Audit Plan produced at the end of PHASE I. As stated in the contract and pursuant to the Implementation Order and Act 129, the impact evaluations and audits will be conducted annually for each EDC program. The GDS Team is willing to conduct the impact evaluations every two years should this be acceptable (and more practical) to the commission.

Fundamentally, impact evaluations seek to quantify the *net* savings that have been realized by the programs under review by determining the *gross* savings realized by projects enrolled in the programs, and *net-to-gross* ratios. *Gross* savings are the change in energy and demand requirements for program participants as reported by program administrators, while *net* savings are the changes in energy use that occur outside of the program (*spillover*) or that would have occurred naturally without the program's influence (*free ridership*.)

The basic overarching relationships in the impact evaluation are presented below:

$$\text{Net Savings} = (\text{Gross Savings}) \cdot (\text{Realization Rate}) \cdot (\text{Net / Gross}) \quad \text{Equation 1}$$

Where:

$$\text{Net / Gross} = 1 - P_{\text{Freeridership}} + P_{\text{Spillover}} \quad \text{Equation 2}$$

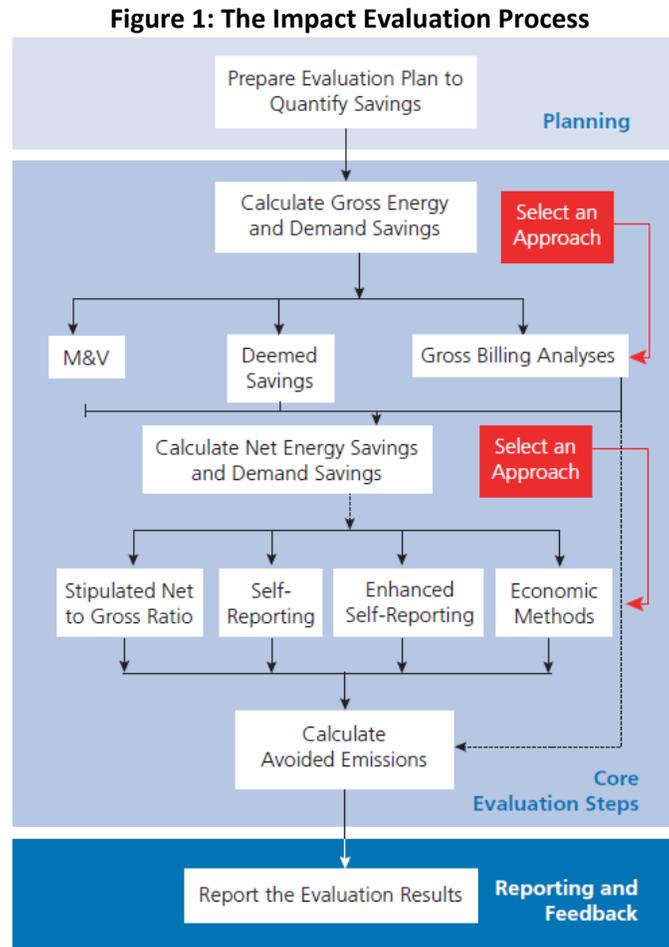
$$\text{Realization Rate} = \text{Savings}_{\text{Evaluator-determined}} / \text{Savings}_{\text{Program reported savings}} \quad \text{Equation 3}$$

$$\text{Gross Savings} = \text{Program reported savings}$$

$$P_{\text{Free ridership}} = \text{Percent free ridership}$$

$$P_{\text{Spillover}} = \text{Percent Spillover}$$

Figure 1 summarizes the general approach to the impact evaluation process.



The GDS team will follow the TRM deemed savings framework and the fundamental calculations shown above in conducting the impact evaluation of the EDC programs. Techniques that we will use to accurately calculate the program impacts will include the following:

- Measurement and verification using engineering methods;
- Site inspections and data collection (accurate metering of end use systems – *install a meter on anything that results in energy savings if project has a significant impact without reinventing the wheel*);
- Computer simulations;
- Billing analysis; and
- Interview program participants and non-participants.

The cost-effectiveness analysis will use the net savings determined through the impact evaluation, program and participant costs recorded by the program administrators enhanced with published cost data from sources such as RS Means, and measure life data obtained from previous studies, ASHRAE or public data sources such as the Northwest Power and Conservation Council's Regional Technical Forum database, California's Deemed Energy Efficiency Resource database, NYSERDA Deemed Savings Database and avoided-cost data furnished by each respective EDC. The associated costs will include administrative, marketing and outreach and other implementation costs. The benefit-cost results will be calculated in accordance with the Total Resource Cost Test (TRC) formulas.

The primary determinants of impact evaluation costs are the sample size and the reliability of metered energy use data, while the accuracy of the study findings is in turn dependent on these parameters. We recommend that the impact evaluation results be reported with 10 percent precision at the 90 percent confidence level.

Thus, the results of the annual impact evaluations will

- Identify the cost-effectiveness of each plan,
- Ensure that the claimed measures are being properly installed and utilized, and
- Ensure that the installed measures are obtaining the claimed energy savings or reductions.

GDS will use the GDS benefit/cost model to calculate TRC benefit/cost ratios. This model was developed by GDS and it has been accepted by many state regulatory commissions in the US.

Process Evaluation Overview

The process evaluation uses interview and survey techniques to describe program operations, which can be compared to original design intent; and to measure participant satisfaction and program performance, which can be analyzed to identify gaps between program goals and results. The outcome of this analysis will provide conclusions and recommendations for enhanced program performance. The results of the process evaluations will help:

- To highlight areas for improvement and
- To identify best practices that may be implemented on a going-forward basis.

The net savings analysis will be tied to the process evaluation and all personnel will work closely for efficient integration of these activities. For example the data collected through site inspections will inform the process evaluation which will be conducted on a subset of the participant sample to minimize sample sizes and control the evaluation budget. The GDS Team has extensive experience conducting data collection, data analysis and report writing for process evaluations. Our consultants are experienced with conducting in-depth interviews to collect information for process interviews.

Market Assessment Overview

Fundamentally, the market assessment evaluation activity area is envisioned to contain two components:

- Market Characterization – under this component, aspects of the targeted market in the applicable EDC service territories will be documented, including pertinent background and baseline program information, such as numbers and types of participants and

eligible market data, as well as market actor information, by specified regions of the territory where applicable.

- Market Assessment – under this component, the GDS team will identify and track changes in the market by examining key indicators that signal movement in the market and that track program progress toward achievement of key goals.

The key objectives of the Market Characterization and Assessment (MCA) include:

- Determining attitudes and awareness of market actors;
- Measuring market indicators;
- Identifying market barriers, and options to reduce and/or eliminate them;
- Conducting baseline studies, where needed, and
- Updating baselines for energy efficient products, if necessary.

To achieve these objectives, the GDS team will: (1) develop and update the descriptions of existing and emerging program markets (e.g., sub-markets, the impact of economic influences and role of market actors); (2) identify market trends, as compared to program participation rates; and (3) develop baselines and track changes in program penetration, perception and value, and identify shifts in the primary and sub-markets that would signal market transformation progress over time, with a focus on pertinent market indicators that are likely to increase understanding of program performance. Where appropriate, we will build upon prior evaluation efforts conducted by the EDCs.

In addition to the detailed methodologies described further in this proposal, the following steps will be taken to develop this evaluation:

- Meet with the Commission evaluation and program staff to identify and prioritize potential MCA evaluation activities.
- Review secondary data sources, including reports previously prepared for the Commission and for other organizations and assess the sources' value for supplementing current evaluation activities.
- Review and use information from existing program logic models (where available – or develop such models where needed) to develop evaluation design matrices and data collection efforts that are based on prioritized program and market progress indicators and that will allow for consistent tracking of data over time.
- Coordinate with the Commission and with each EDC and other members of the evaluation team to maximize the efficiency of data collection, research, and reporting efforts, including sharing market data to estimate market effects attributable to EE&C programs presence in the market.

Results of the MCA will provide the Commission with insights and information to assist in decision-making regarding current and evolving program design and implementation strategies and future demand and energy savings targets. All activities will be conducted to allow for comparison and retention of time-series data from prior EDC evaluations wherever possible.

This evaluation effort will also identify new areas of inquiry and will probe deeply into specific assessment areas to provide important insight on key program-related areas.

The GDS Team has extensive experience completing market characterizations, market assessments and energy efficiency potential studies. Detailed descriptions of similar MCA projects we have completed are provided in Appendix B of our proposal.

EDC EE&C Programs Evaluation and Audits

The GDS team understands that the RFP is seeking an evaluation of each EDC plan, by customer class, program, and portfolio of programs. The GDS team will audit and assess each plan in order to:

- Identify the cost-effectiveness of each plan in accordance with the Commission adopted Total Resource Cost Test Manual.
- Provide reasonable assurance that the claimed measures are being properly installed and utilized.
- Provide reasonable assurance that the installed measures are obtaining the claimed energy savings or reductions in accordance with the Commission adopted Technical Reference Manual or metered savings.
- Identify areas for improvement.
- Identify best practices that may be implemented on a going-forward basis.

We have structured our technical evaluation approach, evaluation sequence and schedule and costing based on the program metrics required to determine cost-effective energy and demand savings by customer class. The GDS team, using the techniques described in this section, will be able to coordinate and consult each EDC in their efforts to measure and collect the necessary data needed to quantify the connected, seasonal and peak/off-peak demand, and energy savings so that we may effectively analyze program impacts with reasonable auditing efforts. We understand that this will be an on-going M&V audit and evaluation project and we have extensive experience in making on-going evaluations cost-effective and technically sound. A good example is our team's current contract with NYSERDA for a multi-year cross cutting evaluation of the Con Edison-NYSERDA System Wide Demand Reduction program.

We will prepare detailed reports that present the audit results and final evaluations in a way that is useful to the Commission, the program administrators and the public to fully document the impacts these programs have had on the energy landscape and market in Pennsylvania. Our reports will document our assumptions, list subjects for follow-up research, and make recommendations for improving the accuracy of program results and for modifying program operations to better align them with goals. Section 3 of our detailed proposal describes our technical approach to the key research issues outlined in the RFP.

2.0 Management Summary

The GDS Team is comprised of project managers, associates, engineers and analysts well versed in running DSM programs and evaluating their current impacts and future potentials. As such, the GDS Team brings years of collective experience, knowledge, and the tools required to accurately and effectively evaluate existing programs and to determine the future of such programs based on current and best practices.

The GDS Team has conducted many program evaluations and therefore is well equipped to develop an evaluation and audit plan, as tasked in Phase I, that will be easy to implement and will standardize the measurement and verification practices of the EDCs so that the data collected will lead to accurate and realizable determinants of impact including demand and energy savings, participation numbers, and program costs. As part of the audit plan, the GDS Team will include workshops and spot-check criteria to ensure that the EDCs are properly implementing the M&V protocols so that their annual reports are not only accurate but are also standardized in terms of metrics and evaluations.

For Phase II of the project, the GDS Team will conduct annual reviews and spot checking of the individual EDC's annual reports submitted to the Commission summarizing the impacts of their current EE&C programs for the year. As part of these annual reviews, the GDS Team will verify that the M&V practices are being implemented according to the protocol standardized in the audit plan. As part of this process, the GDS Team will perform spot-checks to verify some of the in-field savings measurements, will inspect some of the equipment used by the EDCs' to take energy measurements, and will review the utility bills, program budgets, and participation numbers. Using these verification practices with those outlined in the audit plan, the GDS Team will review the EDC's annual reports to verify the energy and demand savings, the cost-effectiveness of the programs, and the effectiveness of the current implementation strategies. The GDS Team will include in this review a list of recommendations for the future of the programs based upon best practices and the current finding of each annual review.

As part of the final phase of the overall project, the GDS Team will conduct a full market assessment and potential study in order to determine the future potential for EE&C efforts within the service territory. This study, due in year 2013, will include a review of the overall program performance and progress of the collective EDC EE&C efforts to date along with the current market saturations of energy efficient equipment and practices. Using this information, the GDS Team will be able to determine the technical potential with the region in addition to the expected achievable potential of future EE&C programs.

Based on the narrative description of efforts above, the following table contains of list of services and deliverables to be provided by the GDS Team during each phase of the project. A more detailed and technical description of each can be found in Section 3.0 of this proposal.

Table 1

Phase & Task:		Service/Deliverable
Phase I: Develop an Audit Plan		
1.	Kick-off Meeting	Service
1a.	Agenda	Deliverable
1b.	Meeting Minutes	Deliverable
2.	Develop measurement and verification protocols, evaluation	Service

	metrics and reporting guidelines for EDCs.	
2a.	Measurement and verification protocols	Deliverable
3.	Develop audit evaluation plan, including cost-effectiveness plan, verification approach, and schedules.	Service
3a.	Audit evaluation plan	Deliverable
4.	Develop data gathering, sampling and analysis methods.	Service
4a.	Sampling and analysis method protocols	Deliverable
5.	Review and evaluate EDC evaluation plans, including scope of work for plan evaluation studies.	Service
5a.	Written comments on the EDC evaluation plans	Service
6.	Develop web accessible database and reporting system	Service
6a.	Provide web accessible database and reporting system for the Commission's website.	Deliverable
7.	Develop the Audit Plan	Service
7a.	Provide final Audit Plan	Deliverable
Phase II: Annual Reviews		
8.	M&V Audits	Service
9.	Process Surveys	Service
10.	Review and evaluate EDC Annual Reports - Impact.	Service
11.	Review and evaluate EDC Annual Reports – Cost-effectiveness	Service
12.	Evaluate process survey results	Service
13.	Quarterly Reports to the Commission	Deliverable
14.	Semiannual Workshops	Service
14a.	Agenda & Workshop Materials	Deliverable
14b.	Workshop Minutes	Deliverable
15.	Annual evaluation reports	Deliverable
Phase III: 2013 Review		
16.	Market Assessment	Service
16a.	Develop Market Surveys	Service
16b.	Conduct Market Surveys	Service
17.	Analyze Energy and Load Reduction Achieved by EDC EE&C Programs through May 2013	Service
18.	Analyze Overall Costs Incurred to Obtain Energy and Load Reductions by EDC EE&C Programs through May 2013	Service
19.	Analyze the Cost-Effectiveness of the EE&C Program as a	Service
20.	Identify Best Practices	Service
21.	Suggests Improvements for Program as a Whole	Service
22.	Assess the Future Energy and Load Reduction Potential	Service
23.	Market Potential Report for Director of CEEP	Deliverable
24.	Five-Year EE&C Program Report for the Commission	Deliverable

The GDS Team understands that the Commission may require further services based upon the evaluations, reviews and recommendations resulting from this project. The GDS Team includes several members with experience developing exhibits and delivering expert testimony regarding all aspects of EE&C programs from development to implementation to evaluations.

3.0 Work Plan

This section of the GDS Team proposal describes the approach we will use to audit and assess each EDC evaluation plan to accomplish the following:

- Identify the cost-effectiveness of each plan in accordance with the Commission adopted Total Resource Cost Test Manual.
- Provide reasonable assurance that the claimed measures are being properly installed and utilized.
- Provide reasonable assurance that the installed measures are obtaining the claimed energy savings or reductions in accordance with the Commission adopted Technical Reference Manual or metered savings.
- Identify areas for improvement.
- Identify best practices that may be implemented on a going-forward basis.

The scope of work approach proposed by the GDS Team meets or exceeds all of the requirements for tasks and deliverables that are listed in the Commission's RFP. Based on the Pre-bid meeting, it is the GDS Team's understanding that formal and comprehensive impact evaluations that would duplicate the sampling and data collection done by the EDC's are not anticipated. Our scope of work approach was developed to provide the required level of verification described in the RFP and at the Pre-bid meeting, and our approach will "spot check" the work done by the utility evaluators.

GDS understands that it will be responsible for managing all sub-contractors so that the GDS Team speaks with one voice through the prime Contractor (GDS). GDS will also be responsible for maintaining regular and direct communication with the Commission's Bureau of Conservation, Economics and Energy Planning ("CEEP"). GDS will also maintain and archive electronic and paper files and data collected or developed during the conduct of the team's duties. GDS will attend meetings as directed by CEEP.

3.1 Phase I – Develop Audit Plan

The first phase on this contract consists of the development of an Audit Plan describing the measurement and verification protocol, metrics, and data formats each electric distribution company (EDC) must use and provide to the GDS team to support their claimed energy savings and load reductions per program and per customer class. Planning is a critical precursor to the successful implementation of any evaluation study; therefore the GDS team will devote significant effort to developing an overall evaluation plan and architecture for the evaluation review and reporting activities requested in the RFP. It is our experience that by involving experienced, senior staff at the planning and initial investigation stages, that we can most effectively use lower cost junior staff to carry out the data collection and analysis tasks that make up the bulk of the investigation workload. Thus, good planning is also an effective cost control tool. The GDS Team will identify what data is required, how the data is to be measured, recorded and transmitted, and how the data will be audited and analyzed. This Audit Plan will be delivered within 90 days after contract execution and it will address all of the items listed on pages 31 and 32 of the Commission's RFP.

The GDS team will organize and attend a project initiation ("kick-off") meeting at the Commission's offices with the appropriate Commission staff, representatives from CEEP and with representatives from each EDC. The purpose of this kick-off meeting is to review the specifications of the annual process and impact evaluation requirements, provide the

Commission with the opportunity to clarify tasks and goals, and to begin assembling the data records and tracking tools that are needed to start planning the review. A specific goal of the meeting is to identify the reporting requirements for the study, and to then work backwards to identify the independent variables such as realization rates and net-to-gross (NTG) ratios that must be determined to meet the requirements of a meaningful evaluation study. We will then disaggregate each independent variable into its underlying components, leading to a list of data points that will be determined through the research activities conducted in the field and through survey methods. GDS has found that this top-down approach protects against overlooking key data collection needs.

Because of the need for cost-effective yet reliable evaluation methods, coupled with the expectations for regulatory scrutiny, the data collection and sampling plans to be recommended for the EDCs will be guided by value of information (VOI) algorithms to supplement the deterministic sample sizing that follow from more routine statistical sampling methods. VOI algorithms adjust sample sizes according to the cost of changes to sample sizes, compared to the changes in value – in this case, a quantifiable change to the range of uncertainty of program net benefits – which the expected increase in precision is expected to produce. The GDS team will pay particular attention to the inputs for the Total Resource Cost (TRC) cost-effectiveness tests that will be calculated. Much of the data for these benefit/cost analyses must be collected as part of the field work and survey steps. The GDS team will prepare minutes of the kickoff meeting within five business days of the meeting date.

After developing an overall evaluation plan for the EDC programs we will focus our attention on developing sector and program specific plans for the energy efficiency and conservation (EE&C) programs. At this stage we will need access to EDC program specific documents including database records and filing reports. We will conduct a detailed study of program logic models and develop evaluation metrics for each program and sector. This is where we will define program and portfolio level sampling criteria and stratification thresholds for each EDC EE&C program to ensure a representative review of the project population. The primary focus will be the projects and measures with the greatest impact and greatest variance. Review of past program evaluations conducted in Pennsylvania and in the region will inform the development of program specific evaluation plans and will help identify the gaps in data collection.

In summary, this portion of the Audit Plan will provide each EDC with the following guidelines and requirements of their individual evaluation plan:

- Type and format of data to be provided by EDC's tracking system to measure and verify energy savings and load reductions.
- Required reporting formats.
- Statewide data management and quality control guidelines.
- Design, implementation and maintenance of statewide database of program portfolio, EDC and statewide energy and demand savings and cost-effectiveness reporting guidelines and requirements.
- Type and format of data used to evaluate the cost-effectiveness of expenditures.
- Any other information that the GDS team identifies as necessary to determine the effectiveness of each plan and the program as whole.
- Description of metrics to be used, including energy and demand savings metrics) for each program and the portfolio as a whole.

GDS expects that the actual individual EDC program evaluation plans will likely be continuously revised and cyclically updated at the beginning of each annual review; therefore, we understand that this task of reviewing and approving EDC evaluation plans will be ongoing.

In addition to the Audit Plan identifying what data is required, how the data is to be measured, recorded and transmitted, the plan will include a description of how the data will be audited and analyzed by the GDS team. The audit portion of the plan will include steps and measures to ensure that the GDS team will be able to provide the Commission with a meaningful and confident assessment of each program's progress to date in terms of both process and impact assessments. The audit will include the following types of techniques (as described in the Commission's RFP) to ensure a significant level of confidence in the evaluations submitted to the Commission:

- On-site visits to a small sample of program participants to verify the installation and proper functioning of energy efficiency measures.
- On-site visits to a small sample of program participants to inspect and verify the installation and proper functioning of meters used to collect equipment consumption data.
- Desk audits of utility inspection records.
- Audits of a random sample of records in the utility data tracking and reporting systems to assess whether energy efficiency project data entered into the EDC database is accurate and reliable.

Specifically the audit portion of the plan will address the following:

- Audit objectives including the verification of EDC evaluation plans, M&V practices, program expenditures, and reported savings (demand and energy).
- The EE&C measures to be audited, based on savings and market penetration potential, and the plan measure logic/theory by which they will be audited.
- Methodologies, procedures, and data tracking system to be used by the GDS team to verify the impact evaluations and project verification for each plan.
- Data gathering techniques to be employed by the GDS team.
- Sampling and analysis methods utilized by the GDS team to conduct an effective audit.
- Verification and due diligence procedures for site inspections.
- Data and information needed from EDCs and other sources. The GDS Team will develop a detailed data request for the information that will be requested from each EDC.

The GDS team will have the Audit Plan delivered to the Commission within 90 days after the contract execution. The GDS team understands that, according to the WORK STATEMENT in the RFP, it will be responsible for the following in PHASE I:

- The development of an Audit Plan supporting verification of the EDC plans and reports;
- The specifications of EDC reporting requirements;
- The review of each EDC Plan, which includes the EDC's evaluation, measurement and verification (EM&V) review processes;
- A plan for evaluation activities, including coordination of EDC evaluation; and
- Providing and maintaining a public web site accessible database and reporting system for the Commission's web site.

The GDS team will also develop, in consultation with the Commission and EDCs, the EDCs' data reporting requirements, as well as quarterly and annual reports to be submitted to the Commission. As noted above, the GDS team will develop a web-based database and reporting system (for the Commission's web site) so that Commission staff and other interested stakeholders will be able to access documents and databases relating to the Commission's auditing process.

GDS will provide and maintain a web-accessible data tracking and reporting system with a public interface. The database system is designed to import, store, and report on program data such as energy savings, participation and financial incentives paid. For example screen shots of the web based reporting system see Appendix F.

GDS is currently using this system to implement programs for GDS clients. This system has been in use for the Efficiency Maine Business programs for the past five years and was recently customized for Ameren Illinois' efficiency programs. GDS has extensive experience managing the incentive tracking systems that report program activities, data and financials. GDS has also had substantial involvement in the design of data tracking systems for energy efficiency programs in Wisconsin, Massachusetts and other states. GDS also completes all of the data entry and data processing relating to incentive payments for the Focus on Energy Production Agriculture and Rural Business Programs in Wisconsin, and the Business Program for Efficiency Maine.

GDS' web-based data-tracking system offers flexibility and capacity for growth. The database can track information on energy efficiency measures implemented, incentives paid, energy and demand savings, and other data to determine program cost-effectiveness. The database can also track interactions with existing and potential program participants. The data tracking and reporting system has been developed with a user-friendly system and interface. Based on user feedback, the prototype application has been modified and expanded over the past few years to reflect suggested improvements and to meet new requirements of the users.

The progress of each EDC program will be ***continuously monitored through regular reporting*** and semi-annual reviews with the Pennsylvania Public Utility Commission and other stakeholders. In the design stage, each program will be specifically defined for a launch strategy, key focus markets and allies, marketing actions and outreach activities, and savings and incentive goals. Each of these elements will be scheduled and tracked to gauge individual and overall portfolio progress. On a monthly basis, the program performance will be assessed and tested against the plan, using data from the Data Tracking System.

Ability to Track Data, Ensure Security and Transfer Data

The program tracking database and website will be hosted either at GDS headquarters or at a dedicated hosting company. Security will be ensured by restricting access to authorized users with a valid username and password and by encrypting data on the website. Additional best practice security measures such as network firewalls will further prevent unauthorized access. The entire system will have full backup and restore capabilities.

For the Maine Business Program, GDS and its program partner have worked hand-in-hand to develop a seamless data transfer protocol for GDS to obtain and upload relevant financial data to their tracking and reporting system.

Security and Reporting Approach for Tracking System

Web-based access to program tracking and reporting is available to all authorized users via a web browser such as Internet Explorer and a unique username and password. Additionally, data sent to and from the website will be encrypted using Secure Sockets Layer (SSL) or other similar encryption protocol. Real-time reporting capabilities for the PUC website or the public user interface will be provided through custom asp.net web pages or Microsoft SQL Server Reporting Services.

Data Exporting Capabilities

The GDS data tracking and reporting system uses Microsoft ASP.NET, SQL Server 2005 and SQL Server Reporting Services. This system is flexible enough that it is able to translate and export data which can then be imported into systems based on different database technologies such as Oracle, MySQL, etc. Because of this flexibility in exporting data, we do not anticipate the need to change the base technology format of our data tracking system. We have the flexibility to change to database structure depending on the request of the Pennsylvania PUC and what database specifications are specified. Because the GDS data tracking and reporting system is based on standard Microsoft technology, it supports all common data exchange formats including XML, .CSV, .TXT, .MDF, .XLS, etc. In current implementations of the data tracking system, we export data regularly using a text-delimited file.

The GDS team understands that additional formal and informal reporting requirements may be required upon request of the Director of CEEP and that the Audit Plan will not be considered final until approved by the Director of CEEP. The Audit Plan will be considered a “living document,” that can be revised on a regular basis throughout the project term. The GDS team is aware that, with approval of the Director of CEEP, the Audit Plan can be updated as needed to adjust to changes in EDC plans. GDS understand that any updates must occur at such times that will allow EDCs ample opportunity to adjust their data collection and recording methods and meet their annual reporting requirements.

Table 2: Phase I – Tasks, Deliverable and Dates:

Task:	Deliverables:	Dates:
1. Kick-off Meeting	<ul style="list-style-type: none"> • Agenda • Minutes 	Within 90-days of contract execution.
2. Develop measurement and verification protocols, evaluation metrics and reporting guidelines for EDCs.	<ul style="list-style-type: none"> • Measurement and verification protocols 	Within 90-days of contract execution.
3. Develop audit evaluation plan, including cost-effectiveness plan, verification approach, and schedules.	<ul style="list-style-type: none"> • Audit evaluation plan 	Within 90-days of contract execution.
4. Develop data gathering, sampling and analysis methods.	<ul style="list-style-type: none"> • Sampling and analysis methods 	Within 90-days of contract execution.
5. Review and evaluate EDC evaluation plans, including scope of work for plan evaluation studies.	<ul style="list-style-type: none"> • Written comments on the EDC evaluation plans 	Within 90-days of contract execution.
6. Develop web accessible	<ul style="list-style-type: none"> • Provide web accessible 	Within 90-days of

database and reporting system.	database and reporting system for the Commission's website.	contract execution.
7. Develop the Audit Plan	• Provide final Audit Plan	Within 90-days of contract execution.

