Response to NEEA RFQ # 50817, Market Research Contractors

October 11, 2018

SUBMITTED TO:
Northwest Energy Efficiency Alliance

SUBMITTED BY:
NMR Group, Inc.

NMR Group, Inc.

October 11, 2018

Anu Teja
Senior Project Manager, Market Research & Evaluation
Northwest Energy Efficiency Alliance
421 SW 6th Avenue, Suite 600
Portland, OR 97204
atej@neea.org

Re: NMR RESPONSE TO NEEA RFQ #50817, MARKET RESEARCH CONTRACTORS

Dear Anu:

In Response to NEEA's RFQ #50817, Market Research Contractors, NMR Group is pleased to submit qualifications for all three areas of the RFQ: Research Methodology; Sample Design and Recruitment Strategies; and Data Files Development, Analysis, Synthesis, & Reporting.

Lynn Hoefgen founded NMR in 2001, after having established the energy practice at Opinion Dynamics Corporation in 1989. NMR has since grown to a staff of 41 employees and is now 50% owned by an Employee Stock Ownership Plan (ESOP).

NMR conducts research on a wide variety of markets and issues to help energy-efficiency program administrators meet their goals. We offer in-house technical expertise in a broad range of market research methods. Table 1 in Section 1 provides a sample of the market research data collection and analysis methods with which NMR has experience. This is not an exhaustive list, but rather a cross-section of our most commonly used approaches.

NMR is particularly well suited to carry out market research to support NEEA in meeting its market transformation goals. We have conducted many of the key evaluations of market transformation efforts in Massachusetts and California, so our staff bring an understanding of the purposes of NEEA's research that other firms may not. Many of our employees have experience conducting market research in energy and other areas. The NMR senior staff members who will direct NEEA market research studies have many years of experience designing and conducting market research and evaluation studies for energy-efficiency program administrators across the US and Canada. Table 2 in Appendix A shows the market research experience of the staff members we propose. Each staff member was directly involved in managing many of the projects that we present as examples in this proposal.

We have extensive experience conducting market research with the kinds of market actors (including consumers) commonly targeted by NEEA's programs. NMR has relied on numerous approaches when reaching out to or studying market actors (Table 4 in the

Appendix). As the examples in these qualifications will show, NMR has experience conducting research to size markets; understand market readiness; map market structures; assess use, attitudes, and perceptions about products; understand the competitive set; map the decision-making process; gather and understand expert opinions; analyze market trends; and more.

One of NMR's two core values is producing the highest quality work possible, which affects all our day-to-day and long-term business decisions. Our approach to quality control and improvement, as outlined in Section A.2.2 of Appendix A, specifies core quality control (QC) practices for all projects, as well as practices that are distinctive to specific evaluation tasks (e.g., project planning and design and data analysis review). NMR's president, Lynn Hoefgen, conducts interviews with clients as projects conclude, or at critical junctures during long-term projects, to assess how to improve the quality of reports and presentations, communications, timeliness, and value provided.

NMR also demonstrates its commitment to producing the highest quality work possible by maintaining and improving staff's ability to meet the needs of our clients. NMR staff are members in the American Evaluation Association (AEA) and Association for Energy Service Professionals (AESP). Our company believes in supporting the individual growth of its employees. To encourage employee development, our company offers a professional development reimbursement program to eligible employees who attend job-related seminars. Enabling staff members to pursue professional development also furthers NMR's other core value: care and concern for colleagues' professional and personal welfare. Adherence to this core value has helped us achieve one of the lowest employee turnover rates in the industry. This low turnover improves quality by maintaining institutional memory of projects and programs, and by allowing us to assign truly experienced staff to lead projects.

NMR has already demonstrated our experience with utilities, energy efficiency, and supply chain audiences through our response to RFQ #50817 for Evaluation and Planning Contractors.

We hope to be able to demonstrate our quality, service, and commitment in future market research projects for NEEA.

Sincerely,

Tom Mauldin
Executive Vice President

Table of Contents

Section 1 Technical Competence

1.1 Research Methodology

All NMR senior staff members are accomplished in designing research to meet clients' objectives and budgets and help them understand the complex markets their programs address. NMR commonly designs mixed method studies that rely on multiple research methods – often combining qualitative and quantitative data sources. This allows us to triangulate estimates or synthesize results to obtain a more complete, nuanced understanding of a market, a process, or a target audience. Although every study NMR undertakes is directed by a senior staff member with extensive experience in research design, staff at all levels have engaged in mixed-mode studies.

In designing each study, we work with the client to identify and clarify their needs and develop actionable research questions and approaches. We aim to produce the most comprehensive, methodologically defensible research approach to answer the research questions and meet the study goals within the client's budget and timeline. We recognize that study resources (e.g., data availability, timeline, or budget) sometimes force the client and researcher to propose alternative approaches that strike an appropriate balance among competing pressures. NMR works closely with the client to identify which aspects of the study do and do not allow for flexibility, and to decide on acceptable adjustments to the research design. Examples of common adjustments include relaxing the precision requirements for quantitative results, limiting the number of research questions, reducing sample sizes, or changing the data collection or analysis methodology. Once the client and NMR agree on scope, we draft a detailed work plan that describes the method(s) to be used to answer each research question, topics of inquiry for each data collection effort, detailed budget, schedule of work, and staffing plan. After the client has approved this detailed work plan, NMR implements the study design and tasks.

We typically work with the client to determine the specific research questions that will need to be answered to meet the client's research goals. This may involve refining research questions the client already has in mind or developing research questions in dialogue with the client. These research questions form the framework around which we then design the research instrument(s) for every study. For every instrument we develop, we prepare a matrix that shows which research question(s) each piece of information we collect will support.

Once the work has begun, the NMR Director-in-Charge meets with the client by phone on a regular (usually bi-weekly) basis to provide status updates on the project. This regular meeting ensures that the client learns early on about any impediments to data gathering or analysis, and NMR and the client can adjust work schedules or scope as needed so that there are no surprises.

NMR's work has addressed a wide range of energy use applications and related issues, employing primary and secondary research methods and using a variety of quantitative, qualitative, and mixed method approaches. Table 1 provides a sample of methods that NMR has used in various market research projects. This is not an exhaustive list, but rather a cross-section of our most commonly used approaches.

Table 1: Market Research Data Gathering & Analysis Methods

Research, Analysis, and Data Collection Methods	Research Type		Data Type[1]		Analysis Performed
	Primary Data Collected	Secondary Data Used	Qualitative	Quantitative	
Case studies	●		●		●
Concept testing	●		●		●
"Fast feedback" surveys	●			●	●
Delphi or expert panels	●		●	●	●
Document & literature reviews		●	●		●
Econometric analysis	●	●		●	●
Engineering analysis	●	●		●	●
Equipment metering	●			●	●
Ethnography	●		●		●
Focus groups – in person	●		●		●
Focus groups – on line	●		●		●
Forecasting market trends	●	●		●	●
In-depth interviews	●	●	●	●	●
Intercepts	●		●	●	●
Journey mapping	●		●		●
Market segmentation		●			●
Market share and sales data	●	●		●	●
Participant observation	●		●		●
Residential panels	●	●		●	●
Survey research[2]	●			●	●
Web scraping and bibliometrics	●	●	●	●	●

[1] Research methods with bullets in both the qualitative and quantitative columns can be considered mixed methods. Mixed method or mixed mode also refers to studies that rely on multiple sources of data.
[2] NMR does not offer in-house telephone survey data collection. For CATI telephone surveys, NMR designs and tests the data collection instruments, analyzes the results, and works with CATI service providers to field the survey. We select the CATI provider for each study by competitive bid, or use the provider specified by the client.

1.2 Collection and Use of Quantitative Data

One of NMR's core values is to perform the highest quality work possible. Nowhere is this value more evident than in the attention we pay to implementing quantitative data collection and analysis procedures that have contributed to the advancement of industry best practices. As Table 1 showed, and as we discuss below, NMR has used numerous techniques to gather quantitative data. In addition to the survey, on-site inspections and metering, and web-scraping approaches we describe below, we have also collected quantitative data using more traditionally qualitative methods, such as in-depth interviews and Delphi panels. We have cleaned and vetted the data and used a wide variety of secondary quantitative datasets, such as program tracking data, utility billing data, product sales and market share data, and descriptions of market segments (e.g.,

number and size of home performance contractors in a region). We find that descriptive statistics (e.g., means, proportions) provide the answers to most research questions posed by our clients, but some studies require the use of more advanced techniques, such as linear and non-linear regression, econometric forecasting, and engineering analysis using specialized software.

Survey research: NMR frequently gathers quantitative data via surveys, often using a mixed-mode approach that utilizes multiple modalities: mail, phone, web, or mobile device. Given poor response rates of mail and phone surveys, we prefer to field web or mobile-device surveys whenever possible, but some studies or populations are better suited to mail, phone, or a mixed mode survey. A common design involves inviting respondents to answer a web survey, then following up with a phone survey to boost response rates. This approach is especially effective when paired with a financial incentive. NMR surveys aim for an eight-grade reading level whenever possible. We pre-test questions for understandability and effectiveness. To avoid long surveys that cause respondent fatigue and reduced response rates, we carefully consider whether each question is really needed to meet research objectives.

On-site visits: NMR gathers quantitative data via site visits when we need to determine or verify current measure installation rates and efficiency levels. We are a recognized industry leader in conducting baseline studies on new and existing single-family homes, and we have expanded our capabilities to multifamily and commercial facilities in recent years. NMR has redefined best practices for conducting lighting socket saturation visits by instituting and disseminating protocols that produce replicable results and the ability to track changes over time through repeat visits to a panel of customers. Our many quality control checks include warnings that pop-up in electronic data collection forms for erroneous or unusual entries, revisits to a subset of homes to verify the accuracy of data, and follow-up calls to assess satisfaction with the quality of the visit.

Web-scraping: NMR has used web-scraping to develop longitudinal inventories of products and product characteristics at national retailers. Web-scraping allows us to gather data on product availability, price, features, page placement (e.g., featuring the product on a *landing* page), ENERGY STAR qualification, and other relevant information. NMR has even scraped for qualitative data, including assessing product reviews for content and sentiment. NMR has found that web-scraping is an inexpensive and non-intrusive way to obtain a great deal of information about products from a range of retailers and regions of the country.

Compilation and analysis of secondary data: This category covers a wide variety of data sources and uses. The most relevant for market research include the analysis of sales data and market characterization studies. NMR regularly tracks the state-level sales of light bulbs for multiple clients using third-party data, which has helped inform decision-making about program intervention and possible market exit strategies. We have also modeled secondary data to explain market trends and forecast adoption rates and applied secondary data to existing algorithms to verify energy consumption and savings estimates for multiple consumer products. We have used third-party sources to understand the nature and diversity of various market segments, often as the first step in developing a sample frame and sample design for other quantitative or qualitative data collection efforts.

To simplify our workflow and help ensure more consistent secondary data collection, NMR has begun developing an internal lighting, appliances, and HVAC equipment efficiency data warehouse. This warehouse draws in part on EPA's ENERGYSTAR Product Finder, AHRI's

Certification Directory, and California Energy Commission's MAEDBS (which can be difficult to use or incomplete due to the frequent archiving of older models), as well as the DOE, FTC, CEE and AHAM. This involves tracking down archival data, scraping websites, extracting tables from PDFs, and collating and cleaning the results to remove duplicate, erroneous, or conflicting information.

1.2.1 Examples of Quantitative Research

One recent example of NMR's innovative quantitative data collection work is the Massachusetts Lighting Decision Making study. Performed for the Massachusetts Program Administrators from 2015 to 2018, the objective of this study was to understand the factors that influence efficient lighting purchases and why some consumers persist in purchasing inefficient alternatives. To meet this objective, the study made use of a combination of **third-party sales data** and primary survey research. NMR conducted this study in cooperation with InfoScout, which maintains a nationwide panel of mobile application users who upload receipts from shopping trips in exchange for various rewards. NMR developed **mobile application surveys** that InfoScout administered to samples of 275+ known lighting purchasers in Massachusetts and New York State in 2016 and again in 2017. The sales data yielded estimates of market share overall and by retail channel, while the mobile application survey allowed NMR to delve into the light bulb purchase decision with known recent light bulb purchasers. The survey addressed topics such as whether bulb purchases are planned or spontaneous and the influence of factors such as energy-efficiency, bulb shape / technology, familiarity, coupons, and in-store signage on their decision.

As a second example, drawing on diverse methodologies and data sources, NMR has conducted numerous studies across multiple years to track lighting market indicators for the Massachusetts Program Administrators (PAs). While the earliest studies date to 2004, NMR instituted the current Lighting Market Assessments in 2013. The purpose of these assessments is to collect a time series of quantitative indicators that describe the current state of the lighting market and the influence of PA programs on that market, and to examine emerging issues related to changes in the lighting market. The studies rely on **phone and web surveys** with PA residential customers and **on-site saturation visits** to customers' homes. We compare these indicators over time and between Massachusetts and portions of New York state that lack upstream energy-efficient lighting programs. In the most recent assessments, on-site visits have included repeat visits to a **panel of homes**. The longitudinal nature of the data collection and the inclusion of a panel of homes has allowed NMR to track such quantitative indicators as household penetration of efficient bulbs, socket saturation by lamp type and shape, and lamp storage, purchase, and replacement behavior. To date, five waves of panel visits have been completed in Massachusetts and three waves of panel visits have been completed in New York. The most recent panel sample sizes were 381 in Massachusetts and 217 in New York. NMR will conduct another round of panel visits in Fall 2018. The on-site data collection protocols for this study have advanced data collection best practices, as outlined in a 2015 IEPEC paper and poster.