The team assigned to this task will include the consultants listed in the table below. Richard Spellman, the President of GDS, will manage all aspects of Phase I. The anticipated time required by each team member for the tasks associated with PHASE I are outlined in the Table 3 below.

Table 3 – Time Estimates for Phase I

Time Estimates for GDS Consultants by Task - Phase 1 (2009) - Revised June 16, 2009														
TASK#	TASK DESCRIPTION EXAMPLES	President	Vice President	Principal	Managing Director	Senior Project Manager	Project Manager	Project Engineer/Project Consultant	Senior Engineer/Analyst	Associate Engineer/Analyst	Senior Engineering Assistant	Executive Assistant	Engineering Assistant	Total Labor Hours By Task
1	Organize and Participate in Project Initiation Meeting at Commissions Offices	7	8	8	8	23	34	41	49	16	24	24	29	271
2	Develop measurement and verification protocols, evaluation metrics and reporting guidelines for EDCs.	8	9	9	9	26	56	69	81	27	41	41	49	426
3	Develop audit evaluation plan, including cost-effectiveness plan, verification approach, and schedules.	8	9	9	9	26	56	69	81	27	41	41	49	426
4	Develop data gathering, sampling and analysis methods.	8	9	9	9	26	56	69	81	27	41	41	49	426
5	Review and evaluate EDC evaluation plans, including scope of work for plan evaluation studies.	14	15	16	16	45	96	118	140	47	70	70	84	730
6	Develop web accessible database and reporting system.	3	4	4	4	11	38	47	56	19	28	28	33	276
7	Develop the Audit Plan	20	23	24	24	68	144	177	209	70	105	105	126	1095
Total Consultant Hours:		68	77	81	81	226	480	590	698	233	349	349	419	3649

3.2 Phase II – Annual Reviews

As part of the annual review process in PHASE II the GDS team will monitor and verify data collection, quality assurance and the results of each EDC plan in accordance with the approved Audit Plan developed in PHASE I. In addition to the annual audits and evaluation of impacts, GDS will assess the implementation practices and process impacts. Based on these two types of assessments, impact and process, GDS will provide best practices, areas for improvements and/or plan modification, and verification of demand and energy savings to date.

PHASE II is comprised of several general task categories. Below is a discussion of each task and GDS's proposal.

Task 1: Impact Assessment

The impact assessment task consists of two primary components – the audit and the assessment. The GDS team will monitor and verify data collection, quality assurance and the results of each EDC plan on an annual basis in accordance with the approved Audit Plan developed in Phase I. The GDS team will review each EDC's data tracking and reporting system to assess the ability and reliability of each tracking system to meet the statutory targets in a cost-effective manner.

The Audit:

The activities identified in the Audit Plan, and related to monitoring and verifying data collection, quality assurance and results of each EDC plan will include, but are not limited, to the following:

- Maintaining an evaluation and management database.
- Conducting random spot verification of EDC EM&V measurements and data.
- Ability to conduct primary data collection to support random spot verifications.
- Acquiring data from EDCs and other sources and verifying EDC supplied data.
- Conducting limited spot field inspections, in coordination with EDCs and Commission Staff, using trained personnel.
- Spot verification, in coordination with EDCs and Commission Staff, utilizing short-term and long-term metering equipment on participating customer property.
- Auditing EDC survey instruments.
- Conducting limited market baseline studies to establish energy efficiency baselines as needed for the impact evaluations of specific programs.
- Collecting and analyzing verification data.

The GDS team will conduct a limited number of on-site audits in order to ensure that the EDCs have implemented the M&V protocol as outlined in the approved Audit Plan. The audit will focus on customers, measures, projects and programs that exhibit the greatest demand and energy savings impacts.

The Impact Assessment

This section of the proposal describes the GDS team approach to conducting the verification analyses of the impact evaluations conducted by the EDCs. Per the RFP requirements, we will monitor and verify data collection, quality assurance and the results of each EDC plan on an annual basis in accordance with the approved Audit Plan developed in Phase I. Results from our verification processes will be aggregated and reported at the program, program sector (residential, low-income, commercial/industrial, and governmental, educational and non-profit entities) and portfolio level. GDS will conduct the verification of the impact evaluation for each program on a yearly basis, providing quarterly update reports to the Commission. The GDS team will utilize the reported energy and demand impacts provided by each EDC and drawn from the pre-determined annual sample size, according to the Audit Plan, within each program for the defined evaluation cycle. Impact evaluation results will be aggregated and reported at the end of each review period by the GDS team with a draft report for comment due to the Commission on August 15 of each year. A final annual report on each EDC plan will be submitted by GDS to the Director of CEEP by October 15 of each evaluation year.

The GDS team will follow standard practices and protocols for verification and will divide the impact verification into two research areas to determine gross and net impacts. Gross impacts are the energy and demand savings that are found at a customer site as the direct result of a program's operation, while net impacts are the result of customer and market behavior that can add to or subtract from a program's direct results.

Gross impacts are determined through a combination of engineering analysis and site inspections for a random sample of program participants. The program reported savings for the sample is adjusted to reflect the review findings, and this adjustment is captured in a realization rate, the ratio of evaluation review savings to program-reported savings for the sample. Total program savings are adjusted using the following equation.

Equation 4

$$kWh_{adj} = kWh_{rep} \cdot RealizationRate$$

Where:

kWh_{adj} = kWh adjusted by the impact team for the program, the gross impact

kWh_{rep} = kWh reported for the program

Realization rate = kWh_{adj} / kWh_{rep} for the research sample

Net impacts are determined through surveys of program participants and non-participants and analysis of commercially available market characterization data (for example, number of sales of EnergyStar™ refrigerators in a program area). Net impacts are captured by three metrics: free ridership, the percent of savings that customers would have realized without a program's intervention; participant and non-participant spillover, additional savings that have occurred because of a program's operations but outside of its administrative framework. These three metrics are combined into a net-to-gross ratio as shown in Equation 5.

Equation 5

$$NTG = (1 - FR + PSO + NPSO)$$

Where:

FR = Free ridership

PSO = Participant Spillover

NPSO = Non Participant Spillover

Finally, net impacts are determined by multiplying the gross savings by the net-to-gross ratio as shown in Equation 6.

Equation 6

$$kWh_{net} = kWh_{adj} \cdot NTG$$

Because development of the net-to-gross ratios used to determine the impacts requires data collected through surveys of program participants and non-participants, the entire GDS team will be closely integrated into this task and will work closely and continuously with the EDCs. We expect to take advantage of this integration to control the development of appropriate sample sizes and survey response rates by using subsets of the samples drawn for the process evaluation, discussed later in this section, for the gross impact sample. Sharing samples reduces the number of customer records needed from the EDCs and thus helps control costs. Thus, the spillover and free rider surveys can be administered in conjunction with site visits conducted as part of the gross impact studies; we expect a higher response rate by the administration of both surveys on-site than would be obtained by telephone surveys alone.

The basic impact evaluation tasks for the GDS Team are to:

- Review current program procedures for calculating energy savings. Note compliance with accepted engineering and M&V procedures as addressed in the Technical

Reference Manual (TRM). Provide recommendations as needed for improving savings calculations.

- Review files for projects in sample for compliance with program procedures and M&V guidelines. Check sample projects for cross participation in other programs. Review savings at the measure level. Adjust as needed.
- Contact site customer and conduct telephone survey/field investigation for data collection and to verify equipment installation and operation. Adjust savings as needed to reflect actual installation. (This task will be carried out primarily by the EDCs with their respective customers. The GDS team will provide guidelines for these surveys as outlined in the Audit Plan and will conduct a small sample of spot-checks to ensure that the inspections are being done according to protocol.)
- Develop realization rates and apply to each EDCs reported savings to adjust for M&V findings.
- Prepare written report of activities and findings.

The remainder of this Section provides details about each of these components required for the impact evaluation and describes how the GDS team will perform them as part of the EE&C program evaluation.

Audit/Impact Task 1: Draw Sample

Prior to and during the kickoff meeting, the GDS team will obtain the lists of energy efficiency projects and participants that EDCs will need to draw samples for each of the programs and sectors subject to a full impact review. We generally use stratified sampling techniques to determine sample sizes, and we will examine the program tracking databases to identify logical strata. A frequent stratification scheme is to weight the sample towards the largest contributors to a program's savings.

We will organize the kickoff meeting to focus on obtaining and understanding the data tracking records and other lists that we will need to proceed. We plan to bring our standard list of data requests for the EDC's to the kick-off meeting for discussion with Commission staff. A closely related task is to obtain copies of each EDC's filed records once the sample is drawn, and we expect to complete much of this during our kickoff meeting.

The sample sizes for each program will be determined based on a pre-specified confidence level and margin of error. The samples will be based upon an assumed coefficient of variation of 0.52 at 90 percent level of confidence and 10 percent precision (margin of error) for each program. For programs with limited participation, a finite population correction factor (fpcf) will be used to determine the appropriate sample size.

While the actual reported savings numbers on a program-by-program basis will vary, it is advantageous to employ value of information (VOI) considerations when evaluation efforts may be large compared to risk, savings and funding levels.

² The coefficient of variation is a measure of variance in the parameter being investigated and is defined as the standard deviation of the particular value being evaluated divided by the mean.

Audit/Impact Task 2: Design Surveys

Gross impact data collection input forms will be developed for use by field survey engineers and for ease of input into a data collection database. The approach we will use in this project for data collection are as follows:

- 1) Review programs and the existing Technical Reference Manual to develop the engineering methodology for the evaluation of program savings on a measure-by-measure basis.
- 2) Develop a project and measure specific M&V plan including a metering protocol if required.
- 3) Select information that is required to perform the needed impact evaluation tasks.
- 4) Build a relational database with necessary inputs.
- 5) Build a database form within the database to allow for quick and easy population of tables with data and information.
- 6) Depending on the nature of the data to be collected, the field data collection will either be done using direct input into the database using a laptop computer, or forms will be printed out so that the field inspector can fill out the forms by hand.

The attribution surveys for net impact analysis will be developed to assess the following attributes:

Free Ridership

The responses to the sequence of free ridership questions will be used collectively to compute an overall free ridership score for each measure. It is very important that more than one question be used to determine the level of free-ridership. A measure will be considered a full free rider when the respondent:

- Had already planned or ordered the measure prior to program participation;
- Had the extra money available in the absence of program funding, and would have paid for the entire measure cost;
- Would have specified the same quantity of measures; or
- Would have specified the same efficiency of measures.

If the respondent would have specified more than 0 percent and less than 100 percent of the measures, they will be considered partial free riders. The free ridership estimates will be developed such that the statistical precision at the measure category level (lighting, HVAC, motors, etc.) is 90 percent \pm 20 percent and at the program level is 90 percent \pm 10 percent.

Participant Spillover

A measure within a participating project will be considered as a spillover adoption if (1) the measure is program-qualifying, or above code; (2) the project did not receive any rebate for the measure (through any channel); and (3) the respondent reports a sufficient level of program influence to indicate they would not have installed the measure (or the same number of measures) in the absence of the program.

Non-Participant Spillover

When a trade ally reports the following responses, then the measure will be considered as non-participant spillover:

- Installed measures in non-participating projects that were similar to measures funded in participating projects, or above code;
- Installed these measures without a program incentive; or
- The program exerted a sufficient degree of influence on this decision to indicate they would not have installed the measures in the absence of program participation.

Audit/Impact Task 3: File Reviews

Prior to final development of the evaluation databases and forms, analysis methods for each program and measure will be developed and quality controlled (QC'd).

The engineering review will be conducted to answer the following questions:

- Are the data files of the sampled projects complete, well documented and adequate for calculation and reporting of the savings?
- Are the calculation methods used appropriate, correctly applied and accurate?
- Are all necessary fields properly populated?
- Are measures properly installed as described in the program tracking and reporting system?

Desk review of projects will be conducted in preparation for the site visits and completed when the site visit is complete.

Audit/Impact Task 4: Site Inspections

Site inspections are essential to the accurate evaluation of programs and represent a significant portion of the effort. Because of the importance of this task, the GDS team will work closely with the EDCs to ensure that site inspections are carefully planned and executed and that site inspectors have the appropriate experience and training. Steps in the site inspection process are as follows:

- 1) Train site inspectors so that they can successfully collect the needed site-specific information. It is important that the inspectors are trained not only on the engineering aspects, but also on proper protocols and interaction with residents and facility staff to ensure that the necessary data is collected and that each EDC's relationship with its customers is not damaged, but rather is enhanced. The GDS Team has experienced and trained site inspectors.
- 2) Draw random sample of sites to be inspected.
- 3) Develop database and site inspection forms.
- 4) Group inspections by geographic location to minimize time allocation, labor and direct costs associated with getting to sites and conducting inspections.
- 5) Contact sites prior to any visit to ensure availability and so that the resident or facility staff is not 'surprised' by the visit.
- 6) Perform site inspections and enter all needed data into the program evaluation database.

Audit/Impact Task 5: Administer Surveys

The GDS team, as part of both the impact and process evaluations, will be interviewing and surveying a random sample of program administrators, implementation contractors, participants, end-user program participants, and program non-participants.

Primary participant surveys and their administration will be designed by the GDS team in conjunction with the EDCs, directed and conducted primarily by the process evaluation teams of each EDC. Because net savings will be calculated using the result of surveys conducted during the process evaluation, the GDS team will work closely with the EDCs' process evaluation teams to be sure that results are accurate and collection is done in a synergistic way.

We have built into our proposal the flexibility to use a survey house to assist the team in gathering the information from phone interviews once this phase of the project begins. The phone surveys will be conducted using a Customer Assisted Telephone Interviewing (CATI) system to minimize data entry and skip pattern errors. The final data analysis will be conducted by the GDS Team using SAS statistical software and will include a full set of frequencies, cross-tabulations, and detailed analysis and recommendations.

Audit/Impact Task 6: Data Analysis (Gross Impacts)

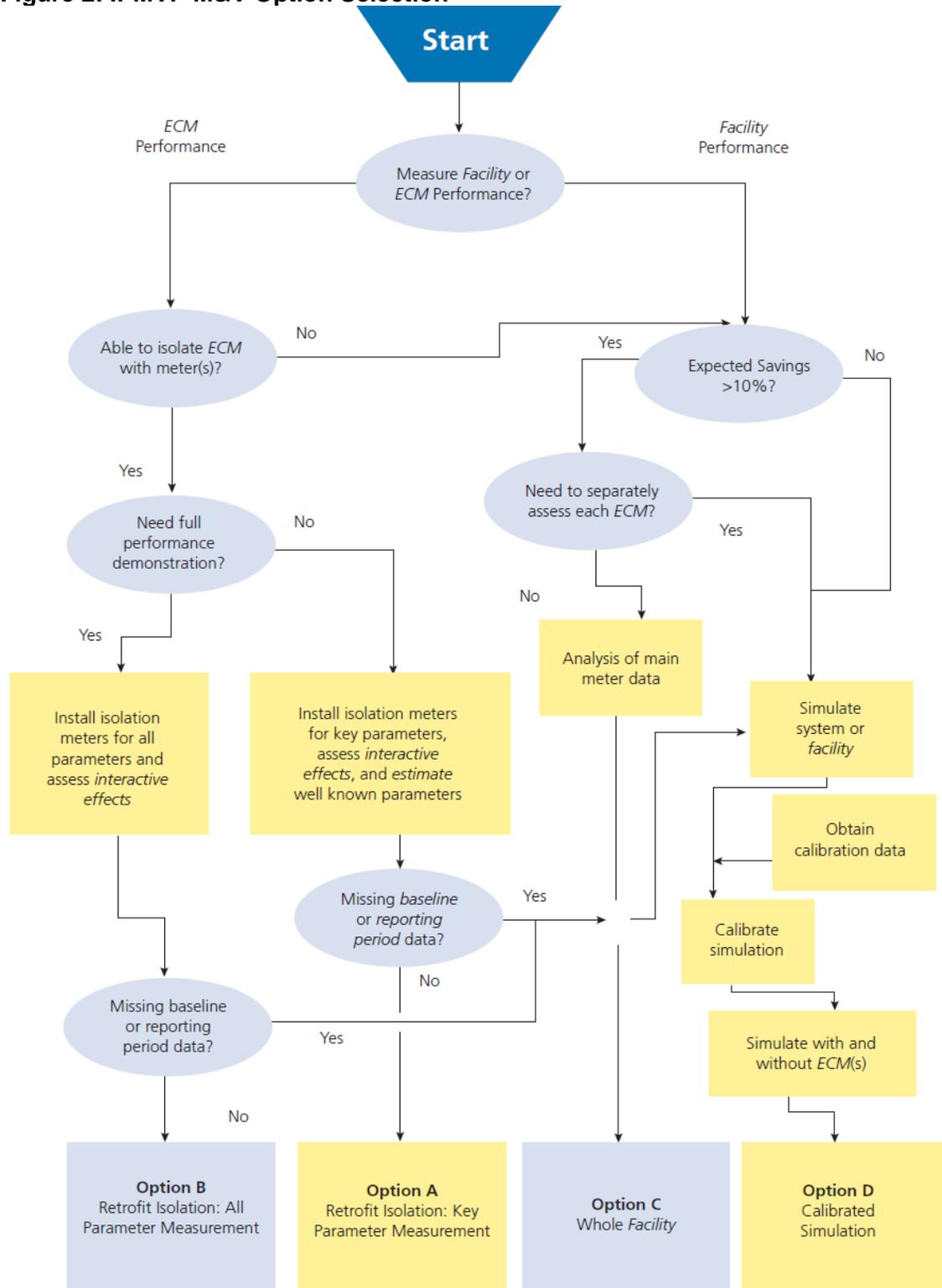
Data analysis will be conducted on a project-by-project, then program-by-program, sector-by-sector, and rolled up to evaluate the gross and net impacts of groups of programs. The analysis will include the cost-benefit evaluation at the program and sector levels.

The verification of achieved savings will be based on the M&V approach selected for evaluation of the sample projects. The M&V approach selected will be based on a careful review of the project intricacies, including savings levels and type of Energy Conservation Measures (ECMs) installed. In general, M&V methods will be developed with adherence to the International Performance Measurement and Verification Protocol (IPMVP) and the Technical Reference Manual (TRM). The broad categories of the IPMVP are as follows:

- Option A –Retrofit Isolation – End-use measurements, key parameters
- Option B – Retrofit Isolation – Complete end-use measurements
- Option C – Whole Building – Billing analysis on multiple systems
- Option D – Calibrated Simulation – Computer modeled building savings

Figure 2 shows a flowchart summarizing the selection of the IPMVP M&V Option appropriate for a particular program or project.

Figure 2: IPMVP M&V Option Selection



Our general approach will be to try to avoid ‘reinventing the wheel’ when there are calculations and methods that are available for review that are presented in a transparent and complete way.

In some cases, we may conclude that savings estimates and reports are either not adequately supported, or are not appropriate to the EDC's service territory. In these cases, we will provide ground-up methods and calculations. Tools we may use to perform our analysis may include DOE-2 building modeling (we have libraries of both residential and C&I models to expedite any needed runs), REM/Rate residential modeling, commonly available tools such as Motor Master, Energy Star Calculators, and others. We also have a large amount of expertise and specialized in-house tools we will use to perform engineering analysis as needed.

As described elsewhere, the GDS team will use accepted evaluation practice and protocols to validly extrapolate savings and realization rates from our sample findings.

The GDS team has deep energy engineering expertise and measurement and verification qualifications that we feel differentiates us from other companies that offer evaluation services.

Table 4 provides a preliminary and high-level example summary of the data collection and analysis methods envisioned for the engineering review by program.

Table 4: Program Description and Examples of Engineering Analysis Approaches for Typical Energy Efficiency Programs

Program Name	Measures / Highlights	Data Collection Methods and Yearly Sample Sizes	Engineering Review Activity on each sample
Residential New Construction Program	<ul style="list-style-type: none"> - High Efficiency Heating/Cooling - Higher Insulation Levels - High Performance Windows - Reduced Air Infiltration - House-as-a System Concept - Contractor Certified Homes - <85 Points HERS Rating 	<ul style="list-style-type: none"> - Telephone surveys (tied into net impacts analysis and process evaluation) - On-site visits (Subset) - Telephone surveys will help gather data to feed engineering analysis - On-sites will help conduct testing and metering 	<ul style="list-style-type: none"> - Blower Door/Duct Blaster Tests - Collect nameplate info (type, efficiency, rating, size etc.) - Metering activities (install hourly meter, collect billing data) - Calculate HERS rating using (REM/Rate Software) - Deploy loggers (lighting, TOU, kW short term metering) - Conduct RESFEN, DOE2 simulations
Residential Existing Homes Program	<ul style="list-style-type: none"> - HPwES (Energy Star Furnaces, - Residential Air Conditioner & Heat Pump Rebates - Low Income Housing Retrofits (Appliances, Air Sealing/CFLs etc.) - Central Air Conditioning Retrofits - Water Heaters, Thermostats 	<ul style="list-style-type: none"> - HPwES Telephone Surveys and Metering/Bill Analysis, 10 Site Inspections (Subset) - Direct Installs, 10 Site Inspections - Low Income Telephone Surveys and Metering/Bill Analysis. Site Inspections (Subset) - Residential AC Rebate Surveys and Analysis and 10 Site Inspections (Subset) 	<ul style="list-style-type: none"> - Verify installation, conduct audits - Metering activities (install hourly meter, collect billing data) - Collect nameplate info (type, efficiency, rating, size etc.) - Conduct RESFEN, DOE2 simulations - Collect data (house type, CAC/Furnace/Heater/AC model and efficiency (EER, COP, AFUE, R-value) - Collect Manual J Sizing Data - Perform engineering

Program Name	Measures / Highlights	Data Collection Methods and Yearly Sample Sizes	Engineering Review Activity on each sample
			calculations to calculate savings
Low-Income Residential Program	<ul style="list-style-type: none"> -HPwES (Energy Star Furnaces, -Residential Air Conditioner & Heat Pump Rebates -Low Income Housing Retrofits (Appliances, Air Sealing/CFLs etc.) -Central Air Conditioning Retrofits -Water Heaters, Thermostats 	<ul style="list-style-type: none"> -HPwES Telephone Surveys and Metering/Bill Analysis, 10 Site Inspections (Subset) -Direct Installs, 10 Site Inspections -Low Income Telephone Surveys and Metering/Bill Analysis. 10 Site Inspections (Subset) -Residential AC Rebate Surveys and Analysis and 10 Site Inspections (Subset) 	<ul style="list-style-type: none"> -Verify installation, conduct audits - Metering activities (install hourly meter, collect billing data) -Collect nameplate info (type, efficiency, rating, size etc.) -Conduct RESFEN, DOE2 simulations -Collect data (house type, CAC/Furnace/Heater/AC model and efficiency (EER, COP, AFUE, R-value) - Collect Manual J Sizing Data - Perform engineering calculations to calculate savings
Energy Efficient Products	<ul style="list-style-type: none"> -CFL, LED Direct Installs -Clothes Washers, Dehumidifiers, RACs -Energy Star Lighting, Appliances 	<ul style="list-style-type: none"> -Telephone Surveys -On site inspections on a subset of the sample (optional) 	<ul style="list-style-type: none"> -Review home energy audit, -Survey participants to verify installation, measure-by-measure evaluation: installation, energy savings calculation, reporting -Conduct light logger studies to collect data on hours of use of CFL and LED bulbs -Conduct billing analysis where reliable monthly billing data is available

Program Name	Measures / Highlights	Data Collection Methods and Yearly Sample Sizes	Engineering Review Activity on each sample
C&I New Construction Program	<ul style="list-style-type: none"> - Buildings operating at efficiency levels greater than state energy codes - High efficiency HVAC, Lighting, other equipment - <i>Prescriptive path:</i> Pre qualified measures and incentive based on performance - <i>Custom path:</i> Unique measure approved by the Authority, Performance bases incentives - <i>Whole Building Approach:</i> Conceptual design based approach for the entire building, performance based incentives 	<ul style="list-style-type: none"> - on site inspections - On site metering and logging of end use energy consumption parameters (kW, amperage, temperature, pressure etc.) 	<ul style="list-style-type: none"> - Review project records/site audits - Obtain list of installed measures for visual inspection - Develop metering plan/review existing metering records - Develop site inspection plan, conduct site inspection: obtain nameplate equipment information (model, efficiency etc.), conduct deemed savings review - Deploy metering equipment (if required) - Obtain energy savings calculation input parameters - Check compliance with code and calculate savings compared to energy code as the baseline - Calculate savings (engineering approach/billing analysis/DOE2 simulations)
C&I Existing Facilities Program	<ul style="list-style-type: none"> - High efficiency HVAC, Lighting, EMS systems, Refrigeration equipment - Retrocommissioning - <i>Prescriptive path:</i> Pre qualified measures and incentive based on performance - <i>Custom path:</i> Unique measure approved by the Authority, Performance bases incentives - <i>Whole Building Approach:</i> Conceptual design based approach for the entire building, performance based incentives 	<ul style="list-style-type: none"> - on site inspections - On site metering and logging of end use energy consumption parameters (kW, amperage, temperature, pressure etc.) 	<ul style="list-style-type: none"> - Review project records/site audits/retro commissioning study - Obtain list of installed measures for visual inspection, review ESCO submittals - Develop metering plan/review existing metering records - Develop site inspection plan, conduct site inspection: obtain nameplate equipment information (model, efficiency etc.), conduct deemed savings review - Deploy metering equipment (if required) - Obtain energy savings calculation input parameters - Calculate summer co-incident peak demand savings - Calculate savings (engineering approach/billing analysis/DOE2 simulations)

The above table does not include an M&V approach for the Informational/Educational offerings or Renewable offerings. The GDS team has extensive experience developing, implementing and evaluating such portfolios. As a team we have conducted several renewable market assessment studies, impact evaluation studies, financial analyses, environmental analysis, and economic feasibility studies for solar electric, solar thermal, geothermal, and solar PV projects. In addition, we have conducted dozens of impact and process evaluation of Direct Load Control Programs for our nationwide clients including Consolidated Edison in New York. Evaluations of the Cool Homes and REAP offerings are included in the program groups above. We will develop individual plans for any renewable offerings, as required, after gathering further information on range and scope in particular program.

Audit/Impact Task 7: Data Analysis (Net Impacts)

Our proposed approach estimates net energy savings—which means energy savings adjusted for the energy savings that would have occurred for participants over the same period whether the program was offered or not.

The responses to the sequence of free ridership questions posed in the surveys will be used collectively to compute an overall free ridership score for each measure. This score will be multiplied by the energy savings for each measure and then cumulatively summed in order to estimate the amount of energy savings that were not influenced by the program.

The number and type of measures with spillover attributes will be multiplied by the energy savings attributed to each measure and cumulatively summed. The quantity of measures funded by the program is subtracted from the cumulative figure.

The Net-to-Gross ratio will be calculated from the estimates of free ridership and spillover as follows:

$$\text{NTG ratio} = (1 - \text{FR} + \text{PSO} + \text{NPSO})$$

FR is the free ridership fraction, PSO is the participant spillover fraction, and NPS is the nonparticipant spillover fraction.

In addition to providing estimates of net energy savings, the GDS team recognizes the need to have net-to-gross ratios, or estimated net impacts factors, for each program by which it can more transparently and accurately communicate program progress through annual or quarterly reports. For each program being evaluated, we will examine opportunities for specifying such net-to-gross ratios and estimated net impact factors, and assess their feasibility and applicability for doing so. Such factors can represent oversimplifications that are highly dependent upon scale, program implementation dynamics, and technology, to name a few. On the other hand, some programs may not be impacted at all by market responses and all savings are completely due to the program itself. To ensure the feasibility and applicability of any factor estimates we specify, we will describe the key assumptions that drive these factors and the uncertainty around them. Additionally, we will explore “best practices” from other States in terms of simplified net savings estimation methods for comparable programs, and document comparable practices and net savings factors from the literature within each program’s individual impact evaluation assessment.

Audit/Impact Task 8: Assessment

Following this impact evaluation process and utilizing the data provided by the EDCs and verified through GDS audits, the final assessment will involve:

- A review and critique of the EDCs' reported energy and demand savings utilizing field verification, Technical Reference Manual derived savings, approved custom measure derived savings, measurement and verification, and large scale billing analyses.
- A verification of the cost-effectiveness of EDC plans using the Commission adopted Total Resource Cost Test.
- A review of each EDC's plan to determine whether they are meeting energy savings and load reduction targets.
- Recommendations, in the form of best practices and based on the portfolio of impact assessments, for each EDC's EE&C plan in order to improve realized energy and demand savings.

Audit/Impact: Task 9: Cost-Effectiveness Assessment

Results from the EDCs surveys and site-inspections, evaluation reports, and the GDS team's impact evaluations will be utilized as inputs to our team's benefit/cost model and other models, as appropriate, to assess the cost-effectiveness of the EDCs' efforts at the measure, program, sector and portfolio levels where required. The GDS team has substantial experience developing cost-effectiveness analysis models and using those models to calculate benefit/cost ratios for energy efficiency program administrator clients nationwide. For example, GDS just completed a cost-effectiveness analysis project for five of the Commonwealth of Massachusetts' gas energy efficiency program administrators using its combined electric and gas energy efficiency, spreadsheet based cost-effectiveness screening tool (which has been reviewed and accepted by numerous regulatory agencies as an appropriate tool in multiple jurisdictions).

The GDS Associates Cost-Effectiveness Screening Tool calculates numerous benefit cost ratios including the Total Resource Cost Test, the Societal Test, the Participant Test, the Utility Test and the Ratepayer Impact Test. In accordance with the requirements of the Commission for determining cost-effectiveness, the EDC's EE&C programs will be evaluated based on the Total Resource Cost (TRC) test. The general benefits and costs included in a TRC test are summarized below:

Benefits:

- *Energy System Benefits*
 - *Avoided Energy Supply Costs* - The avoided energy supply cost factors to be used in these cost-effectiveness determinations will be based on the appropriate EDC specific Avoided Costs (electric, natural gas, T&D and other) as available at the time of our analysis.
- *Program Participant Benefits*
 - *Participant Resource Benefits* - to account for reduced consumption of electricity, natural gas, water, and other resources as a result of the implementation of energy efficiency programs and calculated as the product of (a) the reduction in consumption of electric energy and demand, natural gas, water, and other resources, and (b) avoided costs factors for each of these resources. To the greatest extent practical, common assumptions regarding savings per measure/participant, measure lives, etc. should be used with sources identified and documented. A majority of these values will come directly from the impact evaluation results, while others (i.e., measure lives) will come from other sources and should be checked for consistency and applicability.

- Participant Non-Resource Benefits including: reduced costs for operation and maintenance associated with efficient equipment or practices; the value of longer equipment replacement cycles and/or productivity improvements associated with efficient equipment; reduced environmental and safety costs (i.e., those for changes in a waste stream or disposal of lamp ballasts or ozone-depleting chemicals); reduced disconnections for inability to pay.

Costs:

- *Energy System Costs*
 - *Program Administrator Costs* including: payments to vendors for energy efficient equipment and services; payments to contractors to plan for and/or install energy efficient equipment; rebates or incentives paid to program participants or vendors for energy efficient equipment and/or services; costs to check for proper functioning of and maintenance of installed equipment; costs to market energy efficient equipment and services to customers and to seek participation in energy efficiency programs; and costs to develop, plan, administer, monitor, and evaluate energy efficiency programs.
 - As with benefits above, a majority of these values will come directly from the Impact evaluation results and associated program records, while others (i.e., measure specific installed unit costs) will come from other sources and should be checked for consistency and applicability to the region.
- *Program Participant Costs*
 - All expenses incurred by program participants as a result of their participation in energy efficiency programs including: net cost of the energy efficient equipment (e.g.; incremental participant costs); cost to plan for and install the energy efficient equipment; and cost of the energy efficiency services (i.e., inspections for proper equipment functioning)

Discount Rate:

Benefits and costs will be stated in present value terms, using the appropriate discount and inflation rates.

All results will be summarized at the program, sector and portfolio levels, as may be appropriate, and copies of all benefit cost analyses (and associated models) will be made available to each EDC for their records and future sensitivity analysis purposes. Collectively, the GDS team's cost-effectiveness analysis credentials are a unique and valuable component of this proposal.

Audit/Process Task 10: Process Assessment

As shown in Table 3 below, the process evaluation has fourteen objectives, most of which require multiple sources of information to fully address.

Table 5 shows the information sources that will be used to meet each objective. An "X" in a cell indicates the objective given by the row will be assessed relying on data from the source given by the column. An "S" in a cell indicates the source will provide secondary or supporting information.

Table 5: Information Sources to Be Used to Meet Process Evaluation Objectives

Objective— To Assess:	Information Sources					
	Program Documents	Interviews		Surveys		
		EDCs	GDS Team	Participating Customer	Participating Trade Ally	Nonparticipating Customer
Appropriateness of design	Descriptions Design docs	X	X	X	X	X
Appropriateness of participation procedures	Process descriptions Flow charts Application forms	X	X	X	X	X
Appropriateness of application and payment processing activities		X	X	X	X	
Accuracy, consistency, completeness of program records	Participant program records	X	S			
Effectiveness of incentives in motivating action	Incentives Rationale (e.g. percent buy down)	S	S	X	X	X
Effectiveness of marketing	Marketing materials	X	X	X	X	X
Effectiveness of internal communication		X	X			
Participant satisfaction with programs		S	S	X	X	
Opportunities for process improvement		X	X	X	X	S
Comparison to best practices	All program documents	X	X			
Obtain data for assessment of free riders and free drivers		X		X	X	X
Obtain data for assessment of savings persistence		S		X		
Obtain data for assessment of “spillover” into non-NEW areas		S		X	X	X

Sampling Strategies

For this task to be cost-effective, we propose that the sampling methodology employ a risk-based framework, and a two-stage auditing approach. We would propose implementing the following:

- *Establish a risk-based sampling framework:* This framework would establish selection criteria considering the incentive amount, the amount of the savings claim, and the percentage of the savings claim relative to base-case energy consumption. Other parameters may also be employed in the selection framework (such as the size of the project and subjective elements such as the presence of complicating factors such as project delays or changes in project scope).
- *Sample Size:* We will ensure that the sample size of projects selected for the process evaluation audit allows us to reach greater than 80 percent confidence with ± 20 percent precision (this is the level of precision required by the RFP). For client populations less than 100, the entire population will be surveyed.
- The sampling size would be adjusted according to statistical best practice based on pass/fail audit results and would be adjusted accordingly to maintain desired confidence and precision levels.

Process Evaluation Tasks

The basic process evaluation tasks are: (1) create samples and surveys, (2) collect data, (3) analyze data, and (4) report on findings.

The process evaluation lead will participate in the project initiation meeting. As mentioned, at that time we will need to receive all requested documents and data from each EDC. In addition, at the time of the meeting, the process lead will conduct preliminary interviews with the corporate DSM program staff to begin understanding how the programs work and the key issues facing each program. If there is sufficient time, these interviews can fully cover the programs and there will not be a need for additional interviews with corporate DSM program staff. More likely, these interviews will be preliminary—a necessary foundation to support drafting the program surveys, but insufficient to fully understand the programs. In this case, the process team will need to also conduct in-depth interviews with the program staff by telephone, subsequent to the initiation meeting. The process evaluations will be conducted in the later part of years 2010, 2011, and 2012.

Following the initiation meeting, the process and impact teams will work together on the DSM evaluation plan. Close coordination will be required on integrating the process and impact customer data collection activities for programs with small numbers of participants.

Audit/Process Task 11: Create Samples and Surveys

Our philosophy of allocating evaluation resources to a program's greatest impacts and greatest uncertainty underlies our sampling design for each program. We will ensure that the sample size of projects selected for this audit task allows us to reach the desired 80 percent confidence with ± 20 percent precision. The actual sampling size would be adjusted according to statistical best practice based on pass/fail threshold for applicable measures identified and would be adjusted accordingly to maintain desired confidence and precision levels.

Audit/Process Task 12: Collect Data

We will begin the process evaluation planning by establishing the range of possible activities and identifying which data collection efforts should be a part of the program-specific evaluation

tasks. The following list of data collection activities represent the tool library that is typically associated with the process evaluation efforts. It is this tool library that the evaluation team will use to identify the tasks that will be associated with the process evaluation.

- Interviews and surveys with administrators, designers, managers and implementation staff (including contractors, sub-contractors and field staff);
- Interviews and surveys with trade allies, contractors, suppliers, manufacturers and other market actors and stakeholders;
- Interviews and surveys with participants and non-participants;
- Interviews and surveys with technology users, developers, and decision makers;
- Interviews and surveys with key policy makers and program stakeholders;
- Observations of operations and field efforts, including field tests and investigative efforts (conducted as part of our annual audit);
- Operational observations and field-testing, including process related measurement and verification efforts (these can be announced or unannounced and conducted as part of our audit);
- Workflow, production and productivity measurements, observation and testing;
- Reviews, assessments and testing of internal and external program-related records, databases, marketing approaches and materials, customer outreach presentations and promotion, decision-support materials and other program-related materials and tools; and
- Collection and analysis of relevant data or databases from third-party sources (e.g., equipment vendors, trade allies and stakeholders and market data suppliers).

Audit/Process Task 13: Best Practice Research

Another factor considered as we developed our portfolio evaluation approach and budget was the balancing primary and best practice research. While primary research is typically preferable, the marginal benefit it offers does not always outweigh the additional cost. As a result, it is critical to assess each data collection effort individually to determine the appropriate research approach.

To provide the Commission and the EDCs with accurate yet cost-effective process evaluations, we will establish guidelines for using best practice research. To decide when to employ each approach, we assessed (1) the availability and applicability of the data sources, and (2) the increase in precision gained from collecting primary data. In some cases, we may propose a hybrid approach.

Audit/Process Task 14: Fielding Surveys and Interviews

For the customer surveys for the process evaluation, we propose to examine a number of topics, such as:

Customer Satisfaction

- Were the program materials clear and easy to understand?
- Was the enrollment process straightforward?
- Did the respondent have any measures installed by the program?
- Did the installer arrive on time?
- Did the installation go smoothly?

- Is the respondent satisfied with the installed measures?
- Has the respondent noticed any energy savings?

Educational Component

- Were the educational materials clear and easy to understand?
- Was the in-person customer educational component helpful?
- What energy-saving tips does the respondent remember?
- Has the respondent adopted any of the recommendations? Which ones?

We will use experienced in-depth interviewers on our team to gather this information. The surveys will be conducted using a detailed in-depth interview guide. The final data analysis will be conducted by our experienced interviewers and the final report will include summaries of the responses for key research issues as well as key findings and recommendations.

Audit/Process Task 15: Analyze Data

The analysis has three steps; the first is to analyze the quantitative survey results. We take a conservative statistical analysis approach, making sure that the data match, as well as possible, the statistics applied to it. While we have often found that the most straightforward statistics (i.e., frequencies, cross-tabulations) are the most powerful and understandable for many audiences, members of our team are highly capable of applying higher order statistics to data (i.e., analysis of variance and linear regression).

The second is to analyze the qualitative interview results. For qualitative data, the evaluation team may use a qualitative analysis tool to assist in coding and analyzing responses. This approach allows the researcher to carefully read and code responses while tracking larger themes that emerge across interviews and populations.

The third step will be to draw comparisons between the best practice results and the EDC EE&C programs. We will take the result of the best practice research and in our recommendations reference to the best practice studies.

Audit Task 16: Workshops

To ensure that all of the M&V efforts are coordinated and in compliance with the approved Audit Plan developed in PHASE I, the GDS team will provide semiannual workshops with representatives from each EDC, the Commission Staff, and any other necessary parties as deemed appropriate by the Commission. These workshops will focus on the M&V practices, evaluation process, and the progress of the audit. The workshops will be designed so that all parties can provide input into the design of the audit and evaluation process as well as discuss identified best practices and areas for improvements. These workshops will help to ensure that all EDCs are performing evaluations of equal quality and substances as well as implementing programs so as to reach savings targets in the time allotted.

The GDS team will create the agenda and run this workshop in addition to distributing workshop minutes, findings, and materials within 5 business days of the workshop to all parties in attendance.

Audit Task 17: Reports

Quarterly Reports

GDS will submit quarterly reports to the Commission with updates on impact evaluations, cost-effectiveness, and process evaluations. Additionally, these reports will include identify any best practices exhibited to date as well as areas for improvements. The reports will also include any recommendations, if necessary, for updating targets or expectations based on the current findings of the

Annual Reports

The GDs team will assure and report both gross and net savings at the customer meter for each program, and for all programs combined. The gross impact evaluation will be coupled with the process evaluation to develop net-to-gross ratios to estimate net program impacts. Reports will include the following data for each program and combinations of programs so that information is reported by end-user market sector (residential, low-income residential, commercial/industrial, and governmental, education, and non-profit entities)

- Annual kWh savings
- On peak demand kW reduction coincident with the summer peak

The reports will include savings estimates

- For each program year
- Cumulatively, for all program years

Savings estimates will be reported both as a point and as a range with upper and lower bounds on the point estimate. The range will be reported at the 90 percent confidence interval, and the precision for each point estimate will also be reported (this confidence is based on suggested sample size addressed in the Audit Plan as approved by the Commission in PHASE I.

The reports will contain a complete description of the review plan, the review activities and the findings. They will contain all documentation reasonably needed to follow the analysis starting with each measure and project in the sample up to the final realization rates and their application to each EDC's reported savings. Our annual reports will be structured to achieve the following objectives:

- Improve integration of evaluation results and allow cross cutting review of programs
- Ensure greater consistency in evaluation approaches
- Consolidate all evaluation reviews
- Achieve better co-ordination with implementation contractors and other evaluation contractors
- Easy access to program reports, important findings and recommendations, and program matrices
- Easy to read graphic illustrations minimizing lengthy descriptions and write ups

Following is a preliminary outline for the annual evaluation report:

- An executive summary.
- A discussion of the methodology used in the evaluation and audit, highlighting any changes to the process year-to-year.
- A description of the data-collection, matching, and cleaning process.
- A detailed discussion of all the findings (verified on the audits), including the total energy and demand impacts (realization rate) by EDC, program, and sector.

- An assessment of tracking and calculation of energy savings, customer satisfaction, trade-ally satisfaction, educational component, and missed opportunities analysis.
- An assessment of each EDC's plan to determine whether EDCs are meeting energy savings and load reduction targets.
- A review of each EDC's M&V plans and execution of said plans, with a list of recommendations and updates as necessary.
- A conclusion addressing the status of the overall portfolio of programs in terms of meeting the energy and demand savings targets and the cost-effectiveness of the programs offered.

The GDS team will provide and retain an evaluation report for each project sampled and inspected by the impact assessment team for each EDC. The report will include a short summary of project findings and an Excel spreadsheet with backup engineering calculations and metered data. We will present well documented graphs and charts which will help draw conclusions for and make recommendations to the EDCs for the project under consideration. If computer energy simulations (RESFEN, DOE2 etc.) or billing analysis, benchmarking (Energy Star Portfolio manager, regression analysis etc.) are conducted we will include the results with the project report as well. Backup software files will be available upon request.

All project level reports will be compiled in a single document to add to the annual evaluation report for each program and the entire portfolio. The project summaries (without reference to the actual participants) will be included in the Appendices. All project specific information will be kept confidential where necessary.

In addition to providing estimates of net energy savings, the GDS team recognizes the need for each EDC and the Commission to have documented net-to-gross ratios by program or measure category (lighting, HVAC, etc.), or estimated net impact factors, for each program by which it can more transparently and accurately communicate program progress through annual or quarterly reports. Such factors will be well documented in our project and program specific reports.

GDS understands that general timeline for this process regarding hard report deadlines is as follows:

- 1) EDC provides its Annual Report to the Commission on July 15.
- 2) The GDS team will provide a draft annual report on each EDC plan to the Director of CEEP and the EDCs by August 15.
- 3) EDCs will have 15 days to provide comments on the draft annual report to the Director of CEEP.
- 4) Commission Staff will review the draft annual reports and EDC comments and provide Commission Staff determined revisions to annual reports to the GDS team by September 15.
- 5) The GDS team will provide a final annual report on each EDC plan to the Director of CEEP by October 15.

Table 6: Phase II – Tasks, Deliverable and Dates:

Task:	Deliverables:	Dates:
1. M&V Audits		Within 6 Months of July 15
2. Process Surveys		Within 6 Months of July 15

3. Review and evaluate EDC Annual Reports - Impact.		To commence: Annually on July 15 th and Completed: Annually August 15 th .
4. Review and evaluate EDC Annual Reports – Cost-effectiveness		To commence: Annually on July 15 th and Completed: Annually August 15 th .
5. Evaluate process survey results		To commence: Annually on July 15 th and Completed: Annually August 15 th .
6. Quarterly Reports to the Commission	<ul style="list-style-type: none"> • Update & Progress Reports 	Every 3 Months
7. Semiannual Workshops	<ul style="list-style-type: none"> • Agenda • Materials • Minutes 	Every 6 Months; Minutes to be distributed within 5 business days of Workshops
8. Annual evaluation reports	<ul style="list-style-type: none"> • Report 	Annually – August 15 th

Phase II – Team and Work Hours:

The team assigned to this task will include the consultants listed in the table below. Tom Londos, a Managing Director at GDS, will manage all aspects of the impact evaluation work. Robert Fratto, also a Managing Director at GDS, will manage all aspects of the process evaluation work. The anticipated time required by each team member for the tasks associated with PHASE II are outlined in Tables 7, 8, 9 and 10.

Table 7

Time Estimates for GDS Consultants by Task - Phase 2 (Y1) - Revised June 16, 2009														
TASK #	TASK DESCRIPTION EXAMPLES	President	Vice President	Principal	Managing Director	Senior Project Manager	Project Manager	Project Engineer/ Project Consultant	Senior Engineer/Analyst	Associate Engineer/Analyst	Senior Engineering Assistant	Executive Assistant	Engineering Assistant	Total Labor Hours By Task
1	Draw Sample	3	4	4	4	11	24	30	35	12	17	17	21	182
2	Design Surveys	3	4	4	4	11	24	30	35	12	17	17	21	182
3	File Review s	14	15	16	16	45	96	118	140	47	70	70	84	730
4	Site Inspections	3	4	4	4	11	24	30	35	12	17	17	21	182
5	Administer Surveys	3	4	4	4	11	24	30	35	12	17	52	63	259
6	Data Analysis (Gross Impacts)	34	38	40	40	111	236	290	343	114	172	172	206	1794
7	Data Analysis (Net Impacts)	34	38	40	40	111	236	290	343	114	172	172	206	1794
8	Assessment	34	38	40	40	111	236	290	343	114	172	172	206	1794
9	Cost-Effectiveness Assessment	34	38	40	40	111	236	290	343	114	172	172	206	1794
10	Process Assessment	34	38	40	40	111	236	290	343	114	172	172	206	1794
11	Create Samples and Surveys	7	8	8	8	23	48	59	70	23	35	35	42	365
12	Collect Data	3	4	4	4	11	24	30	35	12	17	52	63	259
13	Best Practice Research	14	15	16	16	45	96	118	140	47	70	70	84	730
14	Fielding Surveys and Interview s	3	4	4	4	11	24	30	35	12	17	52	63	259
15	Analyze Data	34	38	40	40	111	236	290	343	114	172	172	206	1794
16	Workshops	17	19	20	20	57	120	148	174	58	87	87	105	912
17	Reports	68	77	81	81	226	480	590	698	233	349	244	293	3418
Total Consultant Hours:		341	383	403	403	1131	2398	2952	3488	1163	1744	1744	2093	18243

Table 8

Time Estimates for GDS Consultants by Task - Phase 2 (Y2) - Revised June 16, 2009														
TASK #	TASK DESCRIPTION EXAMPLES	President	Vice President	Principal	Managing Director	Senior Project Manager	Project Manager	Project Engineer/ Project Consultant	Senior Engineer/ Analyst	Associate Engineer/ Analyst	Senior Engineering Assistant	Executive Assistant	Engineering Assistant	Total Labor Hours By Task
1	Draw Sample	3	3	3	3	9	20	24	29	10	14	14	17	150
2	Design Surveys	3	3	3	3	9	20	24	29	10	14	14	17	150
3	File Review s	11	13	13	13	37	79	97	114	38	57	57	69	598
4	Site Inspections	3	3	3	3	9	20	24	29	10	14	14	17	150
5	Administer Surveys	3	3	3	3	9	20	24	29	10	14	43	51	212
6	Data Analysis (Gross Impacts)	28	31	32	32	91	193	238	281	94	141	141	169	1470
7	Data Analysis (Net Impacts)	28	31	32	32	91	193	238	281	94	141	141	169	1470
8	Assessment	28	31	32	32	91	193	238	281	94	141	141	169	1470
9	Cost-Effectiveness Assessment	28	31	32	32	91	193	238	281	94	141	141	169	1470
10	Process Assessment	28	31	32	32	91	193	238	281	94	141	141	169	1470
11	Create Samples and Surveys	6	6	7	7	19	39	48	57	19	29	29	34	299
12	Collect Data	3	3	3	3	9	20	24	29	10	14	43	51	212
13	Best Practice Research	11	13	13	13	37	79	97	114	38	57	57	69	598
14	Fielding Surveys and Interview s	3	3	3	3	9	20	24	29	10	14	43	51	212
15	Analyze Data	28	31	32	32	91	193	238	281	94	141	141	169	1470
16	Workshops	14	16	16	16	46	98	121	143	48	71	71	86	748
17	Reports	56	63	66	66	185	393	484	572	191	286	200	240	2801
Total Consultant Hours:		280	314	330	330	927	1965	2419	2859	953	1429	1429	1715	14950

Table 9

Time Estimates for GDS Consultants by Task - Phase 2 (Y3) - Revised June 16, 2009														
TASK#	TASK DESCRIPTION EXAMPLES	President	Vice President	Principal	Managing Director	Senior Project Manager	Project Manager	Project Engineer/ Project Consultant	Senior Engineer/ Analyst	Associate Engineer/ Analyst	Senior Engineering Assistant	Executive Assistant	Engineering Assistant	Total Labor Hours By Task
1	Draw Sample	3	3	4	4	10	22	27	32	11	16	16	19	167
2	Design Surveys	3	3	4	4	10	22	27	32	11	16	16	19	167
3	File Reviews	12	14	15	15	41	88	108	127	42	64	64	76	667
4	Site Inspections	3	3	4	4	10	22	27	32	11	16	16	19	167
5	Administer Surveys	3	3	4	4	10	22	27	32	11	16	48	57	237
6	Data Analysis (Gross Impacts)	31	34	36	36	102	215	265	313	104	157	157	188	1639
7	Data Analysis (Net Impacts)	31	34	36	36	102	215	265	313	104	157	157	188	1639
8	Assessment	31	34	36	36	102	215	265	313	104	157	157	188	1639
9	Cost-Effectiveness Assessment	31	34	36	36	102	215	265	313	104	157	157	188	1639
10	Process Assessment	31	34	36	36	102	215	265	313	104	157	157	188	1639
11	Create Samples and Surveys	6	7	7	7	21	44	54	64	21	32	32	38	333
12	Collect Data	3	3	4	4	10	22	27	32	11	16	48	57	237
13	Best Practice Research	12	14	15	15	41	88	108	127	42	64	64	76	667
14	Fielding Surveys and Interviews	3	3	4	4	10	22	27	32	11	16	48	57	237
15	Analyze Data	31	34	36	36	102	215	265	313	104	157	157	188	1639
16	Workshops	16	17	18	18	52	110	135	159	53	80	80	96	833
17	Reports	62	70	74	74	207	438	539	637	212	319	223	268	3124
Total Consultant Hours:		312	350	368	368	1034	2191	2697	3187	1062	1594	1594	1912	16669

Table 10

Time Estimates for GDS Consultants by Task - Phase 2 (Y4) - Revised June 16, 2009														
TASK#	TASK DESCRIPTION EXAMPLES	President	Vice President	Principal	Managing Director	Senior Project Manager	Project Manager	Project Engineer/ Project Consultant	Senior Engineer/ Analyst	Associate Engineer/ Analyst	Senior Engineering Assistant	Executive Assistant	Engineering Assistant	Total Labor Hours By Task
1	Draw Sample	3	4	4	4	11	23	28	34	11	17	17	20	176
2	Design Surveys	3	4	4	4	11	23	28	34	11	17	17	20	176
3	File Reviews	13	15	16	16	44	93	114	135	45	67	67	81	704
4	Site Inspections	3	4	4	4	11	23	28	34	11	17	17	20	176
5	Administer Surveys	3	4	4	4	11	23	28	34	11	17	51	61	250
6	Data Analysis (Gross Impacts)	32	36	38	38	107	228	280	331	110	166	166	199	1732
7	Data Analysis (Net Impacts)	32	36	38	38	107	228	280	331	110	166	166	199	1732
8	Assessment	32	36	38	38	107	228	280	331	110	166	166	199	1732
9	Cost-Effectiveness Assessment	32	36	38	38	107	228	280	331	110	166	166	199	1732
10	Process Assessment	32	36	38	38	107	228	280	331	110	166	166	199	1732
11	Create Samples and Surveys	7	7	8	8	22	46	57	67	22	34	34	40	352
12	Collect Data	3	4	4	4	11	23	28	34	11	17	51	61	250
13	Best Practice Research	13	15	16	16	44	93	114	135	45	67	67	81	704
14	Fielding Surveys and Interviews	3	4	4	4	11	23	28	34	11	17	51	61	250
15	Analyze Data	32	36	38	38	107	228	280	331	110	166	166	199	1732
16	Workshops	16	18	19	19	55	116	142	168	56	84	84	101	881
17	Reports	66	74	78	78	218	463	570	674	225	337	236	283	3300
Total Consultant Hours:		329	370	389	389	1092	2315	2850	3368	1123	1684	1684	2021	17612

3.3 Phase III – 2013 Review

GDS understand that by November 30, 2013, and every five years thereafter, the Commission must evaluate the costs and benefits of the program and of approved EE&C plans. The evaluation must be consistent with a TRC test as determined by the Commission. And, if the Commission determines that the benefits of the program exceed the costs, the Commission shall adopt additional required incremental reductions in consumption.