1.3 Collection and Use of Qualitative Data

NMR is an industry leader in qualitative research methods. We offer deep expertise in design, execution, and reporting. NMR staff members have collectively designed scores of in-depth interview (IDI) and focus group guides. We have conducted thousands of IDIs with residential,

commercial, and industrial (C&I) market actors, including product designers, retailers and distributors, end users, and everyone in between. We have led numerous in-person and virtual focus groups with diverse participants and covering a wide range of topics. We have made innovative use of Delphi Processes to set prospective net-to-gross ratios for multiple products and to determine program attribution for codes and standards programs. We have extensive experience conducting document and literature reviews, case studies, and ethnographic research. Below, we provide brief descriptions of some, but by no means all, of the qualitative methods that we commonly use.

In-depth interviews: In-depth interviews (IDIs) rely on structured or semi-structured questions for stakeholders. NMR seeks respondents' perspectives in their own words, probing when necessary for clarity or to ask follow-up questions. At times, the interviewing process is iterative and requires follow up conversations with the same set of respondents or outreach to additional stakeholders.

Focus groups: The focus group structure allows for direct questioning while providing opportunities to observe dialog and interactions within the group. The technique is also particularly useful for learning about consumers' reactions to new products or services. NMR typically conducts **in-person focus groups** but has recently performed online or virtual focus groups with boiler manufacturers. The **virtual focus group** can be conducted synchronously or asynchronously. An alternative virtual focus group format, called a **bulletin board focus group**, permits participants to log on at their convenience and respond to discussion questions and follow-up probes over the course of a few days.

Document and literature reviews: Documentary materials that generate from energy-efficiency programs or policies – legislation, filings, reports, planning documents, manuals, etc. – are rich sources of information. These materials provide a useful check on data gathered through other means (e.g., interviews, surveys, program data) and can corroborate or challenge existing theories or assumptions. NMR routinely extracts information from document reviews as an early phase of a research project. This type of review helps answer initial questions for the study and often informs the development of data collection instruments and protocols.

Each of these qualitative methods can be combined with other qualitative or quantitative approaches to provide a more comprehensive understanding of a topic. Qualitative research can also be examined in a quantitative fashion by coding and categorizing data.

1.3.1 Examples of Qualitative Research

As a subcontractor to DNV GL (formerly KEMA), NMR assessed the C&I chain and franchise (C&F) market in Massachusetts for the Massachusetts Program Administrators. The study characterized the size and composition of the market with the objective of identifying promising approaches to working with chains and franchises and boosting energy savings in this sector. To help meet this objective, NMR conducted a **literature review** and **IDIs with chain & franchise managers and program administrators.** The literature review and interviews with eight efficiency program administrators' national account managers provided context on the market structure and the decision-making processes and criteria that chains and franchises apply to energy-efficiency improvements. In-depth telephone interviews with 21 C&F managers from across a variety of market segments delved deeper into the customer decision-making process.

To increase the likelihood of completing interviews with difficult-to-reach decision makers in this large, heterogenous market, NMR tailored the interview guide, outreach and recruitment strategies, and data collection to individual interviewees' needs and concerns. We integrated the information with the quantitative C&F customer profile data collected by DNV GL to round out our characterization of the market.

The 2018 study What's Next for Products is a market scan intended to help the Massachusetts Program Administrators as they plan for the future of the residential lighting and residential consumer products initiatives, given significant market changes and escalating federal standards. The study gathered and reported market intelligence from experts and thought leaders across the United States who have examined, or were in the process of examining, new residential energy and demand savings measures. NMR identified products for possible inclusion in the Massachusetts 2019 to 2021 residential program portfolio that could successfully produce savings. NMR completed **IDIs with 23 experts and thought leaders**, including ENERGY STAR consultants, members of regional and national energy-efficiency organizations, program administrators, evaluators, and smart power strip manufacturers. The interviews covered a wide range of topics, including the energy savings and demand response potential of efficient products, the role of emerging technologies, and innovative program designs, among other topics. (See Section A.2.4 for the IDI guide.) The team also conducted **secondary research** based on the key takeaways of these interviews, identifying relevant reports, products and technologies, and other valuable information. NMR staff members summarized the research in a 2018 ACEEE paper.

1.4 Deployment of Mixed Method Approaches

A combination of both qualitative and quantitative approaches, or the use of more than one data collection method, can strengthen research quality by allowing researchers to triangulate estimates or to synthesize observations and data from a variety of different sources for a more comprehensive and accurate understanding of the market, process, or a target audience being examined. For this reason, NMR frequently implements mixed-mode approaches to address diverse research objectives. When we employ a mixed methods approach to meet the needs of a project, we leverage strengths of both approaches to complement one another. For example, while individual interviews or focus groups may not provide generalizable results, the findings from such efforts may be used to identify questions for a larger scale survey effort, of which the findings can be generalized to the population. Conversely, we may use a survey to recruit participants for a focus group or on-site visit during which we can gather more in-depth insights into consumer behavior.

1.4.1 Examples of Mixed Methods Research

The Connecticut HES Air Sealing, Duct Sealing, and Insulation Practices used a **mixed-methods research** approach to identify opportunities for the program to increase savings related to air sealing, duct sealing, and insulation measures. To meet these goals, NMR collected primary data and conducted secondary research. This comprised **quantitative data from on-site quality inspections** by certified HERS (Home Energy Rating System) raters; **qualitative data from IDIs** conducted on-site with homeowners, participating vendors, and participating quality control inspection vendors; **qualitative observational data** and IDIs with participating vendors**,** performed by experienced NMR auditors who accompanied the vendors to sites; and **IDIs with**

program administrators from peer programs and **review of related program evaluation reports**. We closely coordinated data collection with other research efforts that were concurrently underway to maximize efficient outreach and minimize respondent fatigue. While some of the methods address individual research questions, the inclusion and interviewing of the original home performance vendors on some on-site inspections allowed the vendors to explain in real time some of the unique challenges in the home that may have influenced their measure installation practices. This mixed-method approached lent additional richness and insights to the study on factors that affect field practices and realization rates. The findings are summarized in a 2017 IEPEC paper.

NMR produced the Massachusetts C&I Boiler Market Characterization Study Phase II in 2017 as a subcontractor to DNV GL. The study goals included understanding the rate of change in the baseline efficiency level of commercial boilers, characterizing the current market for new boilers in Massachusetts, and facilitating trade ally sharing of market information with the C&I boilers program, among others. To achieve these goals, NMR conducted a series of **qualitative and quantitative tasks**. These included conducting comparative research on condensing gas boiler programs in the Northeast based on a **review of program materials and IDIs**; fielding a mixed-mode (email and telephone) **quantitative and qualitative survey** of manufacturers to obtain estimates of current and projected annual sales of small C&I gas boilers; **analyzing** publicly available **secondary data from the Air-Conditioning Heating and Refrigeration Institute (AHRI) product directory and from boiler manufacturers** to map product lines; reviewing the draft US Department of Energy Notice of Proposed Rulemaking for Commercial Boiler Standards; and **facilitating an online focus group** (boiler *roundtable*) with manufacturers and program staff to discuss the Massachusetts gas boiler market and the Massachusetts Program Administrators' prescriptive gas boiler rebate program. NMR integrated the findings of these disparate research activities into on overall report, drawing connections among the results. (See Section A.2.4 for the instrument.) The Massachusetts 2013 Lighting Market Assessments, described in Section 1.2.1, is also an example of mixed method research.

1.5 Recruitment and Sampling Strategies

1.5.1 Sampling Considerations

At NMR, we design samples that reflect the needs and resources of the client, project, and the population of interest. **We adhere to industry best practices but avoid the *one-size-fits-all* sample design.** We draw on the **spectrum of probability sample designs**, ranging from simple random samples to other, more controlled sample selection procedures, such as systematic sampling, stratified random sampling (including proportionate and disproportionate stratified sampling), multistage cluster sampling, and probability proportional to size (PPS) sampling. Familiarity with the full range of sample design approaches helps ensure the best precision, given available resources. Following the data collection, if appropriate, we develop weights to ensure that the results are representative of the target population and/or to adjust for disproportionate stratum sample sizes.

To determine sample sizes, we most often plan for sampling errors of ±10% at the 90% confidence level for the entire population and, if applicable, for subgroups of interest. When possible, we use existing empirical estimates to design our sample (e.g., known market share

percentages or coefficients of variation [*cv]* for hours of use). Lacking prior finings, we turn to industry rules of thumb, such as a 50% break in responses for results to be reported as proportions, or *cv* of 0.5 (for homogenous populations) or 1.0 (for heterogenous population).

Certain methodologies (e.g., **IDIs, focus groups, Delphi Panels**) require us to deviate from the approach above. In these cases, we most often determine a sample size based on a combination of the number of potential contacts that the client or we can identify, our professional knowledge of the population, and the timeline and budget.

1.5.2 Recruitment Strategies

NMR varies recruitment strategies based on the data collection methodology, characteristics and size of the population, and the availability of contact information to achieve desired samples. Below, we highlight some of the most common strategies. We are happy to provide NEEA with additional details on these and other approaches upon request.

Surveys: As mentioned above, our recent experience shows that **mixed-mode (phone and web) or web-based** surveys tend to yield adequate sample sizes with acceptable representativeness and response rates for most consumer populations. **Our recruitment strategies vary based on the information at hand**. A typical approach to fielding a mixed-mode or web-based survey includes **developing a sampling frame** (often involves purchasing a list or using client lists); **sending an advance letter** with information about the study and instructions about how to participate; and **following up** with postcards, emails, or phone calls to remind people to participate. If we have difficulty securing desired completions, we will sometimes release more sample and repeat the process above, often targeting subgroups to ensure representativeness of the population. While NMR most frequently hires a survey house to send advance letters and program and field surveys, we have increasingly developed **in-house capabilities** to field surveys with simpler programming or small desired sample sizes.

In-depth Interviews: NMR staff members almost always **directly recruit respondents** for IDIs. We have found that direct recruitment, rather than using an external service, is more convenient and efficient for the respondent and conserves project resources. Our approach to recruitment varies by project and population but typically involves a combination of outreach directly by phone and email. We leave voice mails and will attempt up to five phone calls and three emails to secure the interview. We will occasionally use incentives for IDIs (e.g., with certain trade allies) but interviewees often work for government agencies, organizations, or companies that cannot accept incentives. In these cases, we will forego the incentive or offer to make a contribution to a charity.

For **both in-person and online focus groups**, NMR typically relies on the focus group facility to recruit participants. The facility staff is in the best position to provide details on the logistics of the groups. The most significant variation in recruitment for focus groups involves whether NMR provides a targeted list to the facility staff or asks the staff to recruit from among lists that they maintain. This decision is made with the client and depends on the availability of contact information, the target population, and the research questions. NMR closely monitors the recruitment to ensure that participants meet study requirements and have the desired characteristics. For online focus groups, NMR uses the web-based platforms provided by focus group facilities to moderate discussions and pose questions to respondents. See Massachusetts C&I Boiler Market Characterization Study Phase II for more detail on this approach.

1.5.3 Examples of Sampling and Recruiting Strategies

The Lighting Market Assessment studies conducted for the Massachusetts Program Administrators, described in Section 1.2.1, used innovative recruitment strategies to identify households to participate in the recruitment surveys and on-site visits. To complete the on-site saturation visits, we relied on three samples: recruitment survey respondents, initial on-site visit participants, and panel on-site visit participants.

To **recruit** participants for an on-site lighting visit, NMR fields a general consumer survey following the procedures for surveys described in Section 1.5.2. We send an **advance letter** with a **prepaid incentive** to PA residential customers and invite them to take part in a web survey. The letter lists a **web address and unique identification number**. After a set number of days (often two weeks), we make **follow-up phone calls** to secure the desired number of completions, which is equal to four times the number of on-site visits we wish to complete. During these recruitment surveys, we ask a series of questions about the household's lighting use and demographic characteristics. We also ask the respondent if they would be willing to take part in an on-site visit for an additional incentive. We have found that about 50% of respondents express interest in the on-site visit.

After completing the recruitment survey, we begin to call respondents who expressed interest in the **on-site visit**, prioritizing interested survey respondents in **difficult-to-reach subgroups** (e.g., low-income, renters, etc.). When calling to schedule the on-site visit, we remind interested respondents of the additional incentive for participation and offer a range of time slots, including evening and weekend visits. We typically secure on-site visits with about one-half of interested survey respondents (or one-quarter of all survey respondents).

We also recruit **panelists from among prior on-site visit households**. We send them a letter reminding them of the previous visit(s), note the incentive, and ask if the panelists if they would like to take part in the current study. We provide a phone number that they can call to schedule the visit, but we also explain we will call them to gauge their interest. We have generally found that about 75% of prior respondents want to take part in the visit again.