In order to inform the Commission in this process, the GDS team will conduct a market potential study to determine the potential for additional incremental energy and load reductions after May 31, 2013. This potential study will include, but is not limited to, the following:

- An assessment and characterization of existing electric end-use baseline data on a customer class basis.
- An overview of the estimated share of electricity use by customer class and major end uses.
- A listing of available load shapes for each customer class.
- A listing of available information about total yearly sales of selected, key energy efficiency equipment, saturation levels of this equipment by customer class, and useful lives of the equipment.
- An assessment of the saturation of other energy efficiency measures, such as efficient industrial processes.
- An assessment of the prevalence of energy conservation behaviors of end users.

In addition to the potential study delivered to the Director of CEEP, the GDS team will provide an EE&C Five-Year Program assessment report to the Commission by October 15, 2013. This report should provide an analysis of the EE&C program's effectiveness up to May 31, 2013. The report will also provide suggestions for improving the program as a whole based on the previous annual evaluations and findings. Finally, the report will suggest whether the benefits of the program exceeded its costs and whether additional incremental reduction requirements should be imposed in the future, to include suggested energy and load reduction targets, target dates and funding levels. GDS understands that the Commission may require us to provide expert testimony to support these and other conclusions.

This assessment report will include, but is not limited to, the following:

- An analysis of the energy and load reductions achieved by EDC EE&C plans up to May 31, 2013.
- An analysis of energy and load reductions achieved by customer class over the entire program period.
- An analysis of overall costs incurred to obtain the energy and load reductions by customer class over the entire program period.
- An analysis of the cost effectiveness of the program as a whole.
- An assessment of future energy and load reduction potential to include target dates for achieving the targets.
- A recommendation of funding levels to achieve future reduction targets.
- An assessment of future energy and load reduction potential by customer class.
- Identification of best practices.
- Suggestions for improvements to the program as a whole.

The remainder of this section discusses GDS's proposed strategies for determining the savings potential beyond May 2013 and for assessing the 5-year EE&C program performances.

Task 1: Market Assessment

As part of determining the potential for additional incremental energy and load reduction after May 31, 2013, the GDS team will conduct a market potential study. GDS Associates will lead the market characterization and assessment (MCA) task for all programs. As noted in the RFP, and consistent with best practices and previous GDS MCA projects, key objectives of the MCA work will include:

- Determining attitudes and awareness of market actors
- Measuring market indicators
- Identifying market barriers, and options to reduce and/or eliminate them
- Conducting baseline studies, where needed, including updating baselines for energy efficient products, if necessary.

This MCA evaluation will be implemented through a collaborative effort between GDS and each EDC's evaluation and program delivery staff as needed or where appropriate to reduce costs. Results will provide the Director of CEEP and the Commission with insights and information to assist in decision-making regarding current and evolving program design and implementation strategies. All activities will be conducted to allow for comparison and retention of time-series data from prior EDC and GDS team evaluations wherever possible. This evaluation effort will also identify new areas of inquiry and will probe deeply into specific assessment areas to provide important insight on key program-related areas. The MCA work will be conducted on all EDC EE&C programs I in a staged manner over the contractual period.

These MCA evaluations will use a combination of primary and secondary data sources to generate information on a variety of topics to characterize the market for targeted program area and to report on program progress through the end of the program study period, including overall market and sub-market program participation, participation patterns, degree of savings by market area, and a partial analysis of market actor influence on program success.³ Further, qualitative information will be analyzed to assess targeted market actors' persistence of knowledge and understanding of energy efficiency. Changes in energy consumption, awareness and business practice behavior will also be examined. For each LIPA program to be evaluated, the following steps will be taken:

Initial secondary data collection and review

- The purpose of this initial review will be to identify and document key program design, delivery and evaluation elements and accomplishments prior to meeting with EDCs' program staff and to assess the various sources' value for supplementing current evaluation activities
- All items will be organized in a logic model format identifying key program activities, anticipated outputs, outcomes and potential market barriers and external influences. Where available, the GDS team will review and use information from existing program logic models, or will develop such models to help ensure that evaluation design matrices and data collection efforts are based on prioritized program and market progress indicators that will allow for consistent tracking of data over time.

³ Verified savings impacts and causality assessments are being conducted separately under the Impact Evaluation elements of this project.

- A preliminary list of measurement indicators (those currently being collected and those, perhaps, that should also be collected) will be developed

Discussions with EDCs program design, delivery and implementation staff

- The purpose of these discussions will be to ensure proper understanding of key program elements and accomplishments and to identify and collect other potential secondary data sources for more extensive review including:
 - Program participation data and target market actors,
 - Program tracking databases, and any implementation contractor monthly, quarterly and year end reports,
 - Potential market characterization sources (McGraw-Hill Construction Dodge Players Database, Building Stock Database, and the U.S. Census Bureau database, etc.)
- A key outcome from these discussions (meetings) with EDCs' evaluation and program staff will be refined version of program-specific logic models and the identification and prioritization of potential MCA evaluation activities

Formal secondary data sources review

- The purpose of this more extensive (formal) secondary data review will be to: (1) refine the program logic and prioritized key measurement indicators list to help guide the market assessment survey design and results evaluation phase, and (2) proceed with market characterization activities to describe and quantify the size and make-up of the market the program is working within including relevant market actors and for use as an aid in development the sample frame and final sample design for telephone surveys
- Documents that will be included in the formal secondary data sources review will include: (1) more thorough assessment of a comprehensive list of previous reports and studies prepared for EDC EE&C programs, and (2) detailed analysis of the McGraw-Hill Construction Dodge Players Database, Building Stock Database, and the U.S. Census Bureau database, etc.

Primary data collection via surveys and interviews with the appropriate market-actor groups

As specified in the RFP, these activities will include: survey design, survey implementation and survey data preparation. The GDS team's approach for completing each of these tasks is presented below:

- *Survey Design* – for this task, we will identify, develop, and implement strategies for the selection of appropriate samples (including specification of sample size, statistical power and expected precision). Table 11 presents initial thoughts regarding targeted market actors associated with types of major programs. These targets are extremely preliminary and will need to be refined based on actual EDC EE&C programs implemented and results from the secondary data research discussed earlier.

Table 11: Program Specific Market Assessment Target Market Actors

Program Name	Customers	Contractors/ Distributors	Other
ENERGY STAR Labeled Homes	- Participating recent homebuyers - Non-participating homebuyers	- Participating home builders - Former participating home builders - Non-participating home builders	N/A
Home Performance with ENERGY STAR	- Participating home owners - Partial participating home owners - Non-participating home owners	- Participating general and specialty contractors - Former participating general and specialty contractors Non-participating contractors	N/A
Energy Efficient Products	- Participating buyers - Participating retailers	- Participating store intercepts, mystery shoppers - Participating lighting contractors and trade allies	Manufacturers
C&I New Construction	- Participating new building owners - Non-participating new building owners	- Participating general and specialty contractors - Former participating general and specialty contractors Non-participating contractors	A&E firms
C&I Existing Facilities	- Participating building owners - Partial participating building owners - Non-participating building owners	- Participating general and specialty contractors - Former participating general and specialty contractors Non-participating contractors	Property managers

- All samples will be designed to achieve a statistical precision of 90 percent with a ± 10 percent confidence interval – subject to sufficient population availability. Where appropriate (i.e., for contractor groups), samples will be stratified to recognize differences in company size, number of jobs completed and geographic regions – in such cases sample sizes will need to be increased to achieve necessary statistical precision levels.
- As part of the survey design phase, data analysis plans will be developed for each program to be assessed, including researchable issues (testable hypotheses) that will be used to help guide survey instrument development. In addition, care will be taken to ensure sample selection and resulting surveys and data analyses are conducted in a manner that minimizes the potential for sample bias – including the development and use of appropriate weighting procedures.

The following researchable issues are presented as an example of the types of question areas to be included in program Market Assessment survey design:

- Awareness of the Program and Energy Efficiency Measures
- Satisfaction and Perceived Value

- Availability of Contractors and Energy Efficiency Equipment
- Project Profitability and Cost Allocations
- Measure Installation Practices and Barriers to Participation
- Changes in Energy Efficiency Practices and Program Influence
- Contractor Promotion, Training/Education, Quality Assurance, Advertising and Outreach

Ultimately, researchable issues and resulting survey questions will be developed from the Program Logic Model's prioritized list of measurement indicators and researchable issues and will be checked against previous data collection activities to ensure all survey efforts allow for the tracking of changes over time.

- Survey Implementation – Activities under this task will include:
 - Thoroughly pilot testing data collection instruments to refine and improve them. As a starting point, many directly relevant data collection instruments already exist and will for the basis for initial survey drafts (including previously completed instruments used for earlier EDC market assessment studies). Key members of the GDS Team have been involved in the design and delivery of many of these previous studies and have ready access to these publicly available data sources
 - All final data collection instruments will be administered either by experienced members of the GDS Team or by an experienced, high quality, low cost third party telephone survey firm that key members of the GDS team have worked with in the past. All quantitative surveys will be pre-programmed, pre-tested and implemented through a Computer Aided Telephone Interviewing (CATI) system from a trained/skilled telephone survey call center staff, using appropriate monitoring and verification protocols.
 - If approved by Commission staff, all quantitative data collected through our phone surveys will be compiled and transmitted to each EDC in an organized and readable format (absent any identification of confidential information – consistent with industry procedures and protocols). Where appropriate, data will be made available in SAS, SPSS, Excel and/or in MS Word WinCross table formats.
 - The GDS team will carry out any other associated survey data collection tasks as directed by the Authority, provide they are within the budget and time limitations approved for the project, or any mutually agreed upon modifications thereto.
 - Although we are recommending telephone surveys (with a majority of the questions being close-ended, to get maximum indicator coverage with minimum survey times and respondent burnout), as part of our program-specific evaluation implementation plans and prior to implementation, the GDS team will develop written documentation regarding the appropriateness of our proposed survey method (phone vs. mail or on-line). In addition, we will describe how the samples will be drawn (typically in a randomized manner), anticipated resulting statistical power, anticipated number of attempts prior to sample replacement, and we will provide an estimated cost for the complete survey implementation in a manner that ensures the highest quality of survey implementation and administration.
 - Throughout the survey implementation phase, weekly status reports will be provided regarding number of completes achieved to date and to identify any issues that might be arising.

- Survey Data Preparation – Activities under this task will include:
 - Preparation of a final report (per survey effort) including information on the sample acquisition process, screening and respondent selection, data collection instruments, timeframe of data collection, staff training, respondent outcomes, response and refusal rates, preliminary data analyses (including descriptive statistics and frequencies), sample disposition summaries, and other data collection information.
 - Similar to process evaluation data analysis, described earlier, the analysis for our telephone surveys has three steps:
 - The first is to analyze the quantitative survey results. We take a conservative statistical analysis approach, making sure that the data match, as well as possible, the statistics applied to it. While we have often found that the most straightforward statistics (i.e., frequencies, cross-tabulations) are the most powerful and understandable for many audiences, members of our team are highly capable of applying higher order statistics to data (i.e., analysis of variance and linear regression).
 - The second is to analyze the qualitative interview results. For qualitative data, the evaluation team may use a qualitative analysis tool to assist in coding and analyzing responses. This approach allows the researcher to carefully read and code responses while tracking larger themes that emerge across interviews and populations.
 - The third step will be to draw comparisons between the current results and results from previous program evaluations conducted in Pennsylvania. We may also take into consideration the results from other program evaluations recently completed on similar programs elsewhere in the state or comparative regions.
 - We will prepare detailed reports that present the research results in a way that is useful to program administrators, regulators, and the public to fully characterize the markets within which each program is working and will document the progress that these programs have had on the market actors and associated measurement indicators being targeted. Our reports will document our assumptions, list subjects for follow-on research, and make recommendations for improving the accuracy of program results and for modifying program operations to better align them with the EE&C overarching goals.

Task 2: Market Potential Study

Based on the finding of the Market Study and the EE&C program impacts to date, the GDS team will address the remaining energy and demand savings potential within the region. The MCA will be used to characterize the existing electric end-use baseline data on a customer class basis. This study will also provide information regarding total yearly sales of selected key energy efficiency equipment, saturation levels of this equipment by customer class, and useful lives of the equipment in order to characterize the current energy efficiency market. Based on these saturations and behavior established through the surveys, the GDS team will be able to conduct a potential study in order to determine the remaining savings potential and how it has evolved since the start of the EE&C programs. This will provide the data and evidence for determining future targets and deadlines. The final draft of this report will be submitted to the Director of CEEP by August 31, 2013.

Task 3: Energy Efficiency and Conservation Program Assessment Report

Based on the annual evaluation reports and the findings of the Market Study, the GDS team will address the cumulative EE&C program energy and demand savings to-date. The MCA will be used to characterize the current market and serve as a comparison to the original baselines at the start of the EE&C programs in order to determine market transformation patterns. This study will also provide an analysis of total energy and load reductions by customer class over the entire program period and of the total cost-effectiveness of the program as a whole. Leveraging the work done for the Market Potential Study, this report will also include an assessment of future energy and load reduction potential and target dates for achieving this potential. GDS will also provide recommendations for the funding levels required to achieve these results based on the remaining potential and feedback from satisfaction and market surveys over the previous years.

GDS will also include recommendations for program plans regarding implementation and evaluation based on findings and best practices. All of these findings and recommendations will be justified and accompanied by adequate factual supporting information. The final draft of this report will be submitted to the Commission by October 15, 2013. GDS understands that this final report must contain a provision in the preamble that states that “the findings, conclusions, and recommendations of the Statewide Evaluator’s report are the findings, conclusions, and recommendations of the Statewide Evaluator only, and, as such, are not necessarily agreed to by the EDCs or the Commission.” GDS also understands that the Commission may require GDS to act as an expert witness testifying on these findings and recommendations in any future rate case or other proceeding before the Commission or for proceedings in other venues.

Table 12: Phase III – Tasks, Deliverable and Dates:

Task:	Deliverables:	Dates:
1. Market Assessment Survey		To be completed by May 2013
2. Analyze Energy and Load Reduction Achieved by EDC EE&C Programs through May 2013		To be completed by May 2013
3. Analyze Overall Costs Incurred to Obtain Energy and Load Reductions by EDC EE&C Programs through May 2013		To be completed by June 2013
4. Analyze the Cost-Effectiveness of the EE&C Program as a Whole		To be completed by June 2013
5. Identify Best Practices		To be completed by June 2013
6. Suggests Improvements for Program as a Whole		To be completed by July 2013
7. Assess the Future Energy and Load Reduction Potential		To be completed by July 2013
8. Market Potential Report for Director of CEEP	● Report	August 31, 2013
9. Five-Year EE&C Program Report for the Commission	● Report	October 15, 2013

Phase III – Team and Work Hours:

The team assigned to this task will include the consultants listed in the table below. Richard Spellman, the President of GDS, will manage all aspects of Phase III. The anticipated time required by each team member for the tasks associated with PHASE III are outlined in the following table.

Table 13

Time Estimates for GDS Consultants by Task - Phase 3 (2013) - Revised June 16, 2009														
TASK #	TASK DESCRIPTION EXAMPLES	President	Vice President	Principal	Managing Director	Senior Project Manager	Project Manager	Project Engineer/ Project Consultant	Senior Engineer/ Analyst	Associate Engineer/ Analyst	Senior Engineering Assistant	Executive Assistant	Engineering Assistant	Total Labor Hours By Task
1	Market Assessment	44	50	52	52	147	312	384	453	151	227	227	272	2371
2	Market Potential Study	44	50	52	52	147	312	384	453	151	227	227	272	2371
3	Energy Efficiency and Conservation Program Assessment Report	38	43	45	45	126	267	329	389	130	194	194	233	2032
Total Consultant Hours:		127	142	149	149	420	890	1096	1295	432	648	648	777	6774

4.0 Experience and Capabilities

GDS Associates, Inc. is a multi-service engineering and management consulting firm, headquartered in Marietta Georgia, with offices in Indianapolis, Indiana; Auburn, Alabama; Austin, Texas; Manchester, New Hampshire; Madison, Wisconsin; Ashburn, Virginia; and Augusta Maine. Since its inception in 1986, GDS has enjoyed considerable growth and now employs a staff of over 170 persons. GDS is the prime contractor for this project and will be responsible for the overall management of this project. Subcontractors to GDS include Nexant, Clark Energy, Mondre Energy and All Facilities.

GDS has a broad array of management, strategic, and programmatic consulting expertise and specializes in energy, telecommunications, water and utility planning issues. The firm has completed numerous energy efficiency, renewable energy, and bio-energy projects for electric and natural gas utilities and state regulatory commissions. GDS has provided energy efficiency consulting services to public utility commissions in such states as Florida, Georgia, Hawaii, Maine, New Hampshire, North Carolina, Vermont, and Wisconsin.

The GDS consulting staff has extensive engineering, project management, and energy efficiency consulting experience. GDS principals and senior consultants are recognized leaders in the energy efficiency field, dedicated to their clients, and innovative in their approach to delivering quality energy efficiency consulting services that satisfy client needs.

Among the many consulting areas in which GDS has specialized skills are the following:

IRP and Energy Resource Planning Services	Securing adequate and reliable energy resources is crucial to thriving in a more competitive electrical market. GDS has helped guide its clients through uncharted territory by providing power supply portfolio, integrated resource planning, transmission planning, load forecasting, financial, wholesale and retail rate-making and competitive analysis services.
Generation Services	Greater competition has made effective control of power generation costs increasingly important. Over a span of more than 15 years, GDS has helped numerous power plant co-owners and non- utility generators reduce costs and achieve improved performance by identifying inefficiencies in power plant construction, operation and maintenance practices, and providing practical solutions.
Renewable Energy Resources, Distributed Generation, and CHP Services	GDS provides expertise in addressing the complex economic, engineering, scientific, and governmental issues associated with renewable and other distributed generation resources that impact utilities, government agencies, developers, and their customers.
Energy Efficiency and Demand Side Management Services	Our staff of highly qualified program design and analysis specialists assists clients with the complexities of multi-faceted energy efficiency planning, program implementation and evaluation. GDS has completed numerous energy efficiency and demand response technical and economic potential studies for our electric and natural gas utility clients.
Statistics and Market Research Services	GDS supplies wide-ranging statistical and market research services to electric and gas utilities and other clients. Our services stretch from proven survey design that captures demographic profiles of consumers and potential customers, to data mining and analysis of utility load information.
Environmental Management Services (GreenLine Environmental)	GreenLine Environmental, a GDS Company, provides environmental services to utilities, municipals, developers, industry, and the military. These services include right-of-way vegetation management, GPS and GIS mapping and inventory, environmental assessments, and urban forestry consulting.

Information Technology Services	A complete understanding of client business problems and needs is critical to the implementation of successful IT systems. GDS specializes in understanding these issues and combines this knowledge with select technologies to create cost-effective IT solutions.
Regulatory and Restructuring Services	GDS provides comprehensive regulatory and restructuring services to generators, transmitters, distributors, and large users of energy. Numerous state and federal restructuring initiatives have made regulatory planning and strategy development essential. To assist our clients with this task, GDS brings decades of expert regulatory experience in key areas such as rate design and litigation, contract negotiation, and transmission access.
Deregulation and Retail Energy Procurement Services	GDS provides a wide range of services to help clients plan for and benefit from participation in deregulated energy markets. These include, retail aggregation and energy procurement, merchant plant services, stranded cost analysis, and electric restructuring policy analysis.
Utility Privatization Services	GDS has successfully assisted clients throughout the country in their efforts to acquire the utility electric, gas, and water distribution systems.
Financial Analysis and Rate Services	The recent pace of regulatory change and uncertainty is unrivaled in the utility industry and requires equally unparalleled flexibility in ratemaking and regulatory strategies. GDS has been at the forefront of industry restructuring policy, offering broad expertise in regulatory accounting, economics, finance, and ratemaking.
Electric Distribution System Planning and Design Services (Hi-Line Engineering)	Hi-Line Engineering, a GDS company, offers electric distribution system planning, mapping, staking and design services to the electric utility industry throughout the United States. We provide high-quality, personal service to rural electric cooperatives, investor-owned utilities, municipals, and the U.S. military. GDS has managed the design and construction of thousands of miles of electric distribution lines across the US.
Water and Wastewater Utility Consulting Services	GDS provides expert assistance to water and wastewater utility management and users of water resources by addressing the complex engineering, accounting, economic, management, operational, regulatory, and policy issues that impact the water industry. GDS serves a variety of clients including municipalities, investor-owned utilities, water districts, non-profit customer-owned systems, and government agencies.
Natural Gas Consulting Services	GDS provides creative solutions to help our clients meet challenges arising in both regulated and competitive environments within the evolving natural gas utility industry. Our team of highly qualified professionals works to address complex economic, engineering, policy, and regulatory issues with clients including consumer groups, publicly owned utilities and regulatory authorities.

GDS has provided integrated resource planning, energy efficiency and demand-side management services to the following clients:

- ⊙ Adams Columbia Electric Cooperative
- ⊙ Alliance to Save Energy
- ⊙ Alliant Corporate Services
- ⊙ Arkansas Electric Cooperative Corporation
- ⊙ Aspen Systems Corporation
- ⊙ Bay State Gas Company
- ⊙ Berkshire Gas Company
- ⊙ Big Rivers Electric Cooperative
- ⊙ Biomass Gas and Electric
- ⊙ British Columbia Hydro (BC Hydro)
- ⊙ Blackstone Valley Electric Company
- ⊙ Boston Gas Company (now KeySpan Energy Delivery)
- ⊙ Bonneville Power Administration (BPA)
- ⊙ Boston Edison (now NSTAR)
- ⊙ Brazos Electric Cooperative
- ⊙ Cadmus Group
- ⊙ Cambridge Electric Light (now NSTAR)
- ⊙ Central Electric Power Cooperative
- ⊙ Central Maine Power Company
- ⊙ City of Gainesville, Florida
- ⊙ City of Grand Island, Nebraska
- ⊙ City of Houston, Texas

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- ③ City of Lafayette, Louisiana
 - ③ Cobb Electric Membership Cooperative
 - ③ Colonial Gas Company
 - ③ Commonwealth Electric (now NSTAR)
 - ③ COM/Gas (now NSTAR)
 - ③ Consolidated Edison of New York
 - ③ Connecticut Conference of Municipalities
 - ③ Connecticut Energy Advisory Board (CEAB)
 - ③ Connecticut Energy Conservation Management Board (ECMB)
 - ③ Connecticut Light and Power Company
 - ③ Consortium for Energy Efficiency
 - ③ Dairyland Power Cooperative
 - ③ East Texas Electric Cooperative
 - ③ Eastern Edison
 - ③ Efficiency Maine
 - ③ Electric Council of New England
 - ③ Enbridge Consumers Gas (Canada)
 - ③ Energy North
 - ③ Energy Options
 - ③ Fall River Gas Company
 - ③ Fitchburg Gas and Electric Company
 - ③ Florida Public Service Commission
 - ③ Gainesville, Florida Regional Utilities (GRU)
 - ③ GasNetworks (Massachusetts)
 - ③ Georgia Environmental Facilities Authority
 - ③ Georgia Public Service Commission
 - ③ Granite State Electric Company
 - ③ Hawaii Department of Business, Economic Development and Tourism
 - ③ Hawaii Public Utilities Commission
 - ③ H.E. Butt Grocery Store Chain
 - ③ Holy Cross Energy
 - ③ Hoosier Energy
 - ③ KeySpan Energy Delivery
 - ③ La Capra Associates
 - ③ Maine Public Service Company
 - ③ Maine Public Utilities Commission
 - ③ National Grid
 - ③ Massachusetts Health and Educational Facilities Association
 - ③ Megdal and Associates
 - ③ Milwaukee School of Engineering
 - ③ Nantucket Electric Company
 - ③ Narragansett Electric Company
 - ③ National Grid, USA
 - ③ NSTAR
 - ③ New England Gas Company
 - ③ Newport Electric
 - ③ New Hampshire Electric Cooperative
 - ③ New Hampshire Governors' Office of Energy and Community Service
 - ③ New Hampshire Public Utilities Commission
 - ③ North Carolina Electric Membership Cooperative
 - ③ North Carolina Utilities Commission
 - ③ Northeast Texas Electric Cooperative
 - ③ Northeast Utilities Service Company (NUSCO)
 - ③ Northern States Power
 - ③ Northern Utilities
 - ③ NYSERDA
 - ③ Public Service Company of New Hampshire
 - ③ Public Service of New Mexico
 - ③ Questar Gas Company
 - ③ Sam Rayburn G&T Electric Cooperative
 - ③ Santee Cooper
 - ③ Sharyland Utilities
 - ③ Southern Alliance for Clean Energy
 - ③ Southern Connecticut Gas Company
 - ③ Shel Feldman Management Consulting
 - ③ State of Virginia Energy Office
 - ③ State of Wisconsin, Department of Administration
 - ③ State of Wisconsin, Public Utility Commission
 - ③ TecMarket Works
 - ③ Tennessee Valley Authority (TVA)
 - ③ Tex-La Electric Cooperative
 - ③ Utah Energy Office
 - ③ Union Gas (Canada)
 - ③ United Illuminating
 - ③ Unifil
 - ③ Vermont Department of Public Service
 - ③ WE Energies (Wisconsin)
 - ③ Western Massachusetts Electric Company
 - ③ Wisconsin Focus on Energy
 - ③ Xcel Energy

4.1 Overview of Evaluation Experience and Capabilities of GDS Associates, Inc.

GDS experts understand the quantitative and qualitative issues associated with the design, implementation, and evaluation of successful energy efficiency plans and programs. We use our technical expertise to minimize financial risks and maximize the benefits from energy efficiency programs and policies for our clients. A small sample of our program evaluation services includes:

- Development of energy efficiency and demand response potential studies
- Development of program evaluation plans and budgets
- Impact evaluations
- Process evaluations
- Program logic model development
- Cost effectiveness model development (energy efficiency, renewables/distributed generation)
- Measure, program, and portfolio-level benefit cost analysis
- Development of data tracking and reporting systems for program evaluations
- Formal programs evaluation filings with regulatory commissions
- Expert testimony

This section presents detailed information on our qualifications and experience for program evaluation, measurement and verification. The table below provides examples of program evaluation projects GDS has completed for clients. Additional detailed project descriptions and client contact information are presented in Appendix B of our proposal.

GDS Qualifications for Program Evaluation, Measurement and Verification

Client Name	Project Name	Project Description	Date of Project
Impact Evaluations			
New York State Energy Research and Development Authority (NYSERDA)	New York Energy Research and Development Authority (NYSERDA) - Energy Smart Program B/C Analysis	GDS provided impact evaluation services as part of a broader contract with NYSERDA. GDS was hired to assist with cost-effectiveness analyses on all quantifiable energy efficiency and renewable resource programs being delivered through their New York Energy Smart portfolio of programs.	2007 to December 2009
New Hampshire's Home Energy Assistance Program	Impact Evaluation of New Hampshire's Home Energy Assistance Program	GDS was hired to conduct an impact evaluation of New Hampshire Electric Utilities' Home Energy Assistance Program that serves income-eligible residential customers throughout New Hampshire. GDS' role involved a statistical billing analysis of all program participants; a comprehensive engineering review of energy savings estimates and associated methodologies and software. GDS also conducted on-site assessments of a sampling of participants	June 2005 to December 2005
Long Island Power Authority (LIPA)	Impact Evaluation of LIPA's Clean Energy Initiative REAP Program - Low Income Program Evaluation	GDS was retained (as a subcontractor to Medgal & Associates) to complete a statistical bill analysis of the energy savings in LIPA's residential low-income energy efficiency program. GDS prepared all of the data for inclusion in the analysis and conducted all regressions necessary to draw conclusions.	June 2001 to June 2003
KeySpan Energy Delivery	Benefit/Cost Analysis of KeySpan Energy Delivery Low Income Energy Efficiency Program	GDS was retained to complete a detailed engineering analysis of the electric and natural gas energy savings in KeySpan Energy Delivery's residential low-income energy efficiency program.	2004
KeySpan Energy Delivery	Impact Analysis of KeySpan Residential Weatherization Program	GDS was retained to complete a statistical billing analysis of the electric and natural gas energy savings in KeySpan Energy Delivery's residential weatherization and insulation program	August to October 2003
Northeast Energy Efficiency Partnerships (NEEP)	Evaluation of Northeast Energy Efficiency Partnership's (NEEP) Building Operator Certification Program	GDS was subcontracted as part of an evaluation team to perform a process, market and impact evaluation of NEEP's Building Operator Certification (BOC) program. Key elements of GDS' role in this evaluation included: database and document review; survey instrument design; sample selection; and savings impact analysis	January 2002 to July 2002
Northeast Utilities	Impact Evaluation of Municipal Buildings Program	GDS was hired by Northeast Utilities to perform an impact evaluation of its 2000 Municipal Buildings program. Key elements of this evaluation included: sample design; on-site monitoring and verification of installed measures; verification of tracking system accuracy; engineering review of savings algorithms; impact evaluation; customer surveys; and assessment of impact issues.	January 2002 to July 2002
NSTAR	Residential High Use Energy Efficiency Program	GDS was hired (as a subcontractor to Medgal & Associates) to perform an impact evaluation of its 1999 Residential High Use energy efficiency program. Key elements of this impact evaluation included: database assessment; engineering review; statistical billing analysis impact evaluation; customer surveys, site visits; and assessment of impact process issues.	1999
East Texas Electric Cooperative (ETEC)		GDS completed a detailed impact evaluation of the peak demand savings of the residential air conditioning and electric water heating cycling program of the ETEC. GDS performed all tasks on this evaluation, including development of the research approach, design of survey instruments, development of sampling plans, end use metering, data analysis and report writing.	1997 to 1998

Client Name	Project Name	Project Description	Date of Project
Measurement and Verification			
New York State Energy Research and Development Authority (NYSERDA)	Large Impact Savers Program	GDS conducted measurement of verification work of Georgia-Pacific and Rockland County Sewer Technical Assistance reports and any resulting projects.	2008
Efficiency Vermont (EVT) and Burlington Electric Department (BED)	Energy Efficiency Measurement and Verification: Electric Demand Metering Analysis to Assess Impacts for Forward Capacity Market Participation	GDS is under contract (as a subcontractor to West Hill Energy) for a two-year project. The goal is to verify that EVT and BED winter and summer kW reductions meet the New England ISO standards established for the Forward Capacity Market (FCM). This project involves pre and post inspection sampling for 80 energy efficiency projects.	current
West Hill Energy and Computing, Inc.	Energy Savings Verification and Engineering Review Service to the Vermont Department of Public Service Energy Efficiency Division	As a subcontractor to West Hill Energy, GDS assisted the Vermont Department of Public Service with the verification of EVT savings and the ongoing review of prescriptive and non-prescriptive custom commercial projects. This involves a thorough review of the program files and analytical tools used to estimate savings as well as discussions with EVT program staff to address outstanding issues and fill in missing information.	March 2004 to December 2008
Energy Conservation Management Board (ECMB); United Illuminating Company (UI) and Connecticut Power and Light (CL&P); Cape Light Compact, NSTAR; National Grid; Unifit; Efficiency Vermont	Energy Efficiency Maximum Achievable Potential Study	As subcontractor, GDS was assigned to: on-site surveys and data collection, including installing time-of-use lighting loggers and analyzing metered data to assess energy savings during a full year as well as summer and winter demand savings coincident with the ISO period.	March 2003 to June 2004
New England State Program Working Group	Common Measurement and Verification Standards Development for Energy Efficiency Measures/Programs for the ISO-NE Forward Capacity Market	GDS was a lead contractor hired to assist the New England State Program Working Group to develop consistent and/or common regional measurement and verification protocols for energy efficiency resources to be used as input to the development of M&V Standards for the ISO-NE Forward Capacity Market Measurement and Verification Manual. Key tasks included: development of common M&V methods, development of common values/consistent approaches for measuring peak demand reduction values, and development of default measure life values for select residential and commercial/industrial energy efficiency measures.	2006 to 2007
Maine Public Utilities Commission	Efficiency Maine Residential and Business Programs	GDS developed the Technical Reference Manual for Efficiency Maine's energy efficiency programs. GDS is now responsible for updating this manual on an on-going basis.	2007
Ameren Illinois	Design and Implementation of Ameren Illinois ActOnEnergy Business Program	GDS Associates is part of a team that has been designing and implementing state-wide energy efficiency programs for the commercial, agriculture, and industrial sectors in Ameren Illinois service territory. GDS is providing technical services to businesses facilities in Illinois relating to the economic feasibility and energy savings of energy efficiency measures. GDS provides program design, on-the-ground program implementation, data tracking, call center and administrative support for the various programs.	May 2008 to present
ISO-New England	ISO-NE Forward Capacity Market Qualification Package Review Support	GDS conducted a review of Demand Resource qualification packages for completeness and compliance with the Market Rules and the ISO-New England Manuals for ISO-New England.	June 2007 to September 2007
British Columbia Hydro	Assessment of British Columbia Hydro Ten-Year Energy Efficiency Plan	GDS conducted a comprehensive assessment of the appropriateness and reasonableness of the proposed program plans, processes, and procedures included in the BC Hydro DSM Ten-Year Plan. GDS reviewed program implementation and evaluation plans, marketing strategies, benefit/cost analyses, monitoring and verification protocols, staffing plans, program budgets and financial and energy savings reporting systems and made recommendations on items needing improvement.	February 2002 to May 2002
National Grid	Technical Assistance Services for National Grid	GDS provided technical assistance to support the implementation program and evaluation of energy efficiency projects. Services include field measurement, review and independent verification of energy efficiency measure recommendations and associated savings estimates for multiple commercial and industrial facility projects being implemented throughout National Grid's service territory.	June 2006 to May 2007
New Hampshire Business Resource Center	New Hampshire Business Resource Center – Industrial Energy Audits	GDS is to provide technical assistance to its business clients to carry out comprehensive energy audits, provide recommendations for energy conservation opportunities, evaluate existing technologies, provide consultation and professional evaluations of emerging technologies for renewable and alternative energy sources and bio energy products, and to assist with the USDA energy efficiency grant applications.	May 2007 to 2009
Wisconsin Focus on Energy Business Program	Design and Implementation of Wisconsin Focus on Energy Business Program	GDS has been designing and implementing state-wide energy efficiency programs for the commercial, production agriculture, and industrial (biofuels) sectors in Wisconsin since 1999 for the Focus on Energy Program. Since 2001, GDS has provided the Wisconsin Focus on Energy Program with technical services to businesses and production agriculture facilities in Wisconsin relating to the economic feasibility and energy savings of energy efficiency measures. GDS provides program design, on-the-ground program implementation, marketing, incentive processing, energy audits, and administrative support for the various programs.	1999 to present

Impact Evaluation Qualifications

GDS has solid experience evaluating program energy and peak demand savings and cost-effectiveness of energy efficiency measures/programs and demand response programs. From 2007 to December 2009, GDS provided impact evaluation services as part of a broader contract with the New York State Energy Research and Development Authority (NYSERDA). GDS was hired to assist with cost-effectiveness analyses on all quantifiable energy efficiency and renewable resource programs being delivered through their New York Energy \$martSM portfolio of programs.

From June 2005 to December 2005 GDS completed an impact evaluation of New Hampshire's Home Energy Assistance Program. GDS was hired to conduct an impact evaluation of New Hampshire Electric Utilities' Home Energy Assistance Program that serves income-eligible residential customers throughout New Hampshire. GDS' role involved a statistical billing analysis of all program participants, a comprehensive engineering review of energy savings estimates and associated methodologies and software. GDS also conducted on-site assessments of a sampling of participants.

GDS was retained (as a subcontractor to Megdal & Associates) to complete a statistical billing analysis of the energy savings in LIPA's residential low-income energy efficiency program. GDS prepared all of the data for inclusion in the analysis and conducted all regressions necessary to draw conclusions. In 2004 GDS was retained to complete a detailed engineering analysis of the electric and natural gas energy savings in KeySpan Energy delivery's residential low income energy efficiency program. In 2003 GDS was also retained to complete a statistical billing analysis of the electric and natural gas energy savings in KeySpan Energy Delivery's residential weatherization and insulation program.

In 2002, GDS was subcontracted as part of an evaluation team to perform a process, market, and impact evaluation of NEEP's Building Operator Certification (BOC) program. Key elements of GDS' role in this evaluation included: database and document review; survey instrument design; sample selection; and savings impact analysis.

In 2003 GDS was hired by Northeast Utilities to perform an impact evaluation of its 2000 Municipal Buildings program. Key elements of this evaluation included: sample design; on-site monitoring and verification of installed measures; verification of tracking system accuracy; engineering review of savings algorithms; impact evaluation; customer surveys; and assessment of impact issues. Results from the analysis were used to reconcile actual program results under Connecticut and Massachusetts regulatory reporting requirements. In addition, results were used to modify initial energy savings estimates for Northeast Utilities' municipal sector energy efficiency programs. A copy of this impact evaluation is provided in Appendix D of our proposal.

In 1999, GDS was hired (as a subcontractor to Megdal & Associates) by NSTAR to perform an impact evaluation of its 1999 Residential High Use energy efficiency program. Key elements of this impact evaluation included: database assessment; engineering review; statistical billing analysis impact evaluation; customer surveys, site visits; and assessment of impact and process issues. Results from the analysis were used to reconcile actual program results with Massachusetts DTE-approved performance incentive metrics as well as for use as the basis for other regulatory reporting requirements. In addition, results were used to modify initial energy savings estimates for the Company's future energy efficiency programs. As part of this contract, GDS was responsible for performing an engineering review of NSTAR's program as well as conducting on-site inspections of work performed as part of the program.

The engineering review was conducted as a process of understanding, documenting, and comparing the available gross savings estimates of measure savings from the NSTAR tracking system to documented savings estimates for similar efforts. The primary elements included in the review were:

- Algorithms used by the implementation contractors and NSTAR;
- Tracking system information;
- Comparison with algorithms in similar efforts;
- Documented and measured savings from similar efforts; and,
- Input from the participant telephone survey on usage and occupant characteristics into the NSTAR algorithms.

The site visits were conducted to fulfill three primary purposes: 1) to examine and verify quality of installation; 2) to check and assess potential lost opportunities (measures that would have been cost-effective had they been identified and implemented); and 3) to investigate customers with anomalous billing data as found through a billing analysis.

In 1997 and 1998, GDS completed a detailed impact evaluation of the peak demand savings of the residential air conditioning and electric water heating cycling programs of the East Texas Electric Cooperative (ETEC). GDS performed all tasks on this evaluation, including development of the research approach, design of survey instruments, development of sampling plans, end use metering, data analysis and report writing.

Measurement and Verification Qualifications

GDS has gained extensive experience in Performance Measurement and Verification in both prescriptive and non-prescriptive programs for numerous utilities and public service organizations across the United States and Canada. Some of GDS' most recent M & V work demonstrates our company's capacity to apply our expertise to prescriptive and non-prescriptive programs.

GDS provided consulting services to NYSERDA's Large Impact Savers program in 2008. GDS conducted Measurement and Verification work of Georgia-Pacific and Rockland County Sewer Technical Assistance reports and any resulting projects.

Currently GDS is under contract (as a subcontractor to West Hill Energy) for a two-year project entitled "Energy Efficiency Measurement and Verification: Electric Demand Metering and Analysis to Assess Impacts for Forward Capacity Market Participation" which has the goal to verify that Efficiency Vermont (EVT) and Burlington Electric Department (BED) winter and summer kW reductions meet the New England ISO standards established for the Forward Capacity Market (FCM). This project involves pre and post inspection sampling for 80 energy efficiency projects.

In 2008, GDS assisted the Vermont Department of Public Service (as a subcontractor to West Hill Energy) with the verification of Efficiency Vermont's (EVT) savings and the ongoing review of prescriptive and non-prescriptive savings. GDS' focus is primarily on verifying the energy and demand savings associated with non-prescriptive custom commercial projects. This involves a thorough review of program files and analytical tools used to estimate savings as well as discussions with EVT program staff to address outstanding issues and fill in missing information.

GDS also conducted the evaluation of residential retail lighting product promotions in Connecticut, Massachusetts, Rhode Island, and Vermont. The evaluation was conducted for the Energy Conservation Management Board (ECMB) as well as the United Illuminating

Company (UI) and Connecticut Power and Light (CL&P) in Connecticut; the Cape Light Compact, NSTAR, National Grid, and Unitil in Massachusetts; National Grid in Rhode Island; and Efficiency Vermont in Vermont. The evaluation was conducted by a team led by Nexus Market Research, Inc. (NMR) with RLW, Inc. (RLW), and GDS Associates (GDS) serving as subcontractors. Project tasks assigned to GDS included: on-site surveys and data collection, including installing time-of-use lighting loggers and analyzing metered data to assess energy savings during a full year as well as summer and winter demand savings coincident with the ISO period.

GDS Consultants are familiar with International Performance Measurement & Verification Protocol (IPMVP). GDS' project consultants Amber Roberts and Joe Danes are accredited as Certified Measurement and Verification Professionals and along with other GDS staff holds a strong working knowledge of the IPMVP guidelines. GDS has solid experience in developing and reviewing M & V protocols/plans, the development of Technical Reference Manuals for major efficiency programs and a thorough understanding of deemed savings methodology. GDS consultants and staff have a strong working knowledge and familiarity with the California DEER and NYSERDA Deemed Savings Database tools, as well as the Efficiency Maine Technical Reference Manual and the State of Connecticut Program Savings Document.

In 2006-2007, GDS was a lead contractor hired to assist the New England State Program Working Group to develop consistent and/or common regional measurement and verification (M&V) protocols for energy efficiency resources to be used as input to the development of M&V Standards for the ISO-NE Forward Capacity Market Measurement and Verification Manual. Key Tasks included: development of common M&V methods, development of common values/consistent approaches for measuring peak demand reduction values, and development of default measure life values for select residential and commercial/industrial energy efficiency measures. A final report was published by GDS in the summer of 2007.

In 2007, GDS developed the Technical Reference Manual for Efficiency Maine's energy efficiency programs. This detailed manual provides documentation for the costs, energy savings and useful lives of all energy efficiency measures offered in Efficiency Maine programs. GDS is now responsible for updating this manual on an on-going basis.

In 2008, GDS developed the Technical Reference Manual for Ameren Illinois' energy efficiency programs.

In 2007, GDS conducted a review of Demand Resource qualification packages for completeness and compliance with the Market Rules and the ISO-New England Manuals for ISO-New England. Each qualification package reviewed included assessment of the following items: Project description; Source of funding; Measurement and Verification Plan; Customer acquisition plan (including the resource's critical path schedule); and Capacity Commitment Period election.

BC Hydro retained GDS in February 2002 to conduct a comprehensive assessment of the appropriateness and reasonableness of the proposed program plans, processes, and procedures included in the BC Hydro DSM Ten-Year Plan. BC Hydro's plan called for spending CAD \$600 million over ten years to achieve annual savings of 3,500 GWh and over 400 MW of capacity by the year 2012. GDS reviewed program implementation and evaluation plans, marketing strategies, benefit/cost analyses, monitoring and verification protocols, staffing plans, program budgets and financial and energy savings reporting systems and made recommendations on items needing improvement.

In May 2003, BC Hydro retained GDS to update the 2002 study done by GDS that examined the appropriateness and reasonableness of the proposed program plans, processes, and procedures included in the BC Hydro DSM Ten-Year Plan. GDS reviewed BC Hydro's compliance with recommendations made in its 2002 audit report and examined BC Hydro's latest benefit/cost analyses for the PowerSmart Ten Year Plan. An updated report with findings and recommendations was submitted to BC Hydro senior management in late June 2003.

In 2006-2007, GDS provided technical assistance to National Grid to support the implementation and evaluation of energy efficiency projects. Services include field measurement, review and independent verification of energy efficiency measure recommendations and associated savings estimates for multiple commercial and industrial facility projects being implemented throughout National Grid's service territory.

From 2007 through 2009, the New Hampshire Business Resource Center has retained GDS to provide technical assistance for its business clients to carry out comprehensive energy audits, provide recommendations for energy conservation opportunities, evaluate existing technologies, provide consultation and professional evaluations of emerging technologies for renewable and alternative energy sources and bio energy products, and to assist with USDA energy efficiency grant applications.

GDS has been designing and implementing state-wide energy efficiency programs for the commercial, production agriculture, and industrial (biofuels) sectors in Wisconsin since 1999 for the Focus on Energy Program. Since 2001, GDS has provided the Wisconsin Focus on Energy Business Program with technical services to businesses and production agriculture facilities in Wisconsin relating to the economic feasibility and energy savings of energy efficiency measures. GDS provides program design, on-the-ground program implementation, marketing, incentive processing, energy audits, and administrative support for the various programs.

Quality Assurance /Quality Control Qualifications

Between March 2004 and June 2007, GDS was part of a five-organization (Aspen Systems, GDS Associates, LK Goldfarb Associates, Vreeland, APT) team that designed and implemented the MPUC's Efficiency Maine Residential Lighting Program. In April and May of 2004, GDS completed a series of four focus groups with non-participants in this program to learn more about market barriers that prevent homeowners from installing energy efficient lighting in their homes in Maine. The final focus group report for this project was completed in May 2004. GDS developed a Quality Assurance Plan for all data collection and analysis for this program.

From May 2004 to December 2006, GDS was hired by PSNH to assist in delivering targeted engineering services to commercial and industrial (C&I) customers in conjunction with PSNH's energy efficiency programs. The range of technical assistance includes conducting scoping studies, focused feasibility studies, comprehensive facility services and whole building assessments. In addition, GDS provides quality assurance services, energy efficient project implementation assistance, and additional technical assistance and engineering services as needed.

In 2003, GDS led the design and implementation of a process, awareness, and quality verification assessment of Fitchburg Gas and Electric Light Company's ongoing Small C&I and Low-Income energy efficiency programs. Key project deliverables for process work included: performance and completion of secondary program and database research; draft and final interview guides for depth interviews with program design and implementation staff; summary of

program design including results from depth interviews and flow diagram showing program logic and key delivery mechanisms. For awareness work, deliverables included: draft and final telephone survey guides and completed assessment of participation and customer satisfaction. Quality control deliverables included: draft and final site-visit survey guides and write-up of methodology and results/findings from on-site inspections.

GDS has extensive experience developing pre- and post- inspection statistical sampling in accordance with IMPVP protocols, additional to the aforementioned project involving verification of Efficiency Vermont's estimated energy savings for 80 projects.

Qualifications for Market Assessment and Baseline Studies

In 2008 GDS completed a detailed market assessment and baseline study for Efficiency Maine for the residential new construction market. In 2007 GDS completed a detailed market assessment and baseline study for the Maine residential lighting market for Efficiency Maine.

In May 2007 to May 2009 GDS was retained by NYSERDA to assist their in-house program evaluation staff in the following areas: (1) characterizing markets, (2) developing market studies to attribute effects to NYSERDA's programs, (3) collecting market information as it affects customer response to programs, (4) tracking market progress indicators and (5) developing logic models and design matrices.

The Massachusetts JMC retained GDS in 2005 to conduct 90 on-site inspections of newly constructed homes in Massachusetts for the purposes of collecting energy efficiency characteristics of new homes. This information has been used to adjust the definition of the user defined reference home which is instrumental to the delivery of the Massachusetts ENERGY STAR Home Program.

GDS was responsible for providing data collection, analysis, and report writing services to NYSERDA in support of their overall evaluation efforts for the first 3 years of the New York Energy \$martSM program effort. The GDS team continued to help NYSERDA for the period July 2001 through May 2003 in a number of critical evaluation areas associated with their portfolio of over 35 separate energy efficiency, renewable resource and research & development programs including: design and performance of key process and impact evaluations, market characterization and baseline assessments; program-specific survey instrument review and modifications; savings methodology reviews; measure, program, and portfolio-level benefit-cost model design and analysis; coincident peak demand reduction assessments; data needs identification and collection support; program progress and initial causality assessment; other data analysis and annual program status and evaluation report development support.

Between 2000-2003 GDS conducted work for the Vermont Department of Public Service (DPS), evaluating a statewide portfolio of energy efficiency programs targeted to the Commercial and Industrial market sectors. A detailed market characterization and baseline assessment report was developed as a key deliverable for this project and included recommendations (and baseline values) for a number of key indicators for tracking continued program success. Other tasks in this project included: secondary research on C&I program activities and regulations in VT; and market characterization and assessment interviews.

GDS subsidiary was retained by the Massachusetts Gas DSM Collaborative (Bay State Gas, Berkshire Gas, Boston Gas, Colonial Gas, COM/Gas, Essex Gas, Fall River Gas) to develop market assessment and baseline characteristics for four market transformation programs in the Boston Gas service area. For this project, GDS conducted site surveys, a mail survey of

purchasers of new homes and gas heating equipment, depth interviews by phone with market actors, and conducted content analysis of newspaper and business to business publications. GDS created over 270 indicators of market transformation for the four programs and has completed baseline and Year 2 measurements. GDS was the prime contractor, managed a large research budget, and managed a team of several subcontractors, including Aspen Systems, B&B Resources, Burrelles, CMP International, Data Star, ERS, Shel Feldman Management Consulting, and Megdal & Associates. This was a large project having multiple tasks and multiple subcontractors, covering residential and commercial market segments.

In 1999-2000 GDS was hired by Public Service of New Hampshire, Granite State Electric Company, and the ECS to conduct a baseline study on commercial construction practices to assist in determining whether New Hampshire's current commercial energy code is ripe for upgrading to promote more up-to-date practices. Services performed included: developing a profile of the concentrations of commercial and industrial construction activity in the State by location and building type; reviewing plans and prints to determine baseline standards for specification; inspecting a subset of buildings to determine what is actually being constructed and what equipment is actually being installed; interviewing equipment suppliers to assess standard efficiencies of measures being purchased for installation; reviewing existing baseline studies; synthesizing results into a series of bulleted tentative findings about standard commercial design and construction practices in New Hampshire; testing these finding in round table discussion groups; interviewing building officials in jurisdictions where new construction is most active; and producing a final report.

In 1998-1999 GDS was retained by the Massachusetts Electric Company and eight other electric utilities to develop market assessment and baseline characteristics for the residential new construction market in southern New England. Primary research tools were a mail survey, site surveys of new homes, in depth market research interviews by phone, and content analyses. One sub element of this project was the development of a Market Progress Report, completed in June, 1999.

Process Evaluation Qualifications

As part of a larger contract with Fitchburg Gas and Electric in Massachusetts, GDS led the design and implementation of a process, awareness, and quality verification assessment of the Company's ongoing Small Commercial and Industrial and low income electric energy efficiency program.

In 2002, GDS was retained to perform a process, market, and impact evaluation of NEEP's Building Operator Certification (BOC) program. Key elements of GDS' role in this evaluation included: database and document review; survey instrument design; sample selection; and savings impact analysis.

In April to July 2007, GDS was retained by the Bonneville Power Administration to conduct an assessment of their Non-Wires Solutions initiative development process and the current state of the initiative. The BPA Non Wires Solutions Program assesses the feasibility of energy efficiency and demand response programs as an alternative to building new electric transmission lines in the BPA service area. GDS reviewed program materials and reports, designed an interview guide and conducted in-depth, interviews with key BPA staff. Our analysis identified program strengths, weaknesses and potential improvements in key program areas including design, implementation, planning, cost impact & allocation and resources. A final report was delivered on June 8, 2007. A copy of this process evaluation is provided in Appendix D of our proposal.