A critical aspect of the Massachusetts C&I Boiler Market Characterization Study Phase II, described in Section 1.4.1, was obtaining input from boiler manufacturers. Before conducting the data collection, the team needed to develop the appropriate sample and recruit research participants. To **develop the sample**, the team selected 20 boiler manufacturers who had completed interviews for a previous study and 20 other manufacturers identified as producing gas boilers for the small C&I market. The team conducted internet searches and placed telephone calls to help identify appropriate contacts at these manufacturers. In some instances, the sample contained both a parent company and its subsidiaries. In these instances, the team kept the parent company within the sample and removed the subsidiaries. This resulted in a **final sample** of 32 manufacturers. To encourage manufacturers' cooperation, NMR developed an **advance letter** using PA logos. The letter briefly described the Phase I study and indicated that the manufacturers would soon be contacted by members of the team to solicit their feedback about the Massachusetts boiler market for the Phase II study. NMR **recruited** manufacturers by email, if the email addresses were available, or by telephone if email was not available. The team also conducted follow-up calls and sent emails to encourage participants to respond. We made

multiple contact attempts with respondents when needed, with an average of seven attempts per contact over the course of the task.

1.6 Approaches to the Synthesis of Results

NMR synthesizes results by weaving together a coherent, compelling, and actionable deliverable that draws on observations and findings across all data types, data sources, and tasks. Deliverables typically take the form a detailed or presentation-style final report, but we have also prepared spreadsheet-based tools that assist clients in program planning and in assessing program potential and cost effectiveness. We organize summary deliverables based on study objectives and research questions rather than data source or task.

The data we collect – especially quantitative data – can usually be analyzed in a variety of ways to uncover relationships among variables of interest. As project budgets rarely support exploring all possible data relationships, we make sure to plan our analysis in advance with the client. We will propose an analysis plan, discuss the plan with the client, and refine the plan to ensure that NMR and the client agree on the type and scope of analysis to be undertaken. That said, we have also found that exploratory data analyses may reveal new, potentially fruitful analytic avenues. In such cases, we will discuss the opportunity and potential value they present with the client prior to proceeding with an amended analytic approach. Before we begin work on summative deliverables, we present the client with an outline of the proposed deliverables that describes how we plan to organize the results. We engage in a dialogue with the client to ensure that we synthesize and present the results in the way that best meets the study's needs within the project budget.

1.6.1 Example of Innovative Synthesis of Results

NMR created the initial Market Adoption Model (MAM) for the Massachusetts PAs in 2011 to help them explore the impact of current upstream residential lighting programs and plan for future programs given rapid change in the lighting market stemming from the Energy Independence and Security Act (EISA) and the introduction of general service LEDs and halogen bulbs. NMR developed the MAM as an adjustable spreadsheet-based planning tool through which the PAs could explore different what-if scenarios, predicting energy savings under different assumptions about future market share and program activity. Over time, the PAs found that the MAM was most useful as a tool for predicting delta watts given changing market share baselines for LED and CFL bulbs relative to halogen and incandescent bulbs. Using MAM-derived delta watts, the PAs currently calculate annual and lifetime savings, determine effective useful life,[1] and plan future program offerings (including a timeline for market exit). NMR currently develops three separate MAMs, one for general service lamps, a second for reflector lamps, and a third for globe and candelabra lamps.

The current MAM synthesizes market share information from numerous evaluation studies; market intelligence gathered by NMR staff members, PAs, and Energy Efficiency Advisory Council (EEAC) consultants through conversations with ENERGY STAR Partners and lighting

[1] The Massachusetts PAs take increased federal standards and natural market adoption into account when deciding how many years they can claim savings from residential lighting. This determination is based on a combination of delta watts, market share, and other factors.

industry experts; and their own insights about the state, regional, and national market. The objectives of the most recent MAM, published in 2018, were to update the models for general service and reflector lamps from the previous version of the MAM, develop a new MAM for specialty lamps, and estimate delta watts through 2025 for each of the models. The 2018 models not only would serve as the basis for annual program filings for 2017 but they also would inform the Massachusetts 2019 to 2021 program planning process. Therefore, the development of the MAM had to be transparent and reflect widespread agreement about the assumptions that inform predictions of delta watts through 2025.

NMR started the development of the 2018 MAMs by gathering estimates of recent and future lighting market share and market information obtained through primary and secondary research. Data sources included IDIs with program suppliers (manufacturers and retailers), bulb shipment data, bulb sales data, and both a consumer panel and on-site saturation panel administered by NMR. Market information came from program suppliers, ENERGY STAR® partners, news articles, blog posts by industry leaders (e.g., NEMA, ACEEE), and reviews of recent rulemakings and lawsuit settlements stemming from EISA. The NMR team compiled this information into a spreadsheet, summarized it in PowerPoint, and presented it to the Massachusetts PAs and the EEAC consultants. Using these data, as well as their own expertise and knowledge, the PAs, EEAC consultants, and lighting experts at NMR each made predictions about the market share of LED, CFL, halogen, and incandescent lamps in the absence of the program from 2017 through 2025 for general service, reflector lamps, and specialty lamps. The three groups met via webinar to discuss their predictions and the reasons behind them. Since the market data became available over time, this was an iterative process. The groups had two additional opportunities to update their predictions based on the most recent evaluation findings and market information. The final predictions were equally weighted for each group to yield one set of predictions for each lamp type from 2017 through 2025.

The end result is a tool that is informed by a wide range of data and sources, is based on estimates that take the expertise and perspectives of different stakeholders into account, and to which all stakeholders buy in. Clients benefit from this work by having a tool they can confidently manipulate to understand the implications for delta watts of changes in program parameters. They can adjust their assumptions about parameters, such as the sales of lamps by lumen bin, etc., and use the resulting delta watts to estimate how long the program will ultimately support savings. Clients also benefit in that the work provides them with a way to understand their residential upstream lighting program in the broader context of regional and national markets.

1.7 TECHNIQUES USED TO REPORT AND PRESENT DATA

NMR organizes each interim deliverable and final report to meet the client's specific reporting needs. This often involves organizing the findings of our reports around the research questions, which we tie back to the research goals. This helps ensure that the report focuses on the big picture and is concise, logical, and coherent. If the client and NMR determine that a report is not the best way to deliver the information, we will work with the client to develop a different approach to meet their needs (such as the one we describe for the MAM in Section 1.6.1).

We recognize that our clients' reporting needs and expectations are changing. Many efficiency program administrators now prefer the use of well-designed graphics to summarize evaluation

results, relegating the detailed results to an appendix. To address this change, NMR recently developed a new report template that shares numerous characteristics with NEEA's preferred reporting approach. NMR's template calls for a one-page infographic that summarizes findings and recommendations, a short executive summary, a medium-length body, and appendices with additional study details. We expect that some readers will read the entire report, while others will only skim through the body or the one-page synopsis and executive summary. Our report template is designed to encourage project staff to convey information graphically whenever possible, reasonable, and acceptable to the client. Developing informative graphics can be time-consuming, so we use a variety of software packages to speed the process, including Piktochart, Lucid Chart, Inkscape, and Tableau.

Throughout the reporting process, NMR staff will regularly communicate with NEEA and, as appropriate, other stakeholders regarding preliminary findings and their implications. We will confer with NEEA to ensure that we deliver results in the format best suited to meet NEEA's needs, and we will use NEEA's template for reporting.

1.7.1 Example of Techniques Used to Report and Present Data

NMR is the prime contractor for all Residential Lighting, Products, and New Construction (RLPNC) evaluation for the Massachusetts PAs. We deliver numerous reports under this contract and have developed an approach that ensures that each report meets the PAs' needs with the appropriate level of actionable information.

Once data collection is complete, NMR gives the PAs a high-level presentation of preliminary results, focusing on the key research questions. This consists of reviewing the charts and tables that we anticipate will be most critical to the report and leading a conversation to obtain PA feedback on which results are most interesting and useful from the data, and which may warrant additional analysis. These presentations usually last 20 to 30 minutes and are part of our bi-weekly check-in meetings. NMR does not draft the report until after this presentation and feedback.

The PAs typically prefer the delivery of a draft, revised, and final report for a project. When we deliver revised reports, we include a tracked version showing the changes made between the draft and revised document and a clean version that retains comments and responses to them but accepts all other changes. NMR will also sometimes deliver a matrix showing all the comments made on the report and how we responded to them. This way the PAs know that we have taken every comment into consideration in our revisions. The use of matrices varies based on the project needs and the personal preferences of the client and project manager.

Since NMR just instituted one-page graphic-heavy summaries for RLPNC reports, these are not yet available online. An example of a one-page summary for the Massachusetts Residential Lighting Market Assessment can be found in Section A.2.3.

Appendix A

A.1 Company Information

A.1.1 Staff Biographies

In the table below, we show the market research experience of the staff members we propose. This is followed by resumes of key staff that include biographies.

Table 2: Market Research Experience of Proposed Staff

Research, Analysis, and Data Collection Methods	Tom Mauldin	Rohit Vaidya	Lisa Wilson-Wright	Monica Nevius	Alyssa Na'im	Joanne O'Donnell	Russell Meyer	Melissa Meek	Jayne Piepenburg	Tim Steis
	Executive VP	VP	Director	Director	Sr. Proj. Manager	Sr. Proj. Manager	Sr. Quant. Analyst	Research Analyst	Research Assoc. II	Research Assoc. I
Case studies		●	●			●		●		
Concept testing		●	●							
"Fast feedback" surveys *										
Delphi or expert panels	●		●	●	●					●
Document & literature reviews	●	●	●	●	●	●	●	●	●	●
Econometric analysis			●				●	●	●	
Engineering analysis	●									●
Equipment metering*										
Ethnography		●		●						
Focus groups—in person	●	●	●		●					
Focus groups—on line	●	●								
Forecasting market trends		●	●		●	●	●			
In-depth interviews: market actors	●	●	●	●	●	●		●	●	●
In-depth interviews: residential or C&I customers, general population	●	●		●	●	●		●	●	●
Intercepts		●	●				●			
Journey mapping				●	●	●				
Market segmentation		●	●			●		●		
Market share data	●	●	●	●	●	●		●	●	●
Participant observation				●	●					
Residential panels (lighting & appliances for MA and NY)		●	●					●		
Sales data collection/analysis	●	●	●	●		●	●	●	●	●
Shopping receipt data									●	
Survey research: market actors	●	●	●	●	●	●	●	●	●	●
Survey research: residential or C&I Customers, general population	●	●	●	●	●	●		●	●	●
Web-scraping/bibliometrics								●		

*Experience covered by other NMR staff

TOM MAULDIN

Executive Vice President

Tom will serve as an Advisor for NEEA projects. Tom is the Executive Vice President at NMR with over 20 years of experience working with energy-efficiency programs. He has extensive experience in designing, implementing, administering, and evaluating commercial, industrial, and residential energy-efficiency programs. His experience with the evaluation of such programs includes impact evaluation, process evaluation, and market analysis. Tom has a Master of Science in Ecology and Environmental Sciences.

WORK EXPERIENCE

2004 – Present **Executive Vice President, NMR Group, Inc.,** Somerville, MA

1998 – 2004 **Project Manager, DNV GL (formerly KEMA-XENERGY),** Burlington, MA

ILLUSTRATIVE PROJECTS

Principal in Charge. Residential—Baseline Study. For the Vermont Department of Public Service, led three rounds of baseline studies of the existing homes and new construction markets in Vermont. These studies included comprehensive onsite inspections of hundreds of homes, telephone surveys with homeowners, and in-depth interviews with builders, HVAC contractors, and retailers.

Project Manager. Residential—Lighting. For Consumers Energy, led the evaluation of the ENERGY STAR Lighting program since 2009. Studies include a benchmarking and best practices study of lighting programs, a delphi panel to estimate the net-to-gross ratio, focus groups of residential customers, telephone surveys and onsite visits with households, and interviews with program staff, manufacturers, retailers, and industry experts.

Project Manager. Commercial & Industrial. For the Massachusetts program administrators, led market characterization studies of the commercial gas boiler market and the chain and franchise market, which entailed a literature review, data analysis, in-depth interviews with energy managers, and an online forum with boiler manufacturers.

Principal in Charge. Residential—Appliances. For Efficiency Maine, led the process and impact evaluation of the ENERGY STAR Appliance Rebate Program. The process evaluation included in-depth telephone interviews with staff and participating retailers. The impact evaluation included telephone surveys with participating customers and on-site visits to homes.

SELECTED PRESENTATIONS AND PUBLICATIONS

‘Leveraging Home Energy Scores in a Residential Baseline Study’. Proceedings of the 2017 International Energy Program Evaluation Conference, Baltimore, MD. August 2017 (with Brian Cotterill).

‘How Upstream Lighting Programs Are Affecting Markets for Standard CFLs in the U.S.: Lessons from Michigan’. Proceedings of the 2014 International Energy Policies & Programmes Evaluation Conference, Berlin, Germany. September 2014 (with N. Wobus, J. Steiner, C. McDonald, J. Meurice, and A. Jaworoski).

(617) 284-6230 x8 tmauldin@nmrgroupinc.com S. Portland, ME

ROHIT VAIDYA

Vice President

Rohit will serve as an Advisor for NEEA Projects. Rohit is the Vice President at NMR with over 25 years of experience working with energy-efficiency programs. He has conducted process, market, and impact evaluations of the full spectrum of residential and commercial energy-efficiency programs in jurisdictions ranging from California to Nova Scotia. Rohit received his B.A. degree in Economics & Mathematics from the University of Delhi, India; he has completed work toward an M.A.in Sociology at Columbia University, New York.

WORK EXPERIENCE

2008 – Present **Vice President, NMR Group, Inc.,** Somerville, MA

2005 – 2008 **Vice President, Health Focus International**, St. Petersburg, Florida

ILLUSTRATIVE PROJECTS

Project Director. Electric Program Investment Charge (EPIC) Program—Process Evaluation. For the California Public Utilities Commission, under subcontract to Evergreen Economics, helped direct a theory-driven evaluation of a research, development and demonstration (RD&D) program that funds a broad portfolio of innovations that seek to advance the frontiers of energy science and technology.

Project Director. Commercial Building Benchmarking—Process Evaluation. For the California Public Utilities Commission, designed and directed a study to assess effectiveness of utility support for benchmarking commercial buildings with ENERGY STAR Portfolio Manager.

Project Director. Opportunity for Migrating Program Upstream. For National Grid New York, directed a study to assess moving a downstream heating and water heating program to a midstream intervention.

Project Director. Building Performance Institute (BPI) Accreditation and Certification—Value Assessment. For NYSERDA**.** an assessment of the value of Building Performance Institute (BPI) company accreditation and contractor certification as it pertains to use of the BPI platform for NYSERDA programs.

Project Director. Smart Thermostat Research. For Consolidated Edison, under subcontract to Cadmus, conducted research to understand market and savings opportunities for a smart thermostat program.

Project Manager. Market Research of Designing an Energy Efficiency Program for Multi-Family Buildings. For the Massachusetts program administrators, designed and directed research based on a literature review, focus groups and IDIs with multi-family landlords, developers, and program administrators.

Consumer & Business Segmentation Studies. Conducted multiple national and international segmentation studies ranging from segmentations of overall consumers and businesses to focused segmentations for specific product areas, e.g., energy, health, wellness, & sustainability, credit cards, etc.

SELECTED PRESENTATIONS AND PUBLICATIONS

“Rethinking Multifamily Energy Efficiency Programs and Services: A Program Design Study in Massachusetts,” IEPEC Conference, August 2011.

(617) 284-6230 x14 rvaidya@nmrgroupinc.com Tampa, FL

LISA WILSON-WRIGHT

Director

Lisa will serve as a Project Manager for NEEA projects. Lisa is a Director at NMR with 15 years of experience working with energy-efficiency programs. She has expertise in assessing energy-efficiency measure markets and in evaluating residential energy-efficiency programs. Lisa specializes in research and sample designs and quantitative analyses. Her experience includes impact evaluation, process evaluation, and market analysis. Lisa has a Ph.D. in Sociology from the University of Wisconsin – Madison.

WORK EXPERIENCE

2003 – **Present**	**Director, NMR Group, Inc.,** Somerville, MA
2002 – **2003**	**Post-doctoral Fellow, Watershed Research and Training Center,** Hayfork, CA

ILLUSTRATIVE PROJECTS

Project Manager. Residential—Market Transformation. For the Massachusetts ENERGY STAR Appliances Program Sponsors, developed regression models to explain market share of energy-efficient appliances in Massachusetts and numerous states across the nation. Assessed the impact of past and contemporaneous programs on market penetration, energy savings, and utilities' budgets. Conducted canonical correlation analysis to identify the across-appliance effects of appliance promotions.

Director. Residential—Process, Impact, and Net-to-Gross Evaluation. For the Massachusetts Program Administrators and Energy Efficiency Advisory Council Consultants, managed analysis and reporting of surveys of program participants who purchased rebated advanced power strips, temperature sensitive showerheads, dryers, dehumidifiers, and room air cleaners. Survey results were used to estimate in-service rates, short-term retention, free-ridership, and spillover rates and to calculate net-to-gross ratios. The surveys also explored customer satisfaction and installation experiences.

Director. Residential—Market Assessment. Directed market assessments and characterizations, as well as process, impact, and net-to-gross evaluations of residential lighting programs for various clients across the United States. Spanning multiple years (2009 to present), methods used in the evaluations included telephone, web, and onsite surveys; supplier interviews; shelf-stocking surveys; market adoption modeling; demand elasticity modeling; web scraping; and point-of-sale data analysis. Research questions included the impact of changing federal standards and ENERGY STAR specifications on market adoption, tracking the adoption of light emitting diodes from their emergence to wide spread consumer acceptance, and predicting the impacts of market change and program intervention strategies on market share and program savings.

SELECTED PRESENTATIONS AND PUBLICATIONS

"Chill the Bubbly and Pop the Cork? Have Lighting Programs Transformed the Market?" Served as a panelist at the International Energy Program Evaluation Conference in Baltimore, MD, August 2017. With David Barclay.

(617) 284-6230 x15 lwilson-wright@nmrgroupinc.com Somerville, MA

MONICA NEVIUS

Director

Monica will serve as a Project Manager for NEEA projects. She has 20 years of experience in efficiency program market research and evaluation. Her experience includes designing and managing market characterization and assessment studies of business and consumer electronics and lighting, customer journey mapping, and assessing understanding and practices around building benchmarking and residential lighting and thermostat use. She is on the IEPEC planning committee and chaired the 2017 conference. Monica holds a PhD in Sociology from the University of Wisconsin.

WORK EXPERIENCE

2011 – Present **Director, NMR Group, Inc.,** Somerville, MA

2001 – 2011 **Consortium for Energy Efficiency,** Boston, MA

ILLUSTRATIVE PROJECTS

Project Director. Residential—Central Air Conditioning Market Research & Process Evaluation. For the Connecticut Energy Efficiency Board, designed and managed a study to understand how customers decide whether to take advantage of CAC rebates or financing and how to encourage unit early replacement.

Project Director. Commercial, Residential, Industrial—HVAC Market Insight Panel. For the Massachusetts Electric & Gas Program Administrators, planned and led recruitment of HVAC manufacturers and their representatives for a panel to supply insights about HVAC equipment markets. Designed and led two annual rounds of research with panelists.

Project Director. Business & Residential—Consumer Electronics Potential Qualitative Research Study. For the Massachusetts Electric Utilities, managed a study to identify factors affecting energy efficiency of consumer electronics products that could be addressed through program activities, including the potential for efficiency improvements resulting from user behavior, technology advancements in product components, or general efficiency measures.

Project Director. Residential—Lighting Market Characterization. For NYSERDA, designed and conducted a characterization of the New York residential lighting market.

Project Director. Commercial—Statewide Benchmarking Process Evaluation. For the California Public Utilities Commission, designed and managed process evaluation of the commercial building benchmarking initiatives of four California IOUs. This included assessing use and perceptions of operational benchmarking by large commercial customers.

SELECTED PRESENTATIONS AND PUBLICATIONS

“Consumer Understanding of Key Lighting Facts and Implications for Energy Savings.” ACEEE Summer Study on Energy Efficiency in Buildings, August 2012 (primary author).

“Progress Towards Loyalty: Trends in ENERGY STAR Awareness and Brand Equity Among U.S. Households, 2000-2008.” IEPEC Conference, August 2009 (primary author).

(617) 284-6230 x22 mnevius@nmrgroupinc.com Somerville, MA

ALYSSA NA'IM

Senior Project Manager

Alyssa will serve as a Task Lead for NEEA projects. Alyssa is a Senior Project Manager at NMR with over five years of experience working with energy-efficiency programs. She has managed and contributed to numerous process evaluations and has extensive experience leading data collection efforts, such as mixed-mode surveys with program participants and in-depth interviews with program staff, implementers, and other market actors. Alyssa has a Master's in Public Policy from Harvard's John F. Kennedy School of Government.

WORK EXPERIENCE

2013 – Present	**Senior Project Manager, NMR Group, Inc.,** Somerville, MA
2006 – 2013	**Senior Research Associate, Education Development Center,** Waltham, MA

ILLUSTRATIVE PROJECTS

Project Manager. Commercial—Small Commercial Direct Install Process Evaluation. For National Grid New York, helped manage a process evaluation designed to assess the effectiveness of the SBDI program and to identify opportunities for ongoing improvement. The evaluation involved interviews with program staff and implementers as well as a survey with program participants.

Task Lead. Home Energy Solutions-Income Eligible Program Process Evaluation. For the Connecticut Energy Efficiency Board, conducted in-depth interviews with landlords, program staff, and other stakeholders to assess progress towards program goals and objectives, explore program strengths and areas for improvement, determine and quantify non-energy impacts, and identify processes that could improve measure persistence.

Analyst. Residential—Lighting Process Evaluation. For Consumers Energy's ENERGY STAR Residential Lighting Program Administrators, conducted in-depth interviews with manufacturer and retailer program partners to identify program strengths and areas for improvement, assess perspectives on changes in the lighting market, and determine future directions for the program.

Analyst. Residential & Commercial—Market Effects Measurement Methodologies. For the Massachusetts Electric and Gas Program Administrators, reviewed program documents and interviewed program staff to develop market models and program logic models. Materials helped inform an evaluation framework to assess program market effects.

SELECTED PRESENTATIONS AND PUBLICATIONS

"Polishing a Hidden Gem: A Novel Evaluation Method for Energy Codes & Standards Programs." American Council for an Energy-Efficient Economy (ACEEE) Summer Study, August 2018.

"A Tale of Two Channels: Assessing the Effectiveness of a Commercial Small Business Direct Install Program." International Energy Program Evaluation Conference (IEPEC), August 2017.

"How Abraham Lincoln Can Improve Your Survey: The Costs and Implications of Offering an Incentive and Mixed-Mode Survey." International Energy Program Evaluation Conference (IEPEC), August 2015.

(617) 284-6230 x43 anaim@nmrgroupinc.com Somerville, MA

JOANNE O'DONNELL

Senior Project Manager

Joanne will serve as a Task Lead for NEEA Projects. Joanne is a Senior Program Manager at NMR with over ten years of experience working with energy-efficiency programs. She has extensive experience in designing, implementing, administering, and evaluating commercial, industrial, and residential energy-efficiency programs. Her experience with the evaluation of such programs includes impact evaluation, process evaluation, and market analysis. Joanne has a Master's Degree in Energy and Environmental Analysis from Boston University.

WORK EXPERIENCE

2013 – Present	**Senior Project Manager, NMR Group, Inc.,** Somerville, MA
2012 – 2013	**Project Analyst, Opinion Dynamics Corporation,** Waltham, MA
2006 – 2012	**Program Manager, Consortium for Energy Efficiency,** Boston, MA

ILLUSTRATIVE PROJECTS

Project Manager. Commercial and Industrial—Process and Net-to-Gross Analysis. For the Independent Electric System Operator (IESO), served as project manager for the Conservation First Framework Business Programs. Estimated net-to-gross ratios and performed process evaluations as part of a five-year contract. Surveys and interviews designed for and performed with participants and program delivery partners (contractors, builders, developers, distributors, auditors, architects, engineers) to better understand market readiness and program implementation challenges.

Task Lead. Commercial and Industrial—Market Characterization. For the Vermont Program Administrators, served as a project manager for a market characterization of the commercial lighting and HVAC markets in Vermont. Conducted market actor interviews with HVAC designers and specifiers, lighting designers and distributors, and commercial building customers and performed a process and insights survey with businesses. Study findings informed program planning and identified effective program design and implementation strategies.

Task Lead. Commercial and Industrial—Market Characterization. For the Massachusetts program administrators, served as project manager for a market characterization study of commercial gas boilers in Massachusetts. Lead the development and implementation of a manufacturer interviews, performed an in-depth review of federal rulemaking proceedings, and helped facilitate an online roundtable discussion with manufacturers. Report findings provided program administrators with a deeper understanding of the rate of change in the current baseline efficiency level of commercial boilers in Massachusetts.

SELECTED PRESENTATIONS AND PUBLICATIONS

O'Donnell, Joanne. 2012. "Boiling Down Complexity: Innovative Program Approaches to Optimize Efficient Commercial Boiler Systems." Prepared on behalf of the Consortium for Energy Efficiency and published in the American Council for an Energy Efficiency Economy 2012 Summer Study Proceedings.

Rodgers, Kara, and Joanne O'Donnell. 2010. "Working Together to Transform the Market for Water Heating." Prepared on behalf of the Consortium for Energy Efficiency and published in the American Council for an Energy Efficient Economy 2010 Summer Study Proceedings.

(617) 284-6230 x41 jodonnell@nmrgroupinc.com New York, NY

RUSSELL M. MEYER

Senior Quantitative Analyst

Russell will serve as a Task Lead for NEEA projects. Russell is a Senior Quantitative Analyst at NMR with over ten years of experience working with energy-efficiency programs. He has broad experience in econometric and economic evaluation of energy-efficiency programs in the residential and transportation sectors. He has been a primary analyst on efficiency impact evaluation projects for clients in numerous jurisdictions. Russell has a Ph.D. in Engineering and Public Policy from Carnegie Mellon University.