From July through September 2003, GDS was retained to evaluate an ongoing pilot program being offered by New Hampshire Electric Cooperative to residential lighting, residential weatherization (electric and non-electric heat), and small business members and PSNH municipal customers. This pilot is testing key concepts associated with a new Pay-As-You-Save approach where energy consumers can install energy efficiency measures with no up front costs and pay back the installation and measure costs through a separate charge added to their monthly electric bill, based on a portion of the estimated energy savings they will be recognizing over a portion of the life of their new efficient measures. Work tasks included: review of over 20 PAYS-related documents, 10 depth interviews with utility staff and PAYS program vendors, 93 telephone surveys with participants, rejectors and non-participants, and 2 focus groups with NHEC non-participants, data analysis, report drafting and presentation of results. All work was performed over an accelerated 5 week time period.

GDS was hired (as a subcontractor to Megdal & Associates) by NSTAR to perform process evaluations on their electric distribution company subsidiaries' Low Income Single-Family, Low Income Multi-Family, and Low Income New Construction programs. In addition, an implementation analysis was conducted for NSTAR's Low Income Single Family program. GDS's responsibilities in this project included: survey instrument development, database review, process and implementation evaluation analysis and report writing.

Qualifications for Market Effects Studies

Between 1998 and 1999, GDS was hired by Boston Edison Company to estimate the future market penetration and market effects of energy efficient residential clothes washers and commercial/industrial/institutional premium efficient motor installations using a Delphi survey technique. Primary activities included: identification and recruitment of 8 expert panelists for each technology; development of base case technology descriptions, moderate and aggressive intervention scenarios for each technology; design of survey questionnaires; implementation and compilation of survey results; and final report preparation.

In the fall of 1997 GDS was hired by Boston Gas Company to develop market assessment plans for the Company's new market transformation programs, to develop an overall evaluation plan for these programs, and to develop rigorous indicators of market effects. This work was completed in the fall of 1997. GDS was the prime contractor. Boston Gas Company then retained GDS to track and report on these indicators in 1998, 1999, and 2000. GDS completed this work and reported results to the Company in a series of technical reports, and presented the results at the ACEEE summer Study on Building Energy Efficiency.

Qualifications for Avoided Emissions Calculations

GDS has calculated, tracked and reported the reduced power plant emissions (SOX, NOX, CO2, and particulates) for the energy efficiency programs of Efficiency Maine, Wisconsin Focus on Energy and for other GDS clients. Our work in this area has included calculating the electricity savings for energy efficiency programs and determining the proper conversion factors to use for emissions reductions for SOX, NOX, CO2 and particulates. For a sample of the work GDS has completed on avoided emissions calculations, see the annual report for the Efficiency Maine programs located on the Efficiency Maine web site (www.energymaine.com).

GDS Energy Efficiency Program Implementation Experience

GDS Associates, Inc. (GDS) has significant experience and qualifications relating to energy efficiency program design, implementation, and evaluation. GDS provides focused oversight and implementation assistance on a variety of energy efficiency program outreach and market

intervention efforts for commercial, industrial, agricultural, institutional, residential, and low-income customers. Services include: (1) direct implementation and oversight of pilot programs to help test the validity of, and improve initial targeted program designs and statewide delivery of market or sector-focused energy efficiency program intervention efforts; (2) implementation of full-scale programs (including residential, commercial, industrial, agricultural, municipal and institutional energy audits and efficiency, demand response opportunities and renewable/distributed generation assessments); and (3) design and development of high quality and targeted marketing plans and marketing materials.

Over the past seven years GDS has provided energy efficiency program implementation services to such organizations as Efficiency Maine, Wisconsin Focus on Energy, the Energy Star Homes Program in Massachusetts and New Hampshire, and Ameren Illinois, a major investor-owned utility in Illinois. By utilizing the lessons learned, these experiences have provided us with the insights needed to develop and implement successful process and impact evaluation programs.

GDS consultants have covered many aspects of program implementation for Efficiency Maine, including program design, technical support to program participants and program allies, data tracking and reporting, market assessment and baseline studies, program benefit/cost analyses, development measure screening and measure characterization, and technical support to MPUC staff on ISO-New England forward capacity market issues. Some of our specific capabilities and expertise areas can be found in the following paragraphs. Additional information on GDS's program implementation qualifications are presented in the list of related energy efficiency projects provided with in our response to this RFQ.

Efficiency Maine Residential Lighting Program

GDS has been responsible for completing a number of implementation activities for the Residential Lighting Program including market assessment and baseline surveys, market progress reports, tracking and reporting of program kWh and kW savings and emissions reductions, annual calculations of the Maine Societal benefit/cost ratio for the program, and benefit/cost analyses for energy efficiency measures. Listed below are descriptions of some of the research and other program planning and implementation activities completed by GDS for the Efficiency Maine Residential Lighting Program.

- **Residential lighting technical potential study** – In early 2007 GDS designed a research plan and methodology for estimating the remaining technical potential in Maine for electricity savings for the residential lighting and appliances end uses. GDS is currently conducting a whole house inventory of lighting, appliances, and space and water heating systems in one hundred randomly selected homes in Maine and will use this data to provide a detailed inventory of the number of lighting sockets in the average home, the number of sockets on average that have high efficiency lighting installed, and a detailed estimate of the remaining technical potential for electricity savings with the lighting end use.
- **Market assessment and baseline studies** – Each year, GDS has worked with Lockheed Martin to conduct a market assessment research study of the residential lighting market. This survey collects data on the current status of the residential lighting market. Data collected includes the percentage of homes that have purchased and installed high efficiency lighting equipment and bulbs.
- **Market assessment data collection through focus groups** – Every year GDS conducts several focus groups with Maine consumers (participants and non-participants of the Lighting Program) and participating retailers to explore 1) new marketing

approaches for ENERGY STAR lighting fixtures and 2) market barriers for bulbs and fixtures among non-participants in order to determine if new marketing approaches or incentives are needed.

- **Market progress evaluation reports** – These regular market progress reports describe the trends observed with measurements from the annual store inventories compared to the baseline, and other market research that the MPUC Program Manager deems necessary for the program. GDS's role on these MPER reports has been to draft the sections of the report that deal with market assessment studies, technical potential studies, focus groups, and other secondary research conducted by GDS.
- **Residential Technical Resource Manual** – GDS is responsible for developing all of the residential lighting equipment and fixture measure characterizations (costs, energy savings, useful lives, load shapes, etc.) for the EM Residential TRM.
- **Program benefit/cost analyses** – Since 2004, GDS has been responsible for preparing annual updates of the Maine Societal Test benefit/cost ratio for the Residential Lighting Program. GDS collects annual data on the number of lighting equipment installations, measure costs, measure kWh and kW savings and measure lives. Then GDS calculates the program benefit/cost ratio using the latest available avoided costs for electricity available from the New England Avoided Energy Supply Component Working Group.

Efficiency Maine Business Program

GDS's roles on the Efficiency Maine Business Program include providing technical support to program participants and program allies, staffing the Efficiency Maine booth at trade shows, completing market assessment and baseline studies, tracking and reporting data, leading the development of the commercial technical resource manual, processing incentive applications, paying out incentives, performing program and measure benefit/cost analyses, and filing monthly program kW demand savings with ISO-NE for the interim forward capacity market. Listed below are descriptions of some of GDS's roles and responsibilities on the Business Program.

- **Technical support** – GDS field staff provide technical advice and support, including lighting savings analysis, to Maine businesses that need help identifying cost effective energy savings opportunities.
- **Program ally support** – The GDS field staff routinely work with program allies to assure that they have the latest program materials, are up-to date on program changes, and understand the incentive application process.
- **Training and speaking engagements** – GDS field consultants conduct Efficiency Maine Business Program training sessions for program allies and speak about the program at conferences, chambers of commerce, associations, and community group meetings.
- **Staffing of trade show booth** – GDS consultants schedule and provide staffing support for the Efficiency Maine booth at pertinent trade shows throughout Maine. At trade shows, GDS field staff explains the Efficiency Maine Program and provide up-to-date information on energy efficient technologies.
- **Post-installation inspections** – GDS field staff assist ERS's staff with post installation inspections at selected participant sites to determine if the installed equipment is in compliance with program guidelines and consistent with what was identified in the incentive application.

- **Market assessment and baseline studies** – GDS has conducted market assessment and baseline research for the Maine business sector to assess baseline energy efficiency levels in Maine for high efficiency motors, lighting, and HVAC equipment.
- **Data tracking and reporting** –With input from other team members, GDS was responsible for developing and implementing a Web-based data tracking and reporting system for the Business Program. This data system tracks all data necessary for reporting program kW and kWh savings, number of participants, and project costs.
- **Commercial Technical Reference Manual** – GDS was assigned the responsibility of leading the development of the measure characterizations (costs, energy savings, useful lives, load shapes, etc.) for the EM Commercial TRM.
- **Processing of incentives** – GDS and ERS are responsible for processing applications from Maine businesses for financial incentives and for entering data from the incentive application into the data tracking and reporting system.
- **Payment of incentives** – GDS is responsible for printing and mailing checks to program participants in order to pay financial incentives for energy efficiency measures purchased and installed through the program.
- **Program benefit/cost analyses** – Since 2004, GDS has been responsible for preparing annual updates of the Maine Societal Test benefit/cost ratio for the EM Business Program. GDS collects annual data on the number of equipment installations, measure costs, measure kWh and kW savings and measure lives. Then GDS calculates the program benefit/cost ratio using the latest available avoided costs for electricity available from the New England Avoided Energy Supply Component Working Group.

Listed below are references and project descriptions for key GDS program implementation projects.

Project Name: Efficiency Maine Residential and Business Programs

Client Organization: Maine Public Utilities Commission

Project Duration: July 2007 to June 2010

Client Reference: Denis Bergeron
Maine Public Utilities Commission
242 State Street
Augusta, Maine 04333
Phone: 207-287-3831

Project Description: GDS is part of a four-organization team that is designing and implementing the MPUC's Efficiency Maine Residential and Business Programs. These statewide energy efficiency programs are designed to provide financial incentives and technical advice on energy efficient electrical equipment to businesses in Maine.

Consultants: Richard Spellman, Timothy Clark, Bob Fratto, Peter Laiho, Ed Doiron, Amber Roberts, Jeffrey Huber.

Project Name: Consulting Services for Xcel Energy C&I Energy Analysis/Energy Assessment Program

Client Organization: Xcel Energy

Project Duration: August 2004 to July 2008

Client Reference: Sheryl Volkert, Product Portfolio Manager
Xcel Energy

414 Nicollet Mall (Ren. Sq. 7)
Minneapolis, MN 55401
Phone: 612-337-2140

Project Description: GDS was hired by Xcel Energy to provide energy audit and assessments services to small and large commercial and industrial customers as part of their Conservation Improvement Program (CIP).

Consultant: Rich Hackner, P.E. (Project Manager), Joe Danes, Glenn Gossfeld, Rich Hasselman, Brad Gehring

Fixed Fee
Peak demand reduction of 1.2 MW
Over 4,700,000 KWh of electric savings
Over 325,000 therms of natural gas savings
These totals begin in 2004 when we started working with Xcel Energy. The savings are from 77 different customer facilities that were audited, with most facilities ranging from 1,000 to 25,000 square feet.

Project Name: Efficiency Maine Residential Lighting Program

Client Organization: Maine Public Utilities Commission

Project Duration: March 2004 to June 2007

Client Reference: Richard Bacon
Maine Public Utilities Commission
242 State Street
Augusta, Maine 04333
Phone: 207-287-3831

Project Description: GDS was part of a five-organization (Aspen Systems, GDS Associates, LK Goldfarb Associates, Vreeland, APT) team that designed and implemented the MPUC's Efficiency Maine Residential Lighting Program. In April and May of 2004, GDS completed a series of four focus groups with non-participants in this program to learn more about market barriers that prevent homeowners from installing energy efficient lighting in their homes in Maine. The final focus group report for this project was completed in May 2004. GDS has also completed a Quality Assurance Plan for all data collection and analysis for this program.

Consultants: Richard Spellman (Project Manager), Amber Roberts, and Mac Mallinson.

Project Name: Design and Implementation of Wisconsin Focus on Energy Business Program

Client Organization: State of Wisconsin, Department of Administration

Project Duration: January 1999 to 2009

Client Reference: Jolene Anderson Sheil
Section Chief – Major Markets
State of Wisconsin, Department of Administration
101 East Wilson Street, 6th Floor
Madison, Wisconsin 53707
Phone: 608-266-7375

Project Description: GDS Associates is part of a team that has been designing and implementing state-wide energy efficiency programs for the commercial, industrial, and production agriculture sectors in Wisconsin since 1999. GDS is providing technical services to businesses and production agriculture facilities in Wisconsin relating to the economic feasibility and energy savings of energy efficiency measures.

Consultants: Richard Spellman, Richard Hackner, Timothy Clark, Joe Danes, Rich Hasselman, Glenn Gossfeld, Kelly Hermsdorf, and other GDS consultants.

4.2 Overview of Experience and Capabilities of Nexant

Nexant is a nationally recognized expert in the art of the measurement and verification of savings from energy efficiency programs. Nexant staff members have participated in the development of the International Performance Measurement and Verification Protocol (IPMVP) and the ASHRAE Guideline 14. This institutional knowledge makes Nexant unusually well equipped to conduct impact evaluations and to measure the performance of the most complex energy using systems.

Nexant has the demonstrated ability to conduct detailed evaluations for multiple utility companies, determining accuracy in program reported savings and evaluating lost revenue and extensive experience in measurement and verification services, having performed M&V activities for thousands of projects and having authored or assisted in the development of many of the industry's leading references, including the FEMP M&V Guidelines, the IPMVP Protocols, and ASHRAE Guideline 14-2002– "Measurement of Energy and Demand Savings." Recent evaluation projects include:

Measurement and Verification Evaluation – NYSERDA's New York Energy \$martSM Program (2003 – 2007)

Nexant was the M&V evaluation contractor for the New York Energy Research and Development Authority's (NYSERDA) New York Energy \$martSM portfolio of forty-three energy efficiency, market transformation and research programs, all funded through a system benefit charge. Our primary responsibility under this multi-year contract was to independently verify the energy (kWh) and demand (kW) impacts that result from the operation of the Program. Using our broad engineering experience with energy using systems found in commercial, residential, and industrial sectors, we reviewed project files to check that accepted savings calculation methodologies were used and correctly applied.

Nexant's responsibilities also included on-site project inspections to ensure that energy efficient equipment that received incentive money from NYSERDA was operating as designed. While on site we evaluate the potential energy savings and demand reduction for the project by quantifying new equipment performance and identifying the baseline conditions. On site activities included interviews with facility managers, witnessing equipment operation, collecting system information, and taking spot measurements of power, temperature, flow, or other parameters. Based on our findings, we determined the verified project savings, and applied the results to the sponsoring program. Nexant's M&V evaluation results were used to quantify benefits that were credited to the operation of the New York Energy \$martSM Program. The insights contained in the results helped NYSERDA modify their offerings to reach or exceed program goals.

Personnel: Salil Gogte (Team Leader, Project/Program Evaluator), Jim Herndon (Project/Program Evaluator), Peter McBride (Project/Program Evaluator)

Reference: Larry Pakenas, NYSERDA, 17 Columbia Circle, Albany, NY 12203-6399, (518) 862-1090 x3247

Evaluation of Con Edison (NYSERDA) System Wide-Demand Reduction Program (2006 present)

Nexant as prime contractor is leading a team of specialty contractors, including Summit Blue and GDS Associates, to provide comprehensive evaluation services for the Con Edison System-Wide Demand Reduction Program operated by NYSERDA. The team is providing reports to both Con Edison and the Department of Public Service that document the demand reductions and energy savings realized through as a result of the program's operations. The team's evaluation results are used to support lost revenue claims to be filed by Con Edison.

Personnel: James Moss (Management Oversight), Salil Gogte (Project Manager), Paul Monkman (Project Evaluator), Peter McBride (Project Evaluator), Victor Narkaj (Project Evaluator), Mark Maloney (Project Evaluator), Nisa Foster (Project Evaluator)

Reference: Judeen Byrne, NYSERDA, 17 Columbia Circle, Albany, NY 12203-6399, (518) 862-1090 x3514

Process and Impact Evaluation of Georgia Power Company's ENERGY STAR New Homes Program (2006-present)

Nexant is currently conducting a process and impact evaluation of the Georgia Power ENERGY STAR New Home pilot program to assist in successfully transitioning to a full scale program. The process evaluation includes assessing market demand, analyzing the program infrastructure, and conducting a best practices review of similar residential new construction programs around the country. The findings are incorporated into recommendations to improve the chances of success for the full scale program. The impact evaluation involves the determination of both gross and net energy impacts of the program through time-stamped electric metering, site inspections, and engineering analysis for a random sample of homes built through the ENERGY STAR New Homes program and homes not participating in the program. The results are used to verify or adjust program reported savings.

Personnel: Jim Herndon (Project Manager), Victor Narkaj (Project Evaluator)

Reference: Dean Harless, Georgia Power Company, 241 Ralph McGill Boulevard NE, Atlanta, GA 30308, (404) 506-1468

Table 14 below presents a summary of the full range of experience for Nexant's Energy and Carbon Management group.

Table 14: Nexant Experience Summary

Client	Project	Type ⁴	Term
American Electric Power	C&I Standard Offer Program	D	2000 - 2002
CA Dept. of General Services	Recommissioning Program	I	2007 - 2009
California Utilities	Due Diligence for Standard Performance Contract Programs	I	1998 - present
California Utilities	Statewide Recommissioning Programs	I	2006 - present
CenterPoint Energy	DSM Bidding Program	I	1996 - present
CenterPoint Energy	Recommissioning Program	I	2004 - present
CenterPoint Energy	Energy Star® Homes Program Design	D	2002

⁴ Type Key: P = potential, D = design, I = implementation, E = evaluation, T = technical support

Client	Project	Type ⁴	Term
CenterPoint Energy	AC Distributor Market Transformation Program Design	D	2001
CPS Energy	Market Potential Evaluation, Program Design, and M&V	PD	2008 - present
Energy Trust of Oregon	Program Delivery Contractor	I	2008 - 2010
Federal Energy Management Program	Performance Contracting Support	T	1997 - 2008
Federal Energy Management Program	Measurement and Verification	I	1997 - 2000
Georgia Power Company	Process and Impact Evaluation of ENERGY STAR New Homes Program	E	2006 - present
MidAmerican Energy	Energy Efficiency Bid Program	DI	2003 - 2004
MidAmerican Energy	Nonresidential Energy Analysis Program	I	2004 - present
NYPA	Energy Conservation Market Assessment	P	2005
NYSERDA	Standard Performance Contract Design and Database Development	D	1999
NYSERDA	Technical Assistance for CIPP, ECIPP, EFP	I	2002 - present
NYSERDA	M&V Evaluation for New York Energy \$mart™ Program	E	2003 - 2007
NYSERDA	SWP Evaluation	E	2007 - present
Oncor	Targeted Industrial Energy Efficiency Program	I	2008 - 2012
Oncor	Commercial Energy Audit Program	I	2008 - 2012
Pacific Gas & Electric	Analysis of Direct Load Control Options	T	2001 - 2004
PacifiCorp	Residential Cooling Equipment and Installation Practices Assessment	D	2005 - 2006
PacifiCorp	Energy FinAnswer Program	E	2001 - present
PacifiCorp	Cool Cash Incentive Program	PDI	2002 - present
PacifiCorp	FinAnswer® Express Program	PI	2004 - present
PacifiCorp	Self-Direction Credit Program	I	2004 - present
PacifiCorp	Recommissioning Program	I	2005 - present
PacifiCorp	Comprehensive DSM Market Potential Assessment	P	2006 - present
PacifiCorp	FinAnswer Express Market Potential Study	P	2004, 2007
Platte River Power Authority	DSM Market Potential Assessment	P	2006
Platte River Power Authority	Direct Load Control Savings and Market Feasibility Analysis	P	2003
Platte River Power Authority	Assessment of DSM Program Savings Potential and Costs	P	2001
Questar	Home Energy Audit and Weatherization Program	DI	2006 - present
Questar Gas	Recommissioning Program	D	2007 - present
Questar Gas	DSM Market Potential Assessment	P	2006
Salt River Project	Energy Efficiency Programs	DI	2008 - 2012
TXU Energy	Recommissioning Program	I	2008 - present
TXU Energy	DSM Bidding Program Design and Implementation	DI	1997 - present
TXU Energy	AC Installer Program - Baseline Study and Impact Evaluation	E	2002
TXU Energy	TEEM Program	DI	2000 - 2003
TXU Energy	Load Management Potential Study	P	1999
Wisconsin Focus on Energy	Market Assessment Study	P	2001 - 2002
Wisconsin Focus on Energy	Financial Strategies and Program Support	T	2001 - 2003
Wisconsin Focus on Energy	Energy Efficiency Performance (EEP) Program	I	1999 - 2002
Wisconsin Focus on Energy	Recommissioning Program	DI	2007 - present

Client	Project	Type ⁴	Term
Xcel Energy	Custom Efficiency Program	I	1999 - present
Xcel Energy	On-site Energy Assessment Program	I	2007 - present
Xcel Energy	Energy Design Assistance Program	I	2001 - 2005
Xcel Energy	Residential and Commercial AC and Evaporative Incentive Program	PDI	2001 - 2005
Xcel Energy	Recommissioning Programs	DI	2002 - present
Xcel Energy	Energy Efficiency and Peak Demand Reduction Market Assessment	P	2000 - 2001

4.3 Overview of Experience and Capabilities of Clark Energy, Inc.

Clark Energy, Inc. provides consultation on performance contracting proposals, cogeneration feasibility studies, and energy systems. They have over 20 years experience in Energy, HVAC, and Facilities Engineering. Clark Energy, Inc. is dedicated to finding cost effective solutions to energy needs and problems. Past accomplishments of Clark Energy, Inc. include the following:

- Reduced water usage in a manufacturing facility by over 30% using low cost/no cost measures.
- Reduced the downtime on cogeneration equipment by 90% by making equipment design changes.
- Designed, manufactured, and installed custom heat exchangers for cogeneration plants. Integrated hot water fired absorption and exhaust heat steam generators into cogeneration plants. All the above made cogeneration feasible at previously unfeasible facilities.
- Created spreadsheets to replicate utility tariffs and calculate energy savings from energy conservation measures. These spreadsheets improved accuracy and reduced engineering time for three ESCOs.
- Energy audits identified energy reduction of up to 80% (10 – 30% savings are more typical).

Clark Energy has experience in managing cogeneration and energy conservation projects in their entirety. They have designed, engineered, supervised, started up, and maintained energy projects. They have also helped customers select contractors to install energy projects. Clark Energy has done studies for installations from 60 KW to 10 MW along with design, installation, and maintenance of 50 KW – 1000 KW cogeneration plants. They have been employed by and consulted for private ESCOs and Utility ESCOs in proposals and energy audits. Clark Energy has conducted over 300 energy audits in which energy conservation measures identified include lighting, HVAC equipment, energy efficiency motors, variable speed drives, water conservation, heat recovery, energy management systems, controls, solar energy, cogeneration, fuel cells, ground source heat pumps, and process improvements.

Clark Energy, Inc. Client List

Energy Logic ESCO

Proposal Generation and Energy Auditing

- Completed energy survey of stores in regional Drug Store chain. Evaluated existing EMS system and HVAC equipment condition. Examined economizer damper and linkage condition and operation. Identified energy conservation measures. Identified

lighting and EMS contractors to perform installation of energy conservation measures. Prepared project proposals with firm price quotes.

Energy Assets (formerly Exelon)

ESCO

Proposal Management and Energy Auditing

- Completed energy survey of more than 80 buildings in Pennsylvania school district. Served as liaison between Exelon and its project partner to transfer all project proposal information. Performed energy audit of three buildings as part of the large healthcare system project.

CMS Viron Energy Services

ESCO

Energy Survey and Proposal Generation

- Surveyed large naval base to collect and document all mechanical systems and motors (>3 hp) by recording nameplate information and sketching piping, ductwork, and controls. Identified Energy Conservation Measures (ECMs). Helped to develop pricing and savings estimates for ECMs in proposal. Surveyed 5 schools in Pennsylvania school district to identify energy conservation measures and helped generate Performance Contracting proposal.

Conectiv

Major Accounts

Energy Survey and Sales Support

- Performed energy survey and prepared report for a regional drug store chain.. Teamed with salesmen on initial meetings with customers and helped design strategy to offer energy services.

Conectiv

Retail Energy Supply

Energy Survey

- Performed energy survey and prepared report for a regional convenience store chain.

PPL Spectrum

ESCO

Cogeneration and Energy Conservation Measures Spreadsheet

- Performed economic analysis of various cogeneration and heating/cooling options for a multi-building life-care campus. Price estimates and installation savings estimates were performed to determine economic feasibility. Measures analyzed included coal and gas fueled boilers, gas fired reciprocating cogeneration units, steam back pressure turbines, and absorption cooling. An electronic spreadsheet was created that allowed PPL to run different scenarios based on various assumptions.

Hartig Heat Exchanger

Air to Air Heat Exchanger Manufacturer

Energy Calculation Spreadsheets

- On two occasions, created electronic spreadsheets to calculate the energy savings and costs for air-to-air heat exchangers.

PECO Energy

Electric Utility
Energy Audits

- Performed energy audits for University, electronic manufacturer, and mushroom processor.

Onsite Sycom

ESCO
Energy Audit

- Performed energy audit of car parts manufacturing facility.

AJL Associates

Energy Consultant
Evaluation of Cogeneration Studies

- Evaluated two cogeneration studies for a cogeneration system at a large campus University. The technical and financial feasibility of the project.

4.4 Overview of Experience and Capabilities of Mondre Energy

MEI offers a full complement of consulting services to increase energy efficiency and cut energy costs. MEI will optimize its suite of energy consulting tools to customize a strategic energy cost reduction program for its clients.

These consulting services include the following;

- Strategic Energy Management Plan Development and Implementation. MEI offers a thorough audit and program recommendation, which utilizes analytical, engineering, legal, legislative, and financial expertise. MEI can also assist in the development of a comprehensive energy program that incorporates best practices and innovative procedures, and education of key management personnel and building personnel on the process so that there is “buy-in”. MEI believes that the strategies must be flexible, yet specific in their objectives and provide quantifiable and verifiable benchmarks for success.
- Commodity Procurement Programs. MEI constructs innovative ways to help its clients avert volatile energy pricing and regulatory red tape. A comprehensive procurement program for all commodities can reap great benefits. By using flexible options to maximize savings while minimizing price volatility, MEI has been very successful in hedging the commodity markets on behalf of its clients.
- Load Profile Development and Analysis. MEI evaluates energy use and demand patterns to find opportunities for improvement. Operational issues are addressed to ensure that each client is functioning at maximum efficiency.
- Tariff Analysis. For larger users, there is often more than one billing option available under the tariff. Those customers who access special tariff riders can enjoy substantial monetary benefit. However, the existence of the rider and or its applicability is not always known to the customer and therefore, the benefit will not be enjoyed. MEI navigates the tariffs that govern utilities to ensure that its clients are getting energy at the best possible rate.
- Account Reconciliation and Bill Auditing. Utilities and suppliers have many customers and are apt to make billing errors. MEI verifies that its clients are billed correctly. The benefit of these savings is obvious; recovered sums are sometimes substantial for the client.