WORK EXPERIENCE

2015 – Present **Senior Quantitative Analyst, NMR Group, Inc.,** Los Angeles, CA

2011 – 2014 **Steinbrenner U.S. Environmental Sustainability Fellow, Carnegie Mellon University,** Pittsburgh, PA

ILLUSTRATIVE PROJECTS

Lead Analyst. Residential—Demand Elasticity Modeling of Efficient Lighting Products. Led analysis for estimating the price elasticity of demand for program supported efficient lighting products. Method employed econometric estimation using bulb invoice data from program participating retailers over a 12-month period. Modeled elasticity estimate was then used to generate counterfactual estimate of sales volume in the absence of program incentives in order to characterize the free-ridership associated with program sales.

Task Lead. Residential—Customer In-Store Intercept Survey of Upstream Lighting Product Purchases. Task lead and primary analyst for a survey of customers purchasing program supported efficient lighting products within a utility service territory. Objectives of the study were to develop estimates of leakage, cross-sector sales, free-ridership, spillover, and a net-to-gross factor for use in program evaluation. Survey analysis included a geographic analysis of interview stores relative to the universe of program participating locations and developing a sensitivity analysis for various weighting factors.

Analyst. Residential—Massachusetts HVAC NTG Market Effects. Provided sampling and response weighting design for a stratified survey of program participating HVAC contractors—including finite population correction factors based on contractor share of program participation. Survey contributed to an assessment of program retrospective one-year net-to-gross (NTG) ratios for HVAC equipment.

SELECTED PRESENTATIONS AND PUBLICATIONS

"Association between residential energy efficiency rebates and increased consumption in California," *submitted to* Environmental Science and Technology, 2018.

"All the Lights We Cannot See: Estimating the Distribution of Upstream Lighting Program Bulbs," IEPEC Conference, 2017. Baltimore, MD.

"Do Low-Income Electricity Subsidies Change Peak Consumption Behavior," IEPEC Conference, 2017. Baltimore, MD.

(617) 284-6230 x44 rmeyer@nmrgroupinc.com Los Angeles, CA

MELISSA MEEK

Research Analyst

Melissa will serve as a Data Analyst for NEEA projects. Melissa is a Research Analyst at NMR with nearly three years of experience working with energy-efficiency programs. She has extensive experience with dataset management, quantitative analysis, in-depth interviewing, and data tools, including web-scraping. Her evaluation experience includes impact evaluation, process evaluation, and market analysis. Melissa has an M.A. in International Relations.

WORK EXPERIENCE

2016 – Present **Research Analyst, NMR Group, Inc.,** Somerville, MA

2013 – 2016 **Research Associate, Massachusetts Institute of Technology,** Cambridge, MA

ILLUSTRATIVE PROJECTS

Lead Analyst. Residential—Lighting Evaluation. For the Massachusetts program administrators, contributed extensively to the 2015-16, 2016-17, and 2017-18 Lighting Market Assessment Consumer Survey and On-site Saturation studies, including analyzing panel data, recent purchases, and the exploration of light bulb replacement behavior based on demographic factors. Built code to scrape websites of retailers where study participants purchase energy-efficient light bulbs. Prepared data for analysis of cost and availability of efficient vs. non-efficient bulbs in study locations.

Analyst. Commercial—Process and Impact Lighting Evaluation. For Xcel Energy, interviewed trade allies about their experience with small business lighting programs in Colorado and Minnesota. Estimated net-to-gross ratios and used the results of program participant and non-participant end-user, trade ally, and vendor telephone surveys to determine free-ridership and spillover values for commercial lighting programs.

Analyst. Commercial—Lighting Evaluation. For Vermont sponsors, interviewed lighting market actors, including distributors, architects, retailers and designers, about their experience with LEDs and lighting controls. Analyzed survey data from commercial business owners. Utilized data from responses to analyze support for market transformation.

Lead Analyst. Residential—Marketplace Products Update. For National Grid New York, used web-scraping tools to systematically collect data on pricing and features for appliances available at major retailers and energy-efficient products available through the National Grid Marketplace. Utilized the data to develop a snapshot of the market and study trends in pricing, features, and ENERGY STAR status.

Analyst. Commercial and Industrial—Business Program Evaluation. For the Independent Electric System Operators (IESO), conducted in-depth interviews with business owners to evaluate the Small Business Lighting and Retrofit programs.

SELECTED PRESENTATIONS AND PUBLICATIONS

"How the Other Half Lights: An Analysis of Purchase and Installation Demographic Patterns," International Energy Professionals Evaluation Conference (IEPEC), August 2017. Baltimore, MD. (Poster presentation)

(617) 284-6230 x37 mmeek@nmrgroupinc.com Stratford, CT

JAYNE PIEPENBURG

Research Associate II

Jayne will serve as a Data Analyst for NEEA projects. Jayne is a Research Associate II at NMR with over two years of experience working with energy-efficiency programs. She has experience implementing descriptive and inferential statistical analysis, as well as with in-depth interviewing, dataset management, professional writing, and statistical programming. Jayne has an MPA in Environmental Policy and Policy Analysis from Indiana University.

WORK EXPERIENCE

2016 – Present	**Research Associate II, NMR Group, Inc.,** Somerville, MA
2014 – 2016	**Project Research and Outreach Associate, Union of Concerned Scientists,** Cambridge, MA

ILLUSTRATIVE PROJECTS

Analyst. Commercial and Industrial—Residential HVAC Market Share. For the Massachusetts program administrators, estimating market share and unit sales of residential HVAC equipment in Massachusetts as part of a Cross-Cutting Market Effects/Net-to-Gross evaluation.

Analyst. Commercial and Industrial—Lighting Controls and Market Effects. For the Massachusetts program administrators, evaluated lighting fixture and controls markets via a survey of lighting contractors in the state.

Analyst. Residential—Lighting Decision-Making. For the Massachusetts program administrators, evaluated novel consumer decision-making survey dataset to examine behavioral motivations for consumer lighting purchases to inform policymaking.

Analyst. Commercial, Residential, Industrial—Program and Pilot Net-to-Gross Analysis. For the Independent Electric Service Operator (IESO), conducted in-depth interviews and estimated net-to-gross values for several programs and pilots, including upgrades to equipment in the water and wastewater sector and smart thermostat upgrades.

Analyst. Residential—Lighting Shelf Stocking. For the Massachusetts program administrators, evaluated lighting retail shelf share to examine efficient lighting availability across store channels to inform policymaking.

SELECTED PRESENTATIONS AND PUBLICATIONS

“I Want in on That: Community-Level Policies for Unconventional Gas Development in New York,” Agricultural and Resource Economics Review, 2015, 44(2), 164-194.

“Reduction of Water Consumption and Pollution in the Corn Masa Production Process,” ASABE Annual International Meeting, July 2010. Pittsburg, PA.

(617) 284-6230 x56 jpiepenburg@nmrgroupinc.com Somerville, MA

TIM STEIS
Research Associate

Tim Steis will serve as a Data Analyst for NEEA projects. Tim is a Research Associate at NMR with over two years of experience working with energy-efficiency programs. His duties include performing descriptive qualitative and quantitative analysis, writing survey reports, and conducting energy audits in order to assess the efficiency of various residential and commercial building components. He received a B.S. in Environmental Engineering from the University of Vermont.

WORK EXPERIENCE

2016 – Present	**Research Associate, NMR Group, Inc.,** Somerville, MA
2013 – 2015	**Data Analyst Intern, Natural Gas Intelligence,** Sterling, VA

CERTIFICATIONS

Certified Home Energy Systems (HERS) Rater - RESNET

ILLUSTRATIVE PROJECTS

Analyst. Residential—New Construction Impact and Process. MidAmerican Energy, Iowa. Conducting impact and process evaluation of a residential new construction program. Tasks include conducting interviews with construction industry experts and identifying opportunities for improving the MidAmerican Residential Energy program.

Analyst, Field Data Collection. Residential—Existing Home and New Construction Baseline and Code Compliance Studies. Massachusetts, Rhode Island, Connecticut, Vermont, and Pennsylvania Sponsors. Conducting energy audits on new homes following HERS standards, including diagnostic blower door and duct blaster tests to assess the homes' energy efficiency. Analyzing results to illustrate characteristics of newly constructed residential homes and writing sections of the final report.

Analyst. Residential—New Construction Attribution Study. Massachusetts Sponsors. Contributed to a study that assesses the net savings attributable to the RNC and CCSI programs. This study is using a Delphi approach to estimate what would have happened in the absence of the programs. Tasks include client interaction, data analysis, and reporting.

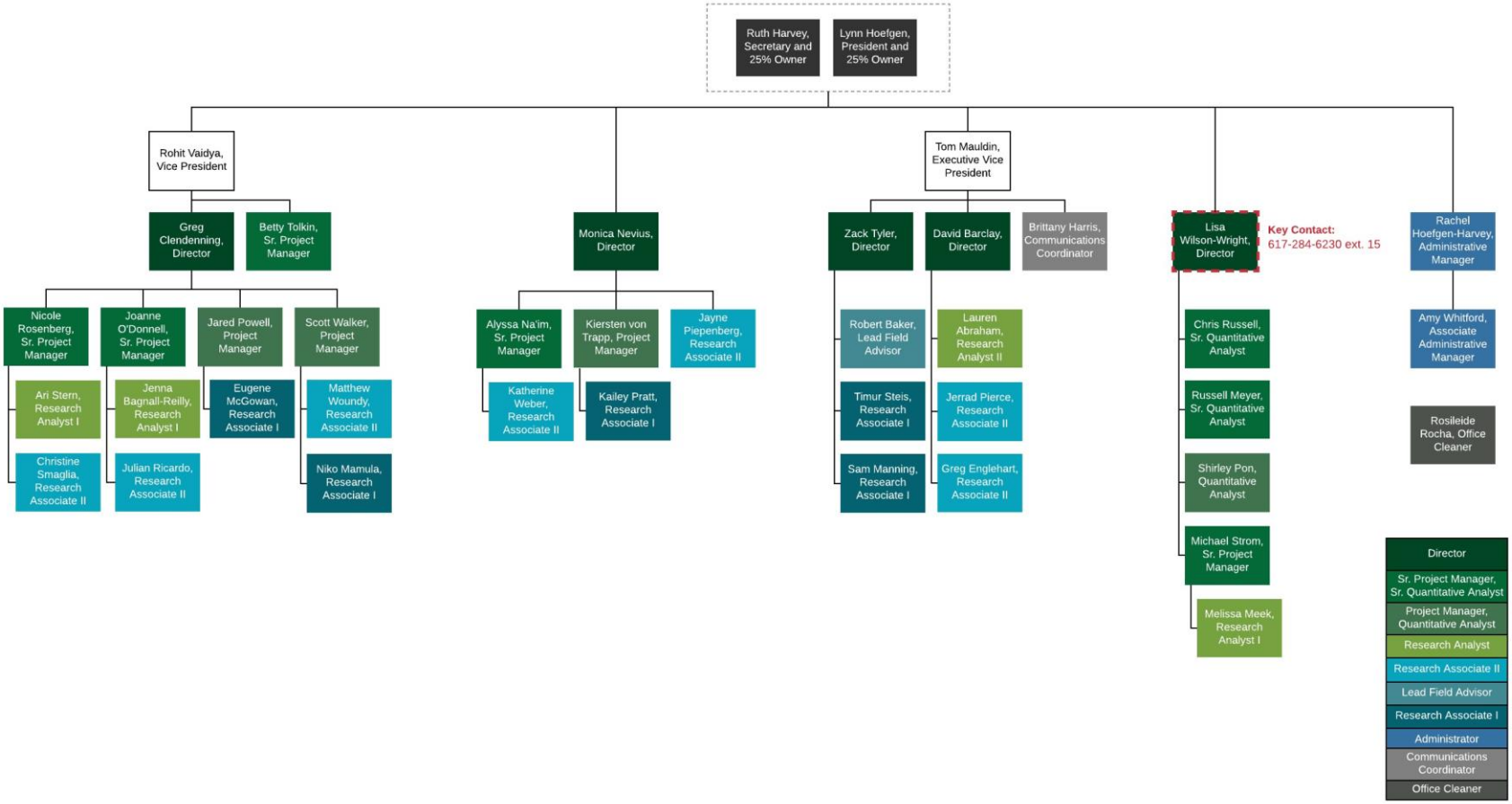
Analyst. Residential—EDC Audits, Pennsylvania PUC. Assisting with ensuring the reliability and accuracy of the EDC EE&C program savings estimates by checking that EDC data and reports are accurately calculated and show the correct TRM savings. The measures audited for savings accuracy include, HVAC equipment, water heaters, appliances, and lighting.

(617) 284-6230 x40 tsteis@nmrgroupinc.com Somerville, MA

A.1.2 Organization Chart

The organizational chart below displays NMR's reporting and hierarchical structure. We describe the company's approach to project and account management in Section A.2.2.

Figure 1: NMR Organizational Chart



A.1.3 Rates

Table 3: NMR Rates

Position	2018	2019	2020
President	$278	$286	$295
Vice President, Director	$243	$250	$258
Senior Project Manager, Senior Quantitative Analyst	$225	$232	$239
Project Manager, Quantitative Analyst, Research Analyst II	$192	$198	$204
Research Analyst I, Administrative Manager or Associate	$166	$171	$176
Research Associate II, Lead Field Advisor, Communications Coordinator	$140	$144	$148
Research/Administrative Assistant, Research Associate I	$118	$122	$126
Field Technician	$78	$80	$82

A.1.4 Financial Standing

The following pages include NMR's Dun & Bradstreet report.

dun & bradstreet

CreditBuilder™

NMR GROUP, INC. - Full Company View | Saved by **Rachel Hoefgen-Harvey** | 10-10-2018

Summary

Report as of: 10-10-2018

NMR GROUP, INC.

ACTIVE | SINGLE LOCATION

Address: 50-2 Howard St, Somerville, MA, 02144, UNITED STATES

Alerts:

PAYDEX® Score	Delinquency Predictor Percentile	Financial Stress Percentile	D&B Viability Rating
80	95	65	1 3 A A

Company Profile

D-U-N-S
05-251-1131

Mailing Address
United States

Annual Sales
US$ 9,940,597 ()

Legal Form
Corporation (US)

Telephone
(617) 284-6230

Employees
30*

Ownership
Not publicly traded

Website
www.nmrgroupinc.com

Age (Year Started)
17 years (2001)

Named Principal
Lynn Hoefgen, PRES

Line of Business
Commercial nonphysical research

Risk Assessment

PAYDEX® Score

80

Low Risk (100) High Risk (0)

Pays On Time

Past 24 Months

Low

High

Delinquency Predictor Percentile

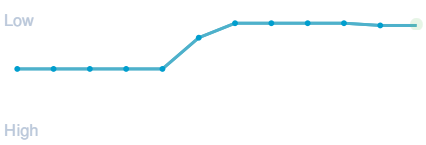
95

Low Risk (100) High Risk (1)

Company's risk level is: LOW

Probability of delinquency over the next 12 months: **1.16%**

Past 12 Months



Financial Stress Percentile

65

Low Risk (100) High Risk (1)

Company's risk level is: MODERATE

Probability of failure over the next 12 months: **0.15%**

Past 12 Months

Supplier Evaluation Risk Rating

2

Low Risk (1) High Risk (9)

Company's risk level is: LOW

Low risk of supplier experiencing severe financial stress over the next 12 months

Past 12 Months

D&B Rating

Current Rating as of 03-27-2018

Financial Strength

3A : US$1,000,000 to US$9,999,999 in Net Worth or Equity

Risk Indicator

3 :

Moderate Risk

Previous Rating

:

Risk Indicator

3 : Moderate Risk

D&B Viability Rating

Portfolio Comparison Score

3

Low Risk (1) High Risk (9)

Company's risk level is: LOW

Probability that a company will go out of business, become dormant/inactive, or file for bankruptcy/insolvency within the next 12 months: **0.2%**

D&B Guidance

Overall Business Risk

LOW	LOW-MODERATE	MODERATE	MODERATE-HIGH	HIGH

Dun & Bradstreet Thinks...

- Overall assessment of this company: **STABLE CONDITION**
- Based on the perceived sustainability of this company: **LIKELIHOOD OF CONTINUED OPERATIONS**
- Based on the payment behavior of this company: **VERY-LOW-POTENTIAL-FOR-SEVERELY-DELINQUENT-PAYMENTS**

Maximum Credit Recommendation

US$ 135,000

The recommended limit is based on a low probability of severe delinquency.

Legal Events

Events	Occurrences	Last Filed
Bankruptcies	0	-
Judgments	0	-
Liens	0	-
Suits	0	-
UCC	10	05-18-2018

Trade Payments

Highest Past Due

US$ 0

Highest Now Owing	Total Trade Experiences	Largest High Credit	Average High Credit
US$ 85,000	**11**	**US$ 85,000**	**US$ 28,750**

Ownership

This company is a **Headquarter**.

Total Members in Family Tree - 1

Subsidiaries

Branches

0

0

Peers

Peer Name	PAYDEX®	Financial Stress Score	Delinquency Predictor Score	Supplier Eval. Risk Rating	D&B Rating	D&B Viability Rating	Maximum Credit Recommendation	# of Inquiries in 12 mos
ILLUME ADVISING LLC	80	1507	582	2	2R	32BK	34000	24
Evergreen Economics	-	-	-	2	DS	undetermined		0
OPINION DYNAMICS CORPORATION OF FLORIDA, INC.	70	1491	492	2	-	21BG	75000	56
RESEARCH INTO ACTION, INC.	80	1487	548	2	1R	33BG	56500	11

Financial Overview

This company has not provided financial statements to D&B.

Inquiries

12 Month Summary

Total number of Inquiries	Unique Customers
8	5

Risk Assessment

PAYDEX® Score

Based on 24 months of data

80

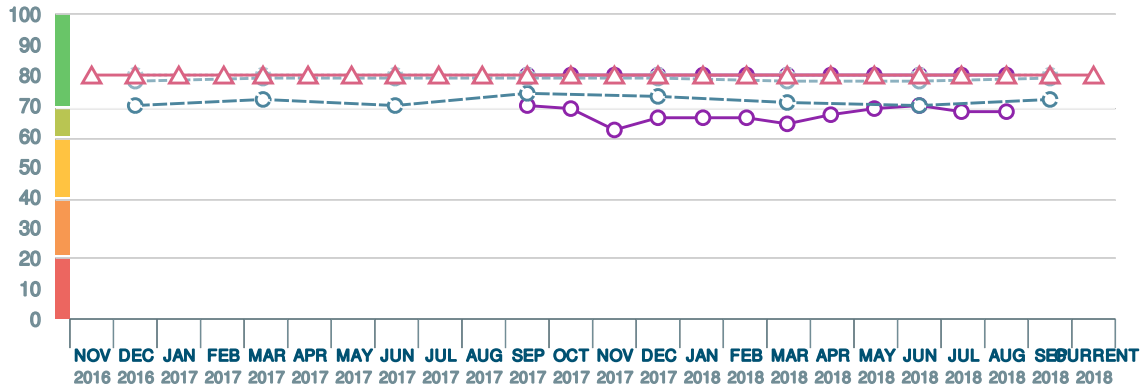
Low Risk (100) High Risk (1)

Based on a D&B PAYDEX® Score of 80

Risk of Slow Pay
Low

Payment Behavior
Pays on time

Business and Industry Trends



PAYDEX® Score

Industry Median Risk

Industry Upper Risk

Industry Lower Risk

OPINION DYNAMICS C...

RESEARCH INTO ACTI...

ILLUME ADVISING LLC

Understand My Score

Payment History

Total Last 24 Months: 11

View All

Date of Experience	Payment Status	Selling Terms	High Credit (US$)	Now Owes (US$)	Past Due (US$)	Months Since Last Sale
10/18	Pays Promptly	N30	85,000	85,000	0	1
09/18	-	Cash account	250	0	0	Between 6 and 12 Months
09/18	-	Cash account	250	0	0	Between 2 and 3 Months
09/18	-	Cash account	500	0	0	1
09/18	-	Cash account	500	0	0	Between 4 and 5 Months

Keys

PAYDEX®	Payment Practices
100	Anticipate
90	Discount
80	Prompt
70	15 Days Beyond Terms
60	22 Days Beyond Terms
50	30 Days Beyond Terms
40	60 Days Beyond Terms
30	90 Days Beyond Terms

20	120 Days Beyond Terms
1-19	Over 120 Days Beyond Terms
UN	Unavailable

Delinquency Predictor Score

95

Low Risk (100) High Risk (1)

Based on a D&B Delinquency Predictor Percentile of 95

Score
598 --

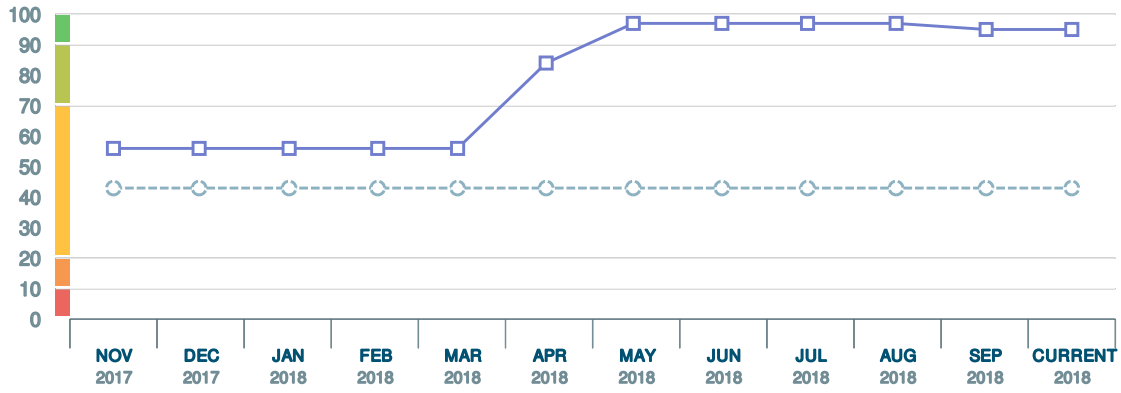
Class
1

Factors Affecting Your Score:

- Higher risk industry based on delinquency rates for this industry

Level of risk	Probabilty of Delinquency	Compared to Businesses in D&B Database
Low	1.16%	10.2%

Business and Industry Trends



Financial Stress Score

65

Low Risk (100) High Risk (1)

Based on a D&B Financial Stress Percentile of 65

Score
1504 --

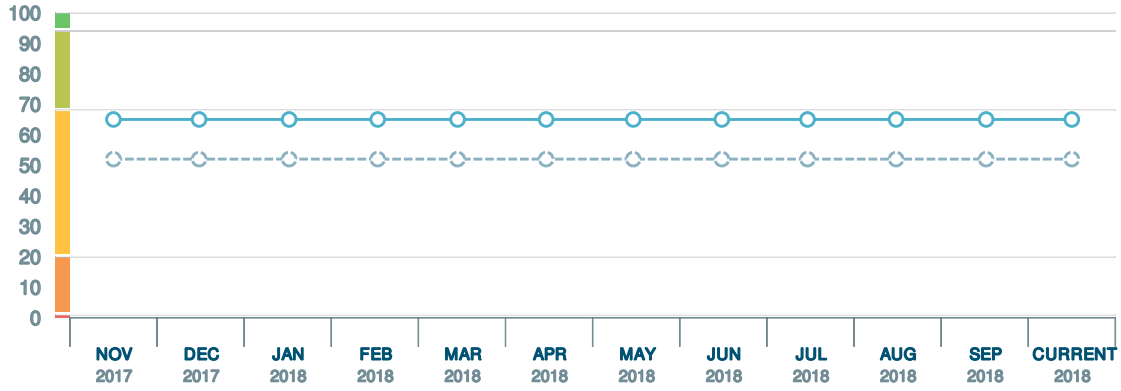
Class
3

Factors Affecting Your Score:

- Low proportion of satisfactory payment experiences to total payment experiences
- Limited number of comparative financial statements

Level of risk	Probability of Failure	Average Probability of Failure for Businesses in D&B Database
Moderate	0.15%	0.48%

Business and Industry Trends



Financial Stress Score

Industry Median Risk

OPINION DYNAMICS C...

RESEARCH INTO ACTI...

ILLUME ADVISING LLC

Supplier Evaluation Risk Rating

Based on 24 months of data

2

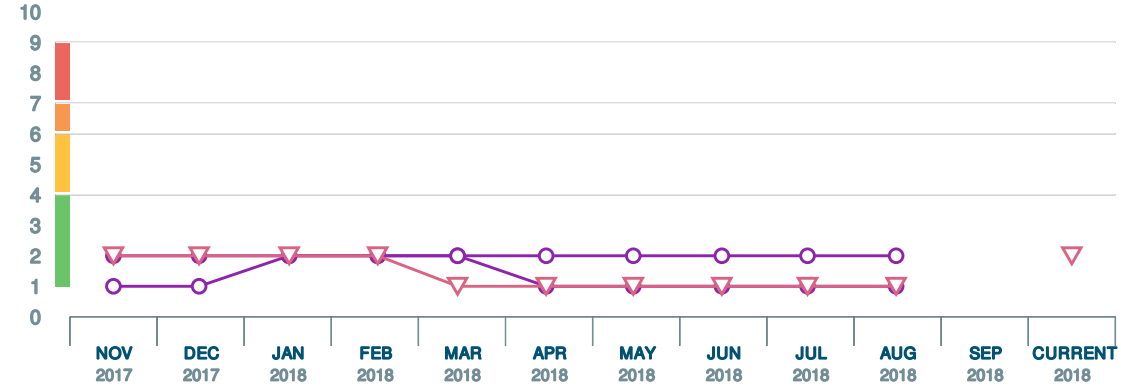
Low Risk (1)

High Risk (9)

Factors Affecting Your Score:

- Business belongs to an industry with above average risk of ceasing operations or becoming inactive
- Total Liabilities to Net Worth influencing the score

Business and Industry Trends



Supplier Evaluation Sc...

OPINION DYNAMICS C...

RESEARCH INTO ACTI...

ILLUME ADVISING LLC

Maximum Credit Recommendation

Overall Business Risk

LOW	LOW-MODERATE	MODERATE	MODERATE-HIGH	HIGH

Dun & Bradstreet Thinks...