- **Rate Intervention.** MEI maximizes client benefits by shaping the rate structure during regulatory proceedings. Proactive activity in this arena can be pivotal to a successful program. Direct intervention into rate proceedings insures that a client's interests will be protected during the rate making process, which often establishes how utility costs are allocated among utility customer classes well into the future. MEI has legal and technical expertise to assist its clients in regulatory proceedings to ensure that proper rate allocation and the interests of its clients are best served.
- **Utility Rate Negotiations.** MEI directs utility rate negotiations to ensure that its clients are in the strongest position to purchase the lowest cost energy from their utility providers. Savings as the result of creative negotiations by MEI on behalf of its clients have been substantial.
- **Demand Side Management & Energy Conservation Measures.** MEI presents creative solutions to minimize energy consumption or change usage patterns. MEI's staff includes Certified Energy Managers who can provide an assessment of a facility's utility consumption and identify significant savings opportunities for customers. Analysis of energy usage by category, i.e. lighting, HVAC, motors, and controls, are important considerations. Capital improvements are assessed in conjunction with a cost saving analysis to identify projects with attractive paybacks.
- **Project Financing Analysis and Project Management.** There are many different financing options available to the customer, including internal funds, debt financing, lease or lease-purchase agreements and energy performance contract. MEI assists its clients in achieving additional cost savings by helping to structure financing arrangements that yield net positive cash flow (savings less debt service) at all times.
- **Measurement and Monitoring.** MEI provides low cost options for measuring and monitoring energy consumption and cost. Developing a baseline of facility energy usage provides clients with a better assessment of cost reduction opportunities.
- **User-Friendly Analytical Tools.** New products, such our LAN and web-enabled database and load profile applications, allow clients to evaluate their energy plan, procurement, and usage to pinpoint new opportunities for energy savings.
- **Expert Witness and Legal Support Services.** MEI has energy analysts and attorneys on staff and the global experience and knowledge to guide its clients through any energy-related issues. Commodity Procurement Programs. MEI constructs innovative ways to help its clients minimize the effects of volatile energy pricing and regulatory red tape. A comprehensive procurement program for all commodities can reap great benefits. By using flexible options to maximize savings while minimizing price volatility, MEI has been extremely successful in hedging the commodity markets on behalf of its clients. We have also streamlined clients' contracting and procurement processes to take greater advantage of fast-moving market opportunities.
- **Cost and Rate Analysis.** Where a project involves rate modeling or calculations, MEI designs a new rate model if one does not already exist, and will verify the accuracy of the model by using inputs from customer utility bills and comparing the model output with the actual bill.
- **"Green" Power Initiatives.** MEI helps its clients take advantage of financial and environmental opportunities available from using "green," renewable power sources. We have access to green energy credit clearinghouses, which can produce new revenue

streams to reduce energy costs. Our experience also includes feasibility studies for our clients' development and/or acquisition of wind farms and alternative power plants.

- New Technology Analysis. We have helped clients achieve significant savings through the use of new types of biodiesel motor fuels and heating oils, as well as through the installation of new lighting technologies and more sophisticated building control systems. We are also working with clients to take advantage of financial gains to be made from peak demand curtailment, in which a supplier may "buy back" unused peak power from the client.

MEI EXPERIENCE

SCHOOL DISTRICT OF PHILADELPHIA -Electricity, Natural Gas and Fuel Oil Procurement, Demand-Side Management, Load Profile, Load Aggregation, Rate Intervention, Public Policy, Strategic Planning, Funding, Energy Services Contracts, Database Development, Strategies for Implementation [1998-Present]

The District uses electricity, natural gas, heating oil and/or steam at more than 300 facilities in the City of Philadelphia. There are more than 1600 active electricity, natural gas, heating oil and water accounts. MEI has worked with The District to identify its budgeting needs for energy-related commodities, products and services.

Mondre Energy has been providing the School District of Philadelphia ("The District" or "PSD") with energy management consulting since 1998, and has developed and overseen the implementation of a comprehensive program to reduce energy consumption at School District facilities. The program developed by MEI has encompassed both supply side and demand side opportunities, has saved the District more than \$20 million to date, and has identified \$9.2 million in demand-side savings.

a. Strategic Planning with Verifiable Results

MEI developed a new energy strategic plan for PSD for the years 2006-2010. In the first two years of the plan's lifespan, MEI identified \$9.2 million in demand-side opportunities, drafted an RFP to implement ECM programs, negotiated a \$650,000 settlement with Strategic Energy on top of a \$100,000 billing adjustment, reduced a potential \$1 million annual gas base rate increase to approximately \$150,000, negotiated a reduction in gas transportation and delivery fees of more than 30%, and provided more than \$9 million in savings to the District's gas and heating oil budgets.

b. Energy Services Contract ("ESCO")/Demand Side Project Development

MEI addressed The District's most critical demand side issues by developing a series of proposed ECMs with the potential to save the District \$9.2 million.

PSD engaged MEI to oversee the ESCO project for the implementation of selected ECMs from the Strategic Plan. We drafted the RFP and the contracts to be awarded to successful bidders. Preparing the RFP included writing technical specifications for the various ECMs, setting forth engineering standards for the performance of the systems and equipment used in the ECMs, researching potential funding sources and opportunities to reduce the impact to District's capital budget, and adapting complex District procurement and legal regulations to protect PSD's interests in the unique situations energy performance contracts present.

The ESCO project also will require us to develop a method of evaluating responses, negotiate contracts with bidders, work with the District's financial staff to develop requirements for rates of return and cash flows, and, once contracts are let, act as the owner's representative in the development and implementation of ECMs. We will then measure and verify the energy savings achieved by the ECMs.

c. Supply Side Management and Rate Modeling

MEI has undertaken large-scale electricity, oil and natural gas procurements on the District's behalf since 2003, providing PSD with a significant advance payment of savings by one electricity provider, and additional savings when market conditions proved favorable. MEI prepared the requests for proposals and contract documents for PSD, and analyzed responsive bids for electricity, fuel oil and natural gas.

MEI developed a comprehensive program under which PSD pursues competitive electric supply and utilizes risk management strategies in its procurement of heating fuel. Due to the volatility of the electricity market, MEI worked with the District to streamline and automate the bidding and contract process. MEI also implemented a program where PSD operates its dual-fuel boilers using fuel oil when the price of oil is lower than that of natural gas, and negotiated gas supply agreements with third party suppliers and interruptible transmission service contracts with PGW on the District's behalf. to secure more favorable transportation and delivery rates in the wake of deregulation in Pennsylvania. Additionally, MEI has implemented a fuel oil procurement strategy that provides the District with an array of hedging tools to mitigate fuel cost risks.

MEI's supply side strategies have provided energy cost savings to the School District of more than \$20 million from January 1999 to the present, including a negotiated electric supply contract buyout that provided PSD with savings that were 254% higher than the supplier's original offer and 13% greater than the expected savings had the supplier continued to serve the accounts. The District realized equally impressive savings on its purchases of natural gas and oil, as discussed below.

The District saved more than \$900,000 on firm and interruptible service in FY 2007, based on total consumption of 515,000 Dth of gas. With the increased purchase of third-party gas and Interruptible Transportation rate delivery services from PGW, we anticipate even greater savings in FY 2008.

The District also achieved substantial savings on heating oil purchases in FY 2007, and projects continued savings for FY 2008. Total savings was thirty percent (30%) percent of the allotted funds.

d. Energy Usage Tracking/Billing Management and Reconciliation

MEI has developed specialized software products and customized databases for PSD to ensure that its energy usage and utility bills are being measured and calculated correctly. MEI reviews the District's monthly electricity bills, analyzes them for compliance with contract and tariff rates, and identifies errors. When errors arise, we work with the District and the provider's staff to resolve problems amicably.

For example, we discovered during our analysis of The District's water bills that the

headquarters building at 440 N. Broad St. was not receiving the reduced rate to which it was entitled. MEI called the oversight to the attention of the Philadelphia Water Department ("PWD"), and the District will receive a refund of approximately \$18,000.

Since MEI began its tracking and billing reconciliation programs for the District, we have identified errors which could have cost PSD more than \$1 million. When disputes cannot be resolved at the operational level, we also provide support to the District's legal team, as set forth below.

e. Technical/Legal Support

i. Rate Analysis – Intervention and Support

Earlier last year, the District intervened in a Philadelphia Gas Works rate case before the Pennsylvania Public Utility Commission ("PUC"). The potential annual cost increase to the District for non-commodity charges alone was more than \$1 million. MEI provided technical and legal expertise to the District's legal team to minimize the impact of rate changes (in fact, PGW was awarded less than 25 percent of the increase it sought), and estimated expenditures for natural gas rates will increase by approximately \$150,000, representing less than one percent (1%) of the natural gas budget. MEI will reduce the impact of this increase through third party purchase agreements. MEI also was instrumental in securing an accounting of PGW's revenues from contracts for new District facilities.

PHILADELPHIA HOUSING AUTHORITY. (Load Profile, Rate Intervention, Tariff and Billing Analysis, Public Policy, Strategies for Implementation) [2003-Present]

MEI evaluated PHA's electrical and gas baseline utility consumption and billing history, and developed an energy accounting database to help PHA determine energy cost and consumption levels for various types of residential properties. MEI also conducted both consumption-based and engineering-based analyses of consumption, weather and demographic factors at various PHA properties with varying types of accounts (including PGW's LS accounts) to allow PHA to set tenant utility consumption allowances for new and existing homes, as required by federal law.

MEI participated in a HUD-mandated energy audit for PHA during the summer of 2006. Our staff conducted on-site inspections and evaluations of energy-consuming equipment and systems, studied the construction of the various conventional sites, calculated existing and projected energy costs for the various properties, reviewed cost/benefit and payback calculations, and wrote portions of the report to PHA.

MEI monitors Exelon's and Philadelphia Gas Works' respective rate and tariff structures and practices, and provided expert witness services on behalf of PHA in a Public Utility Commission proceeding challenging two proposed rate filings by PGW. The PUC limited PGW's recovery to less than 25 percent of PGW's initial request, and held the PHA-only rate at its current level. MEI also provides expert witness services and technical support to PHA's outside counsel in an ongoing federal proceeding involving tenant complaints regarding utility allowance levels, and in a federally mandated and monitored energy audit of various PHA properties.

MEI undertook an engineering-based review of tenant utility allowances at PHA Scattered Site properties, whose recommendations PHA adopted in seeking a reduction of utility allowances. Our studies of utility allowances have identified \$1.7 - \$2.1 million in potential savings for PHA. Additionally, MEI is reviewing plans for new construction of PHA residential properties to

determine energy consumption, gas infrastructure costs and heating alternatives such as utilizing solar energy.

PHILADELPHIA INTERNATIONAL AIRPORT. (Load Profile, Funding, Supply Side Management, Software and Database Development, Strategic Planning) [2001-present]

MEI was retained by the Philadelphia International Airport to study the effect, if any, of capacity constraints on the existing utility infrastructure subject to Master Plan improvements. MEI also provided an inventory of all major gas, fuel oil and electrical driven equipment, concluded by an evaluation of the utility load requirements of all existing site buildings to determine what infrastructure expansion will be required on the customer side of the utility meter for expansion.

MEI performed a site audit of all utility services, including electric, natural gas, fuel oil and water & sewer. MEI reviewed available site and building plans and evaluated all utility supply services from the utility meter to the site buildings. The audit established a utility meter inventory list including all nameplate and capacity data information and included site verification of the utility meter and location of supply service lines from the utility meters to the structures. We are currently assisting the Airport in the selection and installation of utility-grade electricity metering in tenant facilities.

MEI also developed a customized version of its database and load profile application, which has improved the Airport's internal tenant billing system and provides more accurate bills to tenants. Annual savings to the Airport are in excess of \$1.2 million.

Previously, MEI provided the Northeast Philadelphia Airport (the city's general and commuter aviation facility) with a preliminary assessment of utility infrastructure and managed the development a Master Plan for Northeast Airport.

PHILADELPHIA INDUSTRIAL DEVELOPMENT CORPORATION/PHILADELPHIA NAVAL BUSINESS CENTER (Strategic Planning, Load Profile, Distribution and Generation Alternatives) [March 2007-present]

MEI has been engaged to develop infrastructure and generation alternatives for the Philadelphia Naval Business Center. The Naval Business Center is a mixed-use, master-planned business campus which includes the City's cruise ship terminal, a commercial shipyard, and will soon add offices and manufacturing facilities for Tasty Baking Company, the headquarters for the Philadelphia Stock exchange, and a variety of housing types.

MEI's tasks include a global systems review, preparing a business plan for the energy infrastructure improvements necessary to support new and existing businesses in the rapidly growing Navy Yard complex; managing the effects of the expiration in 2010 of PECO's rate caps; evaluating the relative merits of wholesale vs. retail purchasing and adding on-site generation capabilities; and overseeing the implementation of recommended projects.

PENNSYLVANIA CONVENTION CENTER AUTHORITY (Load Profile, Account Reconciliation, Energy System Evaluation) [July 2007 – present]

The Pennsylvania Convention Center Authority has engaged MEI to evaluate energy systems in connection with the expansion of the Pennsylvania Convention Center in Philadelphia. The expansion will produce one million square feet of additional saleable space, and make the property the largest contiguous exhibit space in the Northeast.

MEI is reviewing all plans for energy-related systems, equipment, commodities, policies and practices for the expansion project. We will act as a liaison between the designers, engineers, energy providers, equipment vendors, and the Authority. We will provide reports to be used for the Convention Center's certification as a Leadership in Energy and Environmental Design ("LEED") building.

Additionally, MEI will provide account reconciliation services to the Authority for electricity, oil and natural gas.

TEMPLE UNIVERSITY HEALTH SYSTEMS (Energy Services Contract, RFP for ESCO and Management of Process) [January 2008-present]

The Temple University Health System ("TUHS") has retained MEI to perform a site assessments of all applicable Temple University Health System buildings to determine appropriate Energy Conservation Measures ("ECM") for the energy performance project RFP. Energy use and cost records as well as available building drawings for each hospital facility will be reviewed to identify opportunities for energy cost savings through cost effective energy saving strategies. MEI will also perform a preliminary technical evaluation of the ECMs selected in order to determine preliminary payback criteria for the technical concepts identified. MEI will pre-qualify bidders, issue and RFP, evaluate responses and make recommendations.

MONTGOMERY COUNTY, MARYLAND. (Procurement, Load Profile, Load Aggregation, Database Development, Public Policy, Funding, Strategies for Implementation) [1998-2006]

Mondre Energy provided Montgomery County, Maryland with energy management services beginning in July 1998, two years prior to the restructuring of the electricity industry in Maryland. MEI accomplished its three initial goals for Montgomery County: develop a strategy for a coalition of County and local governments and agencies to maximize the benefits of electric deregulation prior to the implementation of customer choice in Maryland; assist in the pre- and post-deregulation ratemaking process with the restructuring of the electric industry to enhance the County's position; and procure electric supply once retail electric choice was implemented.

Concurrently with supporting the County at the settlement hearings, Mondre Energy assisted the County in developing the first post-deregulation electric aggregation program for the County and its affiliated agencies. MEI educated these groups, and helped the aggregation members to achieve consensus on impending electric restructuring and the County aggregation program through on-site presentations using MEI-developed material. MEI provided guidance on how to design the procurement process to produce more favorable and cost-effective responses for the County.

MEI accumulated load data from County agencies and developed load profiles and an account tracking database. Subsequent to award of the supply contract, MEI provided support to ensure that accounts were transferred to the third-party supplier, and verified the PEPCO DS Credit for each account.

MEI also consulted with the County regarding a waste-to-energy facility whose energy output was under contract to PEPCO. MEI explored using the baseload generation for the County's needs in conjunction with third-party electric supply. MEI evaluated the sale of the output as "green power" and the use of the plant for peak shaving. MEI also evaluated the plant's output reliability and reviewed the facility's contracts with PEPCO.

Through Mondre Energy's efforts, Montgomery County developed and issued procurement documents for over 2,200 electric accounts and 894 million kWh (over 17 months) in PEPCO, BGE, and Allegheny Power service territories. The County saved more than \$7 million on overall electricity costs over the contract terms (December 2000 through July 2004). This is one of the most successful electric aggregation programs in the State of Maryland, and continues to produce savings for the members of the aggregation group.

MEI not only helped the County to control its traditional electricity costs, but also helped the County to increase its usage of "green power" at a reasonable cost. As part of a large-scale electricity procurement, MEI worked with the County to set minimum renewable energy requirements for each contract awarded. We also identified other green power sources available to the County including "green tags" which represent the environmental benefits derived from the generation of electricity from a renewable resource as compared to fossil fuel. We also developed a "reverse hedge" price protection mechanism with the County in the event that the cost of green power decreases relative to fossil fuel pricing. The green power program earned the County (and MEI) two National Association of Counties awards for innovative procurement and green power procurement.

MEI also provided support to the County's legal staff as it formulated strategies for legislative, regulatory and litigation responses to impending electricity rate increases.

PEPSI-COLA BOTTLING COMPANY OF NEW YORK, INC. (Procurement, Energy Audit, ECM development and implementation) [2001-Present]

MEI was engaged to analyze the installation of cogeneration at one of its facilities and to assess whether an opportunity existed to redistribute electric power from its bottling plant to its administration building. MEI negotiated the professional grade audit, provided an independent evaluation of the benefits and costs from ownership of transformers and switchgear; assisted with the development and issuance of Requests for Proposals for supply of all fuels; negotiated equipment and construction contract pricing; and assisted with contract terms and conditions. Partial funding for the project, which is currently under construction, is provided by the New York State Energy Research and Development County.

Additionally, MEI has been asked to maximize savings under a third-party electricity supply agreement, and is negotiating with a potential supplier based on our customized market forecasts.

PHILADELPHIA PHILLIES. (Load Profile, Database Development, Strategies for Implementation) [2002-present]

MEI was engaged by the Phillies for energy consulting services related to the design and construction of the team's Citizens Bank Ballpark. MEI assisted the Phillies with strategic planning, including database development and energy procurement. The initial evaluation included a study of the new electrical and mechanical building designs to ascertain economically feasible areas for energy efficiency improvement. MEI assisted the contractors in developing specifications and negotiating and reviewing contracts for electrical and natural gas supply systems for the ballpark, as well as evaluating energy load profile analyses focused on alternatives to traditional standby systems and utility tariff rate cost reductions, culminating in the installation of peak shaving generators. Now that the ballpark is operational, MEI provides performance monitoring of energy systems and cost analysis as required. MEI also negotiated a

natural gas transportation agreement on the Phillies' behalf. The initial phases of these programs saved the Phillies in excess of \$500,000 in energy costs and continue to produce savings of \$150,000 per month.

NEW JERSEY TRANSIT CORPORATION ('NJ TRANSIT'). (Load Profile, Public Policy, Strategies for Implementation)

MEI was selected by NJ TRANSIT to provide General Consulting/Energy Management Services to NJ TRANSIT's Office of Management Analysis. MEI was initially tasked to provide technical and regulatory support to NJ TRANSIT to minimize any cost impact from changes to electric distribution tariffs filed by New Jersey electricity utilities on August 1, 2002. MEI's efforts focused on ensuring that existing benefits to NJ TRANSIT were protected and retained as well as evaluate strategies whereby NJ TRANSIT could seek rate relief. MEI assisted with the preparation of testimony for the rate proceeding and presented expert testimony during hearings.

MEI's analysis projected the financial impact of regulatory filings on NJ TRANSIT. MEI's analysis demonstrated that the impact of one proposed rate schedule was much greater than stated by the utility. Based on MEI's evaluation, the utility reexamined and revised its proposed rate. The cost benefit from this change saved NJT \$600,000. Total negotiated discounts from the intervention reduced proposed base rate increases by \$30 million. Rates of return and return on equity were reduced as well as reductions in the rates of depreciation. In addition, benefits previously negotiated were maintained and benefits non-specified under tariff were now codified.

PARKWAY CORPORATION. (Energy Audit, Demand Side Management) [2001-Present]

MEI conducted a comprehensive energy audit for several parking garages and associated office areas in the City of Philadelphia. The energy audit focused on lighting improvements including the retrofit of fluorescent and incandescent lighting systems with electronic T8 and compact fluorescent fixtures. The lighting improvements for the HID systems in the garage areas included power reduction control systems where lighting levels were sufficient. MEI recommended time control modifications for some lighting systems based on daylight control. MEI also recommended power factor improvement on applicable electric accounts. Variable frequency fan drive systems were evaluated for garages with ventilation systems. MEI also conducted a complete electric procurement and billing reconciliation for all of the electric utility accounts.

COMCAST SPECTACOR, LP (Demand-Side Management, Strategies for Implementation) [2005-Present]

Mondre Energy assisted Comcast Spectacor, the parent company of the Philadelphia Flyers NHL ice hockey team, and the Philadelphia 76ers NBA basketball team, as well as an owner/operator of sports and entertainment facilities throughout the world, with a utility meter/billing dispute. MEI performed an analysis of the facility's load, evaluated the utility's analysis, and concluded that the utility had overstated the amount due. MEI's expert testimony at the arbitration hearing directly resulted in a reduction of the client's costs by approximately \$1 million. MEI also negotiated a \$300,000 contract buy-out when the third-party electric supplier withdrew from the retail market.

MEI evaluated the energy-consuming equipment at the 20,000-seat Wachovia Center sports arena to look for opportunities to improve the efficiency of the HVAC and ice storage systems within the various portions (e.g. the arena itself, adjoining broadcasting and office facilities) of

the building.

UPPER DARBY SCHOOL DISTRICT

MEI is presently performing a comprehensive site energy audit for the Upper Darby School District. This audit included an engineering evaluation of energy cost reduction opportunities for the 12 schools in the District. This effort will concentrate on central heating and cooling systems, building envelope, lighting, BMS controls, high efficiency equipment and other system retrofit opportunities.

WILLIAM PENN SCHOOL DISTRICT

MEI is presently performing a comprehensive site energy audit for the William Penn School District. This audit included an engineering evaluation of energy cost reduction opportunities for the 11 schools in the District. As with Upper Darby School District, this effort will concentrate on Central heating and cooling systems, building envelope, lighting, BMS controls, high efficiency equipment and other system retrofit opportunities.

ELWYN CO., IN ELWYN, PA.

MEI performed a comprehensive site energy audit for Elwyn. This audit included an engineering evaluation of energy cost reduction opportunities for the 25 buildings on the campus. As a result of MEI's efforts, Elwyn is presently in the procurement process for a lighting replacement project including over 5,000 fixtures. MEI will oversee the final procurement and construction of this project, as well as perform the measurement and verification strategies once the project is complete.

5.0 *Qualifications of Key Personnel*

5.1 **Bios of Key Personnel**

Resumes of GDS consultants and sub-contractors assigned to this project are provided in Appendix A. The GDS team consultants assigned to this project are listed below, and bios for each consultant are also provided.

GDS Team Personnel:

Richard F. Spellman – President (GDS)
Scott Albert – Principal (GDS)
Robert Fratto – Managing Director (GDS)
Thomas Londos – Managing Director (GDS)
Tim Clark – Managing Director (GDS)
John Davulis – Senior Project Manager (GDS)
Amber Roberts – Project Manager (GDS)
Peter Laiho – Project Engineer (GDS)
Jeffrey Huber – Analyst (GDS)
Caroline Guidry – Engineer (GDS)
JaMarcus Brewer – Engineer (GDS)
Bede-Julian Hampton – Regulatory and Business Support Analyst (GDS)
Kaytie Ruditys – Executive Assistant (GDS)
Andrea Jester – Engineering Assistant (GDS)
James Bradford – Senior Vice President (Nexant)
James (Skip) Moss – Northeast Regional Manager (Nexant)
Salil Gogte – Senior Project Manager (Nexant)
Peter McBride – Senior Project Engineer (Nexant)
Nisa Foster – Project Engineer (Nexant)
Jim Herndon – Project Manager (Nexant)
Mark Maloney – Project Engineer (Nexant)
Paul Monkman – Project Engineer (Nexant)
Victor Narkaj – Project Engineer (Nexant)
Jim A. Clark – Owner/President (Clark Energy, Inc.)
Judith L. Mondre – Found/President/Project Manager (Mondre Energy)
Peter D. Burns, CEM – Vice President (Mondre Energy)
Bradford M. Stern – Attorney (Mondre Energy)
Marjorie Ochroch – General Counsel (Mondre Energy)
Angelia Epps – Data Analyst (Mondre Energy)
Margaret Mary “Peg” Coley – Office Administrator (Mondre Energy)

Richard F. Spellman – President – Mr. Spellman is the President of GDS Associates and has 32 years of strategic planning, economic analysis, market research, program evaluation, renewable energy and energy efficiency program experience in the energy industry. He will be the Project manager for this large project for the PA PUC. Dick has managed several large-scale projects for GDS clients and has extensive experience with the design, implementation and evaluation of energy efficiency and demand response programs. He has completed numerous program evaluation and market research projects for GDS clients (including end-use metering, mail and phone surveys, internet-based surveys, in-depth interviews, focus groups, etc.). He has completed impact and process evaluations of energy efficiency, demand response and load management programs and has testified on the results of energy efficiency plans and evaluations before state regulatory commissions. He has extensive project experience involving

detailed measurement and verification of energy savings benefits. Before joining GDS in 1993, he was the Manager of Marketing and Product Development at Central Maine Power Company where he managed the design and implementation of the company's energy efficiency and demand response programs (with a budget of over \$26 million annually). He has served as the chairman of the New England Power Pool DSM Planning Committee in 1999 and 1992, and he serves on the Board of Directors of the Association of Energy Services Professionals (AESP).

Dick's education includes a BA degree with distinction in Math/Economics from Dartmouth College (graduated cum laude and with distinction) and an MBA from the Thomas College Graduate School of Business. He is a graduate of the University of Michigan Graduate School of Business Administration Management II Program, the Electric Council of New England Skills of Utility Management Program, and he is a member of the Association of Energy Services Professionals.

Thomas C. Londos – Managing Director – Mr. Londos has over 28 years of experience in energy management service delivery for commercial, industrial and government customers. He has provided design and management oversight for the development of three state energy programs in New York, Wisconsin and Oregon including the assembly of the infrastructure and staffing of these offices. These programs deliver energy management services to commercial industrial customers implementing retrofit and new construction programs at their facilities. Mr. Londos developed and implemented an integrated energy management strategy to further expand the business base of the corporation to include commercial/industrial customer market segments. These services include demand and supply side energy management consulting services that encompass commodity procurement, risk management and demand side energy efficiency improvements and demand reduction strategies. Customers have saved over \$100M through these services.