- Overall assessment of this company: **STABLE CONDITION**
- Based on the perceived sustainability of this company: **LIKELIHOOD OF CONTINUED OPERATIONS**
- Based on the payment behavior of this company: **VERY-LOW-POTENTIAL-FOR-SEVERELY-DELINQUENT-PAYMENTS**

Maximum Credit Recommendation

US$ 135,000

The recommended limit is based on a low probability of severe delinquency.

D&B Rating

Current Rating as of 03-27-2018

Financial Strength

3A : US$1,000,000 to US$9,999,999 in Net Worth or Equity

Risk Indicator

3 :

Moderate Risk

Previous Rating

:

Risk Indicator

3 : Moderate Risk

D&B Viability Rating

Portfolio Comparison Score

3

Low Risk (1) High Risk (9)

Level of risk
Low

Rating Confidence Level
Robust Predictions

Probability of becoming no longer viable
0.2%

Percentage of businesses ranked with this score
15%

Average probability of becoming no longer viable
0.6%

Viability Score

1

Low Risk(1) High Risk (9)

Level of risk
Low

Probability of becoming no longer viable
0.2%

Percentage of businesses ranked with this score
14%

Average probability of becoming no longer viable
0.3%

Data Depth Indicator

- Rich Firmographics
- Extensive Commercial Trading Activity

A

Predictive (A) Descriptive (G)

- Comprehensive Financial Attributes

Company Profile

	Financial Data	Trade Payments	Company Size	Years in Business
A	Not Available	Available	Large	Established

Compared to ALL US Businesses within the D&B Database:

- Financial Data : Not Available
- Trade Payments : Available: 3+Trade
- Company Size : Large: Employees:50+ or Sales: $500K+
- Years in Business : Established: 5+

Trade Payments

Trade Payments Summary

Overall Payment Behavior
0
Pays on time

Highest Now Owing:
US$ 85,000

% of Trade Within Terms
100%

Total Trade Experiences:
11
Largest High Credit:
US$ 85,000
Average High Credit:
US$ 28,750

Highest Past Due
US$ 0

Total Unfavorable Comments :
0
Largest High Credit:
US$ 0

Total Placed in Collections:
0
Largest High Credit:
US$ 0

Trade Payments By Credit Extended

Dispute Payments

Range of Credit Extended (US$)	Number of Payment Experiences	% Within Terms
100,000 -	0	0
50,000 - 99,999	1	100
15,000 - 49,999	0	0
5,000 - 14,999	0	0
1,000 - 4,999	1	100
- 999	1	100

Trade Payments By Industry

Industry Category	Number of Payment Experiences	Largest High Credit (US$)	% Within Terms (Expand to View)
73 - Business Services	1	1,000	
7379 - Misc computer service	1	1,000	100

87 - Engineering Accounting Research Management and Related Services	1	85,000	
8732 - Nonphysical research	1	85,000	100
96 - Administration of Economic Programs	1	250	
9651 - Reg misc coml sector	1	250	100

Trade Lines

Date of Experience	Payment Status	Selling Terms	High Credit (US$)	Now Owes (US$)	Past Due (US$)	Months Since Last Sale
10/18	Pays Promptly	N30	85,000	85,000	0	1
09/18	-	Cash account	250	0	0	Between 6 and 12 Months
09/18	-	Cash account	250	0	0	Between 2 and 3 Months
09/18	-	Cash account	500	0	0	1
09/18	-	Cash account	500	0	0	Between 4 and 5 Months
08/18	satisfactory	-	250	-	-	1
08/18	Pays Promptly	-	1,000	0	0	Between 6 and 12 Months
06/18	-	Cash account	50	-	-	1
04/18	-	Cash account	50	-	-	1
02/18	-	Cash account	100	-	-	1
08/17	cash own option	Cash account	100	-	-	1

Legal Events

The following Public Filing data is for information purposes only and is not the official record. Certified copies can only be obtained from the official source.

Judgments	Liens	Suits	UCC Filings
0	0	0	10
Latest Filing: -	Latest Filing: -	Latest Filing: -	Latest Filing: 05-18-2018

Events

UCC Filing - Continuation

Dispute UCC Filing

Filing Date	05-18-2018
Filing Number	201846530890
Received Date	05-21-2018
Original Filing Date	10-20-2008
Original Filing Number	200869004250
Secured Party	CITIZENS BANK, N.A., PROVIDENCE, RI
Secured Party	RBS CITIZENS, N.A., PROVIDENCE, RI
Debtors	NMR GROUP, INC.
Debtors	and OTHERS
Filing Office	SECRETARY OF STATE/UCC DIVISION, BOSTON, MA

UCC Filing - Continuation

Filing Date	04-19-2017
Filing Number	201736190340
Received Date	04-24-2017
Original Filing Date	09-24-2012
Original Filing Number	201298663830
Secured Party	RBS CITIZENS, N.A., PROVIDENCE, RI
Debtors	NMR GROUP, INC.
Filing Office	SECRETARY OF STATE/UCC DIVISION, BOSTON, MA

UCC Filing - Continuation

Filing Date	04-14-2015
Filing Number	201519134970
Received Date	04-20-2015
Original Filing Date	09-14-2010
Original Filing Number	201082765580
Secured Party	RBS CITIZENS, N.A., PROVIDENCE, RI
Debtors	NMR GROUP INC
Debtors	and OTHERS
Filing Office	SECRETARY OF STATE/UCC DIVISION, BOSTON, MA

UCC Filing - Amendment

Filing Date	04-09-2015
Filing Number	201519064880
Received Date	05-08-2015
Original Filing Date	09-14-2010
Original Filing Number	201082765580
Secured Party	RBS CITIZENS, N.A., PROVIDENCE, RI
Debtors	NMR GROUP INC
Debtors	and OTHERS
Filing Office	SECRETARY OF STATE/UCC DIVISION, BOSTON, MA

UCC Filing - Amendment

Filing Date	01-15-2015
Filing Number	201517242730
Received Date	02-06-2015
Collateral	Negotiable instruments including proceeds and products - Inventory including proceeds and products - Account(s) including proceeds and products - Farm products/crops including proceeds and products - and OTHERS
Original Filing Date	10-20-2008
Original Filing Number	200869004250
Secured Party	CITIZENS BANK, N.A., PROVIDENCE, RI
Secured Party	RBS CITIZENS, N.A., PROVIDENCE, RI
Debtors	NMR GROUP, INC.
Debtors	and OTHERS
Filing Office	SECRETARY OF STATE/UCC DIVISION, BOSTON, MA

UCC Filing - Continuation

Filing Date	05-22-2013
Filing Number	201304120360
Received Date	05-27-2013
Original Filing Date	10-20-2008
Original Filing Number	200869004250
Secured Party	RBS CITIZENS, N.A., PROVIDENCE, RI
Debtors	NMR GROUP, INC.

Debtors	and OTHERS
Filing Office	SECRETARY OF STATE/UCC DIVISION, BOSTON, MA

UCC Filing - Amendment

Filing Date	05-17-2013
Filing Number	201304039400
Received Date	06-05-2013
Original Filing Date	10-20-2008
Original Filing Number	200869004250
Secured Party	RBS CITIZENS, N.A., PROVIDENCE, RI
Debtors	NMR GROUP, INC.
Debtors	and OTHERS
Filing Office	SECRETARY OF STATE/UCC DIVISION, BOSTON, MA

UCC Filing - Original

Filing Date	09-24-2012
Filing Number	201298663830
Received Date	10-02-2012
Collateral	Negotiable instruments including proceeds and products - Inventory including proceeds and products - Account(s) including proceeds and products - Farm products/crops including proceeds and products - and OTHERS
Secured Party	RBS CITIZENS, N.A., PROVIDENCE, RI
Debtors	NMR GROUP, INC.
Filing Office	SECRETARY OF STATE/UCC DIVISION, BOSTON, MA

UCC Filing - Original

Filing Date	09-14-2010
Filing Number	201082765580
Received Date	10-06-2010
Collateral	All Inventory and proceeds - All Account(s) and proceeds - All General intangibles(s) and proceeds - All Equipment and proceeds - All Chattel paper and proceeds
Secured Party	RBS CITIZENS, N.A., PROVIDENCE, RI
Debtors	NMR GROUP INC
Filing Office	SECRETARY OF STATE/UCC DIVISION, BOSTON, MA

UCC Filing - Original

Filing Date	10-20-2008
Filing Number	200869004250
Received Date	11-10-2008
Collateral	All Inventory and proceeds - All Account(s) and proceeds - All General intangibles(s) and proceeds - All Equipment and proceeds - All Chattel paper and proceeds
Secured Party	RBS CITIZENS, N.A., PROVIDENCE, RI
Debtors	NEXUS MARKET RESEARCH, INC.
Filing Office	SECRETARY OF STATE/UCC DIVISION, BOSTON, MA

Special Events

There have been no Special Events reported for your company. If you have had a change in ownership or with officers of the company, please call customer service at 800-333-0505.

Ownership

This business, NMR GROUP, INC. is not currently part of a family tree.

Company Profile

Company Overview

D-U-N-S
05-251-1131

Legal Form
Corporation (US)

Ownership
Not publicly traded

Mailing Address
United States

Telephone
(617) 284-6230

Website
www.nmrgroupinc.com

Annual Sales
US$ 9,940,597 ()

Employees
30*

Age (Year Started)
17 years (2001)

Named Principal
Lynn Hoefgen, PRES

Line of Business
Commercial nonphysical research

Business Registration

Corporate and business registrations reported by the secretary of state or other official source as of: -
This data is for informational purposes only, certification can only be obtained through the Office of the Secretary of State.

Registered Name	NMR GROUP, INC.
Corporation Type	Corporation (US)
Business Commenced On	2001

Principals

Officers

LYNN HOEFGEN, PRES
ROHIT VAIDYA, V PRES
RUTH HARVEY, V PRES

Directors

DIRECTOR(S): THE OFFICER(S)

Company Events

The following information was reported on: 10-08-2018

The Massachusetts Secretary of State's business registrations file showed that NMR Group, Inc. was registered as a Corporation on March 9, 2001.

Business started 2001. 100% of capital stock is owned by officers.

LYNN HOEFGEN born 1954. 2001-present active here. 1989-2001 employed by Opinion Dynamics Corp, Cambridge, MA.

ROHIT VAIDYA. Antecedents are unknown.

RUTH HARVEY. Antecedents are unknown.

Business address has changed from 22 Haskell St, Cambridge, MA, 02140 to 50-2 Howard St, Somerville , MA, 02144.

Business Activities And Employees

The following information was reported on: 10-08-2018

Business Information

Description	Engaged in commercial economic, sociological or educational research, specializing in market analysis or research (50%). Terms are Net 30 days. Sells to non profit organizations, commercial concerns and government. Territory : United States & Canada.
Employees	30 which includes officer(s) and 3 part-time.
Financing Status	Unsecured
Financial Condition	Fair

SIC/NAICS Information

SIC Codes	SIC Description	Percentage of Business
8732	Commercial nonphysical research	-

87320105	Market analysis or research	-

NAICS Codes	NAICS Description
541910	Marketing Research and Public Opinion Polling

Government Activity Dispute Government Activity

Activity Summary

Borrower(Dir/Guar)	No
Administrative Debt	No
Contractor	Yes
Grantee	No
Party excluded from federal program(s)	No

Possible candidate for socio-economic program consideration

8(A) Firm	Yes
Labor Surplus Area	Yes
Small Business	Yes (2018)

Financials

D&B currently has no financial information on file for this company

Inquiries

Inquiries-Summary - 12 Month

Total number of Inquiries	Unique Customers
8	5

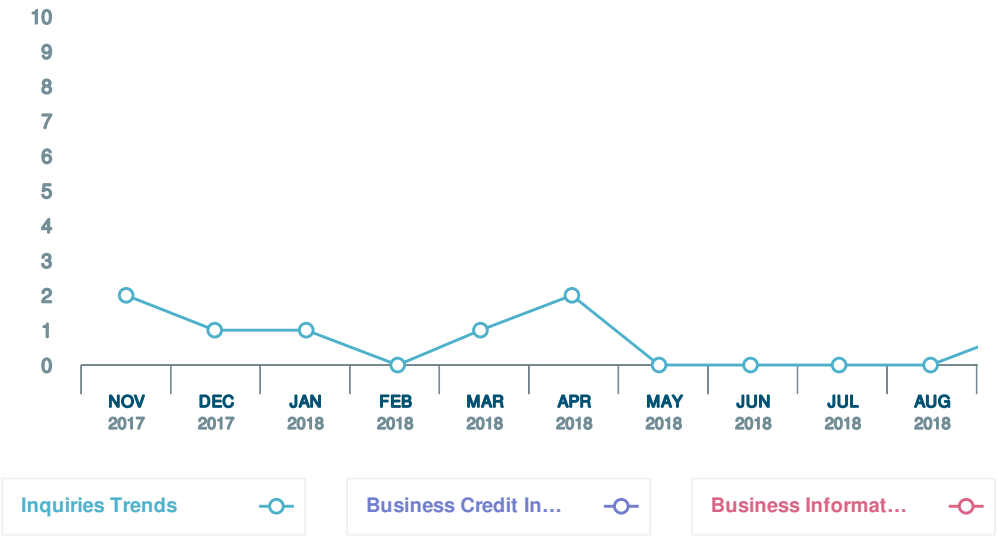
Inquiries-Summary

Over the past 12 months ending 10-2018, 8 individual requests for information on your company were received. The 8 inquiries were made by 5 unique customers indicating that some companies have inquired on your business multiple times and may be monitoring you. Of the total products purchased, 4, or 50 % came from the Finance, Insurance and Real Estate; 2, or 25 % came from the Services; 2, or 25 % came from the Public Administration;