Mr. Londos has lead in the development and management of numerous hardware and technology programs for commercial and government customers. He has created testing protocol for the Gas Research Institute for the evaluation of natural gas energy systems for commercial/industrial applications. He has hands-on experience in the technical and economic evaluation of advanced cogeneration systems, engine-driven and absorption chillers and heat pump technologies. This included onsite assessments and evaluation of the operational feasibility of these systems in a variety of commercial and industrial applications.

Mr. Londos developed and managed field demonstration programs for the Gas Research Institute and the Massachusetts Department of Energy. He has evaluated natural gas conversion vehicles and all electric passenger cars under everyday driving conditions. Mr. Londos developed data acquisition and reporting system for tracking and analyzing vehicle performance under varying driving conditions. He led and managed the installation process of onsite fuel cell generation systems for a consortium of natural gas utilities. Installation applications included grid isolated and grid connected operating scenarios including interface with building thermal systems.

Scott M. Albert is a Principal of GDS Associates and Region Manager of the firm's Northeast Office, located in Manchester, New Hampshire. Scott has over twenty-five years of experience in the energy industry. Since joining GDS in 1999, he has worked on numerous electric and gas energy efficiency and renewable resource/distributed generation projects for clients throughout the Northeast and across the country. In addition, Mr. Albert has previously held supply and demand-side resource planning management positions with Boston Edison Company and

Public Service Company of New Hampshire, and has worked extensively with renewable resource projects and technologies.

Mr. Albert's has substantial experience in the following areas: commercial, industrial, and residential energy efficiency program design and budget development; program theory and logic modeling, process and impact evaluation; market characterization and baseline analysis and review; renewable resource/distributed generation and energy efficiency technology and technical potential assessment, cost-effectiveness model design; program cost/benefit screening; utility policy/strategy development; and non-utility party and regional collaboration. He has also worked on innovative energy efficiency pilot programs including: assistance with development of monitoring and verification protocols for energy efficiency, demand response and distributed generation project participation in ISO New England's Forward Capacity Market, and evaluation of on-bill financing programs. In addition, Scott has worked on both residential and commercial on-site generation and energy code assessment projects in the Midwest and Northeast regions.

Mr. Albert has also been involved in overseeing the development, technical, contractual, operational and regulatory activities associated with over 100 renewably-fueled, non-utility owned hydroelectric, biomass, municipal solid waste, landfill gas, wind, solar and animal waste-fueled facilities. Activities in this area included: design support and coordination of standard grid interconnection policies and procedures; short and long-term power purchase contract policy development, negotiations and implementation; net metering and retail wheeling issues identification and resolution; project development tracking; dependable capacity and annual energy determinations; operations monitoring; and regulatory filings and reporting.

Scott earned his Masters Degree in Business Administration from New Hampshire College and a Bachelor of Science Degree in Civil Engineering from Northeastern University.

Bob Fratto – Managing Director – Mr. Fratto is a Managing Director at GDS Associates. His thirty years of experience in the energy industry includes extensive work in the areas of energy efficiency services and utility demand-side planning, as well as load forecasting, resource planning and wholesale power marketing. Bob joined GDS in July 2004 after working as an independent energy consultant and holding various management and analytical positions with Progress Energy, The Cadmus Group and Commonwealth Electric Company (now NSTAR). He is currently based in Portland Maine where he is providing energy efficiency consulting services to Efficiency Maine, a statewide energy efficiency program, and Central Maine Power Company's Maine Power Reliability Program.

In addition to his work in Maine, Mr. Fratto has provided energy efficiency consulting services to various other clients including the U.S. Environmental Protection Agency, Bonneville Power Administration, GasNetworks, KeySpan Energy (now National Grid), the Hawaii Public Utilities Commission and Springfield Massachusetts Housing Authority. At Commonwealth Electric Company, Mr. Fratto held various management positions including, Manager Market Planning & Research, Manager Demand Program Administration and Manager Load Forecasting. At Progress Energy Mr. Fratto directed DSM planning activities, and designed and delivered various energy services. Mr. Fratto conducted a process evaluation of Bonneville Power Administration's Non-Wires Solutions Program and has managed process and impact evaluations for Commonwealth Electric Company.

Mr. Fratto earned his Masters Degree in Business Administration from Suffolk University and has a Bachelor of Science Degree in Industrial Engineering from Northeastern University.

Timothy Clark (CEM) – Managing Director– Mr. Clark has over 25 years energy efficiency program management, design, implementation and evaluation experience. In his capacity as Senior Project Manager for GDS Associates, Inc. he provides technical energy efficiency assistance to residential, commercial and industrial customers as well as trade allies in the states of Massachusetts, Maine, New Hampshire and Wisconsin. He has also completed numerous market research, data collection and data analysis projects for GDS clients in Maine, Massachusetts, and Indiana.

In his current capacity as the Field Staff Director for the Efficiency Maine Residential and Business programs, Mr. Clark acts as a liaison between the business community and program allies (the vendor community). He works with business owners to identify vendors that can meet their energy efficiency needs. Mr. Clark also recruits vendors who provide energy efficient equipment or services to the program participants. Mr. Clark provides technical advice and support to business owners who are looking to increase the efficiency of their business and need assistance identifying savings opportunities. He also promotes the Efficiency Maine Business Program to potential participants and equipment vendors at trade shows, through trade associations, local Chamber of Commerce, the Main Street Community Program and other local associations as well as trade shows.

Mr. Clark's education includes a BA and MBA in Business Administration from Thomas College. He has successfully completed the Association of Energy Engineers' Certified Energy Managers (CEM) and the Building Operators Certification (BOC) course. Mr. Clark is also a trained facilitator.

John Davulis – Senior Project Manager – Mr. Davulis possesses more than 30 years experience in economic modeling, short and long-term forecasting, energy analysis and DSM program management. In June 2008, John Davulis joined GDS Associates as a Senior Project Manager. In that capacity he provides energy consulting services related to sales and load forecasting, energy conservation planning and economic analysis. Prior to joining GDS, Mr. Davulis was the chief economist at Central Maine Power, an Energy East company. He was responsible for the preparation of CMP electricity sales and peak load forecasts. He directed staff activities related to estimating multiple regression equations and developing Excel spreadsheet models for short-term sales forecasting. He authored a monthly analysis of sales variance report and managed a variety of research projects. Mr. Davulis provided testimony before regulatory bodies on issues related to the Company's sales and peak load forecast, energy conservation and other economic matters.

Mr. Davulis joined CMP in 1986 as Principal Load Forecaster. From 1991 to 1999, he was Manager, Economic & Sales Forecasting. He led the Company's effort to implement the ENERGY 2020 Model for long-range load forecasting and energy management planning. He also provided consulting services to the Nationalna Elektrieska Kompania of Bulgaria related to its implementation of an energy planning and policy analysis model. In 1999, Mr. Davulis accepted additional responsibilities related to managing the Company's delivery of energy conservation programs, whose cost exceeded \$13 million in 2000. In 2001, he was named Chief Economist.

Earlier in his career, Mr. Davulis was Supervisor of Load Forecasting at New England Power Planning (now part of ISO – New England). While there, he worked with other economists to develop the NEPOOL Model for long-range load forecasting, one of the first such efforts in the U.S. Prior to that, Mr. Davulis was a Resource Economist at the University of New Hampshire, where he co-authored a number of research papers, twice taught a course in statistical methods, and testified before the Subcommittee on Dairy and Poultry, Committee on Agriculture, U.S. House of Representatives.

Mr. Davulis holds a B.A. in Philosophy from the University of New Hampshire, a M.A. in Philosophy from the University of Cincinnati, a M.S. in Resource Economics from the University of New Hampshire, and a Graduate Certificate in International Business from the University of Maine.

Between 1987 and 2008, Mr. Davulis has been a member of the NEPOOL Load Forecasting Committee and Chair, 1998-2000. Since 1993, he has served on the State of Maine's Consensus Economic Forecasting Commission. He has been a member of the Board of Directors for the Maine Energy Education Program since 1999.

Amber M. Roberts – Project Manager – Ms. Roberts joined the firm in November 2001 and has gained experience in managing developing and evaluating energy efficiency, renewable energy and other types of projects.

Since joining GDS, she has assisted with and/or managed the development of electric and gas technical potential studies, benefit/cost analysis of energy efficiency and renewable energy measures, development of web-based data tracking and reporting systems for energy efficiency and renewable energy resources, data collection and analysis; including telephone interviews, statistical and financial analysis, composing case studies and market research depth interviews for utilities and state agencies, including: Connecticut Energy Conservation Management Board (ECMB), Utah Energy Office, NSTAR, Maine PUC, Wisconsin Energy Conservation Corporation (WECC), Keyspan Energy Systems, the Vermont Department of Public Service, the New York Energy Research and Development Authority (NYSERDA), Brazos Electric, Arkansas Electric and Ameren, IL. Amber has extensive experience with the design, implementation and evaluation of energy efficiency and demand response programs. She has completed numerous program evaluation and market research projects (including end-use metering, mail and phone surveys, internet-based surveys, in-depth interviews, focus groups, etc.). She has extensive project experience involving detailed measurement and verification of energy savings benefits.

Ms. Roberts earned her Bachelor of Science degree in Mechanical Engineering Technology from Southern Polytechnic State University at Marietta in 2005. She is also a Certified Energy Manager (CEM) and has received certification in International Monitoring and Verification Protocols (CMVP) as well as being a Certification Demand Side Management Professional (CDSM).

Peter Laiho – Project Manager – Mr. Laiho, a Project Manager at GDS, has 19 years of success in electric utility customer service operations and energy efficiency program implementation. He works out of the GDS office in Fairfield, Maine. While at GDS he has provided technical energy efficiency assistance to commercial and industrial customers and trade allies in the State of Maine, as well as provided technical assistance and evaluation on industrial energy efficiency technical potential studies for the State of Maine, the state of New Hampshire, the Arkansas Electric Cooperative Corporation, Consolidated Edison of New York, and the Veterans Administration.

Mr. Laiho's previous experiences at Central Maine Power have equipped him with the tools and skills to expertly and professionally manage customer relationships and provided exceptional consultative services in all energy related areas. He holds certifications as a Certified Energy Manager, Business Energy Professional, Certified Sustainable Development Professional, Certified Lighting Efficiency Professional, and Certified Demand Side Management Professional. He is also a member of the Association of Energy Engineers, the Energy Services and Marketing Society, the Cogeneration and Competitive Power Institute, as well as a member

of American Society of Heating, Refrigeration and Air conditioning Engineers and the Illuminating Engineering Society of North America. Mr. Laiho has a BS and AS in Mechanical Engineering Technology from the University of Maine.

Jeffrey Huber – Analyst – Mr. Huber is an Analyst at GDS Associates and is primarily responsible for data collection and analysis for energy efficiency and demand response potential studies as well as energy efficiency program design and implementation projects. Jeffrey also provides technical support to GDS clients regarding benefit/cost analyses, energy modeling simulations, evaluation and verification of reported energy efficiency savings, and other market research studies. Jeffrey is experienced in conducting statistical analyses (frequency distributions, cross tabulations, multivariate analyses) and he is proficient in MS Office (Word, Excel, PowerPoint). Jeffrey has a BA degree in Criminology (2001) from the University of Florida and a MA degree (2004) in Anthropology from the University of Tennessee.

Caroline L. Guidry – Engineer – Ms. Guidry joined the GDS Marietta office in the fall of 2008. Caroline serves as an engineer for the Energy Efficiencies and Renewable Energy program. Her duties include: assisting with data collection, analysis, report writing and development of presentations; developing detailed economic analysis spreadsheets; conducting on-site energy audits and in-depth market research interviews; conducting building energy simulation modeling; and developing market research questionnaires and plans for market research studies. While at GDS, Ms. Guidry has also performed verification of technical potential study data. Prior to joining GDS Caroline worked toward the completion of her Masters of Science degree at Georgia Institute of Technology with the Sustainable Design and Manufacturing group of the School of Mechanical Engineering. She received her Bachelors of Science degree in Mechanical Engineering from Columbia University in 2006 and is an Engineer-in-Training certified by the State of New York.

JaMarcus Brewer – Engineer/Analyst – Mr. Brewer is an Energy Efficiency and Renewable Energy Engineer/Analyst at GDS Associates. JaMarcus has assisted with the development of energy efficiency potential studies and benefit cost analysis of energy efficiency and renewable energy measures. JaMarcus has also provided assistance with proposals submitted by GDS for Energy Reduction Projects. JaMarcus has provided assistance with creating manuals that measure peak impacts from measures and projects that receive cash incentives from the Ameren Illinois Business Program. JaMarcus is experienced in conducting energy and environmental site surveys. JaMarcus also has experience with managing Emission Data Recovery Programs and Energy Star related campaigns. JaMarcus is Proficient in MS Office (Word, Excel, Powerpoint, and Publisher). JaMarcus has a BS degree in Physics/Pre-Engineering (2005) from Dillard University and has received certifications from the Association of Energy Engineers in Corporate Carbon Reduction Strategy and 3D Load Profiling with IMD Online.

Bede-Julian (BJ) Hampton – Analyst – Mr. Hampton is an Analyst for GDS' Energy Efficiency and DSM group. Bede-Julian conducts research, data analysis, energy efficiency assessments and provides insight into the regulatory demands of proposals and client deliverables. While at GDS, he has also undertaken cost-benefit analyses and verification of technical potential study data.

Prior to joining GDS, Mr. Hampton coordinated energy assessments and strategies for improved facilities management at the City of Atlanta and Griffith University (Brisbane, Australia). He also developed commercialization funding proposals and advised on client sustainability and

stakeholder issues. He has a holistic understanding of the sustainability concept and stakeholder management.

Mr. Hampton holds a Bachelor of Jurisprudence (majoring in Global Governance and Public Law) from Bond University and a Diploma for Graduates (Management) from the University of Otago. He also spent time at Duke University Law School studying a variety of Public Law subjects and the Rotterdam School of Management studying Global Business-Stakeholder Management.

Jim Bradford, Senior Vice President in Nexant's Energy Management division will be the Principal In-Charge responsible for the overall quality of deliverables and providing strategic direction as needed. Jim has eighteen years experience developing and managing energy efficiency projects, measurement and verification, system modeling and simulation, development, use and evaluation of engineering algorithms and techniques, and HVAC system design. Jim leads Nexant's Energy Management division, managing staff in California, New York, Wisconsin, Utah, Texas and Colorado. Additionally, Jim provides primary client contact, technical direction, project management and oversight for many of Nexant's building engineering and technology projects and initiatives.

James (Skip) Moss is the Northeast Regional Manager and is responsible for planning, budgeting and profitability for Nexant's White Plains, NY office. He manages two project managers and three engineering personnel responsible for NYSERDA program evaluations.

Mr. Moss has twenty five years of experience leading successful teams in the development, financing and construction of a wide range of energy efficiency and on site generation projects. He has provided early industry advocacy for measurement and verification to effectively allocate risks and benefits of energy programs and to insure rate recovery.

As Vice President of Exelon/EPS, Mr. Moss developed and implemented efficiency and within the fence generation projects combined with Exelon commodity services, retaining PECO's base load generation and providing a dispatchable wholesale capacity value to PECO. Mr. Moss has an excellent five-year track record of developing procurement and financial risk management strategies for electricity and natural gas procurement in deregulated markets including the use of commodity swaps and block and index strategies. He has extensive technical experience in quantifying savings potential and verifying performance of energy projects. He also has a wide range of management experience working with multi-disciplinary teams, developing and negotiating contracts, crafting winning proposals and managing key customer relationships.

Salil Gogte is a Senior Project Manager in Nexant's Energy and Carbon Management Business Unit focusing on program management support and engineering technical support. He currently manages and oversees all evaluation activities for the Con-Edison-NYSERDA System-Wide Demand Reduction and Gas Efficiency programs. He designs and supports demand response evaluations, market assessments, research and technical potential studies for major utilities including Con Edison and NYPA. He also supports our clients' performance-based energy savings programs by providing technical reviews, inspections and audits for a variety of energy efficiency projects for residential, commercial and industrial customers. He serves on EVO's IMPVP M&V Methodology Technical Committee and develops and reviews M&V guidelines and protocols.

Salil's areas of technical expertise include design and analysis of HVAC mechanical and control systems and industrial processes, as well as whole buildings; optimizing system design, building

energy simulations; measurement and verification of energy savings, statistical analyses, energy audits, commissioning and retrocommissioning, billing analysis and estimating demand response potential.

Peter McBride, P.E. is a Senior Project Manager in Nexant's Energy and Carbon Management Division. Mr. McBride's expertise includes project management for energy efficiency programs and the measurement and verification of savings in pay-for-performance contracts. He has performed energy audits of over 25 single and multifamily residential buildings on behalf of NYPA (New York Power Authority), AIMCO (Apartment Investment and Management Company), MidAmerican Energy, and NYSERDA (New York State Energy Research and Development Authority). Mr. McBride's prior experience includes fourteen years designing, specifying, and selecting power generation systems. Peter holds an M.S. from Arizona State University and a B.S. from the University of Massachusetts, both in Mechanical Engineering. He is a Registered Professional Mechanical Engineer in New York and Massachusetts.

Nisa Foster is a Project Engineer for Nexant in the Energy & Carbon Management division based in White Plains, New York. Nisa currently works on evaluation contracts for various conservation programs administered by NYSERDA and Con Edison in New York and the Ontario Power Authority (OPA) in Canada. She also supports the implementation assistance group working on the Existing Buildings C&I Programs administered by NYSERDA. Nisa is experienced at evaluating rate-payer funded energy efficiency and demand response programs. Nisa has a Bachelors of Science in Mechanical Engineering from Queen's University in Canada.

Jim Herndon is a Project Manager with Nexant. Mr. Herndon currently supports a variety of publicly funded energy efficiency and demand-side management programs for government agencies, utilities, and commercial clients in the Eastern U.S. Mr. Herndon's experience includes program development, marketing, auditing, and program evaluation. His project work has included providing project management, performing electrical metering and conducting engineering analysis of metered data, site inspections and facility auditing at residential (single family and multi-family), commercial, and industrial facilities to determine energy savings, and performing technical reviews of energy efficiency projects.

He is presently acting as the project manager in conducting a program evaluation of Georgia Power Company's ENERGY STAR New Homes program, and has recently completed the impact evaluation work for NYSERDA's Home Performance with ENERGY STAR program. Mr. Herndon holds an M.S. in Engineering Management and a B.S. in Civil Engineering from Duke University. Prior to joining Nexant, he worked as a project manager and engineer with I.T. Corporation, providing environmental engineering services to public and private sector clients. Jim has also successfully completed RESNET-accredited home energy rater training.

Mark Maloney is a Project Engineer for Nexant in the Energy & Carbon Management division based in White Plains, New York. He currently evaluates projects for the NYSERDA Enhanced Commercial/Industrial Performance Program and System Wide Program. Mr. Maloney has also completed utility-sponsored scoping audits for MidAmerican Energy in Iowa and project evaluations for the NYSERDA Gas M&V and ComEd Smart Ideas programs. Mr. Maloney has a Masters in Chemistry from the University of Connecticut and a Bachelors in Chemical Engineering from Rensselaer Polytechnic Institute.

Paul Monkman is a Project Engineer in the Energy & Carbon Management division based in Ithaca, New York. Mr. Monkman is currently leading Nexant's evaluation of the 2008 Home

Energy Solutions program for the Connecticut Energy Conservation Management Board and five CT electric and natural gas utilities. In addition, he is contributing technical and oversight serves for the evaluation of C&I DSM programs for the Ontario Power Authority (OPA), and he provides support for the implementation assistance group working on the Existing Buildings C&I Programs administered by NYSEERDA. He also contributes technical analysis to the evaluation of various NYSEERDA C&I programs. Mr. Monkman's experience includes evaluation of DSM programs, implementing DSM programs, project management, DSM program design, and analysis of energy conservation measures using engineering algorithms and computer simulations. His skills have been essential to the successful design, implementation, and evaluation of energy-efficiency programs. Mr. Monkman received his M.S., Summa cum Laude, in Building Energy Systems from Colorado University at Boulder. He earned his B.S., with Great Distinction in Mechanical Engineering, from Clarkson University

Victor Narkaj is a Project Engineer in the Energy & Carbon Management Division based in White Plains, NY. Mr. Narkaj currently assists project managers with the execution of energy efficiency evaluation tasks. Specifically, Mr. Narkaj has worked on assignments including energy billing analysis, inspection visits of facilities, general energy audit analysis, informational surveys and general client interaction. His energy evaluation strengths range from assisting in the development of evaluation methodology to the actual execution of said methods accompanied by detailed calculation and reporting. He has worked on contracts involving clients such as NYSEERDA, ConAgra and Con Edison. Mr. Narkaj holds a Masters in Mechanical Engineering from Rensselaer Polytechnic Institute.

Jim Clark is the Owner/President of Clark Energy, Inc. Mr. Clark provides consultation on performance contracting proposals, cogeneration feasibility studies, and energy systems. His clients included ESCOs, performance contractors, electric and gas utilities, heat exchanger manufacturer, cogeneration companies, and boiler energy management company. ESCOs include Johnson Controls, Noresco, Energy Assets, CMS Viron Energy Services, Exelon, PPL Spectrum and Onsite Sycom. His services include representation in bid meetings, assist and develop sales plan, train technical staff, prepare proposals, evaluate technical and financial feasibility, calculate energy and operational savings, prepare financial analyses, estimate or obtain firm project costs, identify additional opportunities, and find unique solutions to turn around projects.

Judith L. Mondre is the President of Mondre Energy and Project Manager. Ms. Mondre has a distinguished history of public service including her appointment as the first Executive Director of the City of Philadelphia Energy Office under then Mayor, Ed Rendell. She has been recognized by local, state and national entities including the EPA, DOE, National Association of Counties, and was acknowledged as on the "Best 50 Women in Business in Pennsylvania." Ms. Mondre is a featured panelist on energy and woman-owned small business programs, has served on mayoral and gubernatorial transition teams, and has served as technical advisory to energy publications. Ms. Mondre has been the key negotiator for all client discounts and settlement payments, strategic plans and will be the point of contact for all Government client engagements including oversight of all work product performed.

5.2 Roles of Key Personnel

Overall Program Manager

Mr. Spellman is the President of GDS Associates and has 32 years of strategic planning, economic analysis, market research, program evaluation, renewable energy and energy

efficiency program experience in the energy industry. Dick has managed several large-scale projects for GDS clients and has extensive experience with the design, implementation and evaluation of energy efficiency and demand response programs. He has completed numerous program evaluation and market research projects for GDS clients (including end-use metering, mail and phone surveys, internet-based surveys, in-depth interviews, focus groups, etc.). He has completed impact and process evaluations of energy efficiency, demand response and load management programs and has testified on the results of energy efficiency plans and evaluations before state regulatory commissions.

Deputy Program Manager/Impact Evaluation Manager

Mr. Londos has over 28 years of experience in energy management service delivery for commercial, industrial and government customers. He has provided design and management oversight for the development of three state energy programs in New York, Wisconsin and Oregon including the assembly of the infrastructure and staffing of these offices. These programs deliver energy management services to commercial industrial customers implementing retrofit and new construction programs at their facilities. Mr. Londos has lead in the development and management of numerous hardware and technology programs for commercial and government customers. He has created testing protocols for the Gas Research Institute for the evaluation of natural gas energy systems for commercial/industrial applications. He has hands-on experience in the technical and economic evaluation of advanced electric and gas end use technologies. This included onsite assessments and evaluation of the operational feasibility of these systems in a variety of commercial and industrial applications.

Process Evaluation Manager

James (Skip) Moss is the Northeast Regional Manager and is responsible for planning, budgeting and profitability for Nexant's White Plains, NY office. He manages two project managers and three engineering personnel responsible for NYSERDA program evaluations. Mr. Moss has twenty five years of experience leading successful teams in the development, financing and construction of a wide range of energy efficiency and on site generation projects. He has provided early industry advocacy for measurement and verification to effectively allocate risks and benefits of energy programs and to insure rate recovery.

Process Evaluation and Impact Evaluation (Field Support)

Judith L. Mondre is the President of Mondre Energy and Project Manager. Mondre Energy will support in the process evaluation components of the program and onsite personnel for the impact evaluation field checks. Ms. Mondre has a distinguished history of public service including her appointment as the first Executive Director of the City of Philadelphia Energy Office under then Mayor, Ed Rendell. She has been recognized by local, state and national entities including the EPA, DOE, National Association of Counties, and was acknowledged as on the "Best 50 Women in Business in Pennsylvania." Ms. Mondre is a featured panelist on energy and woman-owned small business programs, has served on mayoral and gubernational transition teams, and has served as technical advisory to energy publications.

Impact Evaluation Support

Jim Clark is the Owner/President of Clark Energy, Inc. Mr. Clark provides consultation on performance contracting proposals, cogeneration feasibility studies, and energy systems. His clients included ESCOs, performance contractors, electric and gas utilities, heat exchanger manufacturer, cogeneration companies, and boiler energy management company. His services include evaluate technical and financial feasibility, calculate energy and operational savings, and prepare financial analyses

6.0 Statement of Potential Conflicts of Interest

GDS Associates, Inc. has no conflicts of interest for this project for the Pennsylvania Public Utility Commission. GDS does not have any relationships between itself or its employees and the EDCs (Duquesne Light Company, Metropolitan Edison Company, PECO Energy Company, Pennsylvania Electric Company, Pennsylvania Power Company, PPL Electric Utilities Corporation, and West Penn Power Company or their employees). GDS has not performed any work during the past five (5) years for any of the EDCs.

Robert Smith, a GDS Vice President, was involved in negotiations in a recent PPL (Pennsylvania Power and Light) Electric Utilities Corporation transmission rate filing at the Federal Energy Regulatory Commission (FERC). For this docket, the GDS clients were PPL transmission customers. The case number was Docket No. ER08-1457. The case was settled through negotiations.

During the last five years Butch Solomon (then a Vice President of GDS) did work where GDS took positions (on behalf of a GDS client) that were adversarial to West Penn Power Company and PPL Electric Utilities. Both were transmission and/or distribution rate matters before the FERC and both were ultimately settled.

To the best of its knowledge, Nexant has no conflicts of interest and has taken no adversarial positions against the seven EDC utilities listed in the RFP.

Clark Energy has no conflicts of interest to our knowledge and has taken no adversarial positions against the utilities participating in the Act 129 Programs.

Mondre Energy has no existing conflicts with any State EDC.