SIC/Sector

Type Date		
SERV - Services		
- Business services, nec	D&B Risk Solution	2018-03-05
- Prepackaged software	D&B Risk Solution	2017-12-01
PUBADMIN - Public Administration		
- General government, nec	Sales & Marketing Solution	2018-09-06
- General government, nec	D&B Risk Solution	2018-04-24
FIR - Finance, Insurance and Real Estate		
- Fire, marine, and casualty insurance	D&B Risk Solution	2018-04-11
- Fire, marine, and casualty insurance	D&B Risk Solution	2018-01-23
- Insurance agents, brokers, and service	D&B Risk Solution	2017-11-15
- Insurance agents, brokers, and service	D&B Risk Solution	2017-11-15

Inquiries Trends - 12 Month



Top-Five-Inquiries

By SIC Sector

Finance, Insurance and Real Estate	4
Services	2
Public Administration	2

By Report Type

D&B Risk Solution	7
Sales & Marketing Solution	1

All-Inquiries

Industry	Total Inquiries	Last 30 Days	Last 90 Days	Last 180 Days	Last 365 Days
Finance, Insurance and Real Estate	4	0	0	0	4
Services	2	0	0	0	2
Public Administration	2	0	1	2	2

Peers Inquiries

Peers Inquiries Summary - 12 Month

Peer Name	Total inquiries	Unique Customers
RESEARCH INTO ACTION, INC.	11	5
OPINION DYNAMICS CORPORATION OF FLORIDA, INC.	56	15
Evergreen Economics	0	0
ILLUME ADVISING LLC	24	14

Peers Comparison

OPINION DYNAMICS CORPORATION OF FLORIDA, INC. **RESEARCH INTO ACTION, INC.** **Evergreen Economics**

ILLUME ADVISING LLC

Trends

Peer Name	Twelve Month Inquiries	Year over Year Inquiries
OPINION DYNAMICS CORPORATION OF FLORIDA, INC.	56	50
RESEARCH INTO ACTION, INC.	11	16
Evergreen Economics	0	0
ILLUME ADVISING LLC	24	21

A.1.5 Industry Recognition

NMR staff members were the primary authors of six papers and posters at the 2018 ACEEE Summer Study on Energy Efficiency in Buildings, and 14 papers and posters at the 2017 International Energy Program Evaluation Conference (IEPEC), the premier conference in the industry. At the 2015 IEPEC, NMR staff members were the primary authors of 13 papers and posters.

A.1.6 Corporate Qualifications

In the following pages, we have included our corporate qualifications, which further demonstrate our expertise.

Corporate Qualifications

OCTOBER 2018

NMR Group (NMR) was founded with a mission of *providing independent, high-quality evaluation and market assessment services to administrators and regulators of energy-efficiency and renewable energy programs.*

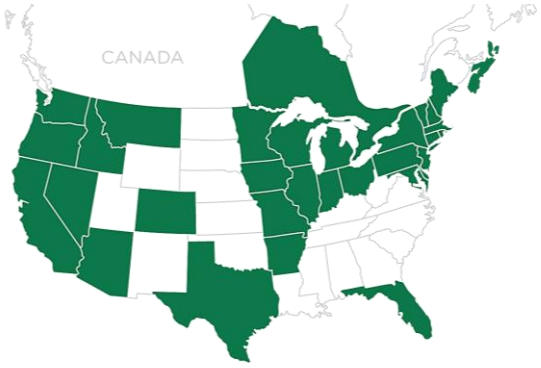
NMR provides clients with research-based information and insights to help them focus program efforts based on prevailing market structure and conditions. We measure the impacts of energy-efficiency and renewable energy programs. We provide strategic guidance for improving program design and delivery. Our services include the following:

- Process Evaluation
- Impact Evaluation
- Measurement of Market Effects and Market Transformation
- Market Characterization and Assessment.

In 2017, NMR became employee-owned through an Employee Stock Ownership Plan (ESOP). Currently, employees own 50% of the company, and our goal is to increase employee ownership to 100% by 2024.

OUR PLACE IN THE INDUSTRY

We have provided evaluation services in **fifteen of the top twenty states** for energy-efficiency policy and programs, as ranked by the American Council for an Energy-Efficient Economy in its 2016 state scorecard. Our evaluation experience spans the entire North American continent, including the shaded regions.



NMR is a mid-sized firm with an outsized presence at industry conferences. For example, we were the primary authors of 14 papers and posters at the 2017 IEPEC conference and had six papers accepted for the 2018 ACEEE Summer Study.

NMR's staff includes eight people with PhDs in fields such as economics, engineering and public policy, demography, and various social sciences; and 24 people with masters' degrees in fields including energy and environmental analysis, economics, business administration, public policy, and more.

"I hope to find that the evaluator has been there ahead of me, identifying all the threats to validity, integrating results, using sound reasoning. And NMR does that better than anyone else. NMR is the best out there, frankly."

– Evaluation Advisor to Regulators

Populations Addressed

The populations researched by NMR staff have encompassed the full spectrum of energy users and trade allies, including the following:

- Trade professionals
- Building industry professionals, including engineers and architects
- Distributors
- Manufacturer representatives
- Retailers/Retail Sales Managers
- Building managers/owners
- Consumers/residential customers
- Commercial Customers

Our Values

One of NMR's two core values is producing the highest quality work possible, which affects all our long-term and day-to-day business decisions. Our approach to quality control (QC) and improvement specifies core QC practices for all projects, as well as specific QC practices for project planning and design, project management, quantitative data collection review, quantitative data set review, quantitative data analysis review, analysis and reporting, and deliverables review. An essential part of maintaining and improving quality is effective communications with clients to make sure their needs are met. NMR's other core value is care and concern for colleagues' professional and personal welfare, a focus that has helped us achieve one of the lowest employee turnover rates in the industry. This low turnover helps quality by maintaining institutional memory of projects and programs, and by allowing us to assign truly experienced staff to lead projects.

NMR's Building Science Group

- **Conducted 19 residential baselines (single-family, multifamily, existing, new construction)**
- **Eleven Certified Home Energy Raters (HERS)**
- **One Certified Energy Manager (Association of Energy Engineers)**
- **One Certified Building Performance Institute Multifamily Building Analyst**
- **One Certified Energy Manager in Training (Association of Energy Engineers)**
- **One Certified Building Performance Institute Building Analyst**
- **One Certified Building Investigations Infrared Thermographer**

ILLUSTRATIVE PROJECTS

Statewide Evaluator, Pennsylvania Public Utilities Commission

NMR is the prime contractor leading the Statewide Evaluation Team (SWE) for the Pennsylvania Public Utilities Commission (PUC), focusing on evaluating the performance of the Energy Efficiency and Conservation program portfolios of the seven largest Electric Distribution Companies (EDCs). The SWE team has created an Evaluation Framework to guide the utility EM&V contractors in the development of data collection and sampling protocols and the proper use of the Technical Reference Manual (TRM). The SWE team also created a menu of approaches, depending on size and type of program, for verifying gross and net impacts and producing process recommendations. The SWE team reviews the evaluation methods and findings of each program and advises the PUC on whether to credit the claimed savings toward the EDC's statutory reduction targets or request revisions to the impact estimates. The SWE also develops and maintains the Pennsylvania TRM.

Massachusetts Residential Lighting, Products, and New Construction Evaluation

NMR is the prime contractor working for the Massachusetts program administrators (PAs, consisting of Berkshire Gas, Cape Light Compact, Eversource, Liberty Utilities, National Grid, NiSource, and Unitil), under the direction of the Massachusetts Energy Efficiency Advisory Committee, evaluating the following programs and initiatives with over $100 million in annual implementation and delivery budgets:

- **Residential Lighting:** NMR has been evaluating residential lighting programs in Massachusetts since 2005. The fruits of this effort have included the most comprehensive series of saturation studies available in the US; an ongoing on-site panel study showing which bulb types are replacing other bulbs; multi-method net-to-gross studies; incremental cost studies; market studies conducted among manufacturers, high-level retail buyers, and store managers; a market adoption model based on current saturation and market trends that projects likely socket share by bulb type into the future; and gross and net savings estimates. One example of our value-added service is a residential lighting hours of use study conducted in four states, which leveraged samples across states to achieve greater precision than any state could have achieved on its own.
- **Residential Products:** NMR has been evaluating the Massachusetts Products Program (now incorporated into the Lighting and Products Program) since 2002. This has involved performing a wide range of evaluation and market research activities over the course of the contract, including performing customer surveys, on-site saturation studies, process evaluations, mystery shopping, assessing program databases, tracking market share, and estimating gross and net impacts using a variety of methods. We have addressed appliances, appliance recycling, electronics, and plug load. NMR is currently conducting a "What's Next for Products and Lighting Study" to aid in the development and design of future residential programs given market changes and increasing federal standards.
- **Residential New Construction:** NMR has been evaluating the Massachusetts Residential New Construction Program since 2002, always seeking to offer added value

by addressing multiple objectives. For example, NMR is currently conducting research that meets the needs of both the RNC program and the Code Compliance Support Initiative (CCSI): A single-family compliance/baseline study that will update the User-Defined Reference Home and also measure compliance for homes built at the end of the 2009 IECC cycle, the beginning of the 2012 IECC cycle, and under the stretch code.

Massachusetts Cross-Cutting Evaluation

NMR is the prime contractor working for the Massachusetts PAs under the direction of the Massachusetts Energy Efficiency Advisory Committee for special and cross-cutting studies in the areas listed below. NMR is the prime contractor for the 2017-2020 period, and was a key subcontractor for the 2010-2015 period.

- **Codes Compliance Support Initiative**: NMR has been leading the evaluation of the CCSI since its inception. This has involved code compliance assessment surveys and interviews of code training attendees, as well as code compliance documentation. NMR is currently conducting evaluations to assess the net savings attributable to CCSI on the commercial side, and to CCSI and the Residential New Construction Program on the residential side. A previous report using a similar methodology is here: 2014 Residential New Construction Net Impacts Report.
- **Market effects and net-to-gross**. NMR is the lead evaluation contractor in Massachusetts for market effects and net-to-gross evaluations, which have identified additional savings not tracked by the programs, thus making the programs more cost effective. We have conducted a review and provided recommendations of methods that can be used to estimate net-to-gross ratios for residential programs in Massachusetts. We also developed methodological guidelines for measuring the market effects of Massachusetts commercial and residential programs, and have developed detailed plans for measuring the market effects of several specific programs.
- **Non-energy impacts (NEIs):** NMR is the lead evaluation contractor for studies of non-energy impacts in Massachusetts, which in some cases have greatly increased the benefit side of the benefit/cost equation. NMR conducted an evaluation identifying and estimating values of the NEIs associated with all of Massachusetts PAs' residential and low-income energy-efficiency programs. As a follow-up to the NEI study, NMR developed adjusted NEI values for residential heating, cooling, and water heating equipment that is early replacement compared to equipment that is replaced on failure.

Small Business Direct Install Impact and Process Evaluation, National Grid New York

In our work for National Grid New York, NMR is combining traditional evaluation with M&V 2.0, and providing near-real-time results. We will present a paper on this project at the 2018 ACEEE Summer Study. The study is continuing in 2018, and we are integrating quarterly feedback surveys and additional real-time feedback through an online dashboard. We are also moving forward with integrating implementation more directly into the evaluation process.

"NMR provided excellent value for the money. There were a lot of actionable findings from just one study – very valuable." – Joe Dolengo, National Grid New York

National Grid New York contracted with NMR to conduct a process evaluation of the Small Business Direct Install program to assess the overall program, determine the relative effectiveness of two different delivery channels, and identify opportunities for ongoing improvement. Report: Process Evaluation of the Electric Small Business Services Program. IEPEC Paper: "A Tale of Two Channels: Assessing the Effectiveness of a Small Business Direct Install Program"

Evaluation of the Appliance Rebate Program, Retail Lighting Program, and Low-income Multifamily Program for Efficiency Maine.

NMR was the prime contractor on the following studies:

- For the Efficiency Maine Retail Lighting Program evaluation and the Appliance Rebate Program evaluation, NMR led a team to conduct both impact and process evaluations. The impact evaluations included on-site visits to inventory and meter usage of qualified light bulbs and appliances in order to estimate energy consumption, analysis of program data to calculate impact parameters such as efficiency levels and product lifetime, estimation of net-to-gross ratios via participant surveys and price elasticity modeling, and calculation of cost-effectiveness. The process evaluations included in-depth interviews with program staff, implementation contractors, and retailers, as well as customer surveys.
- NMR also led a team to conduct an evaluation of the Efficiency Maine Low-Income Multifamily Program. The central component of the impact evaluation was an analysis of electric and gas billing data to estimate energy savings at the measure level, preceded by the collection of billing data from participating properties. The impact evaluation also estimated program cost-effectiveness and compared results to other recent low-income multifamily evaluations. The process evaluation included in-depth telephone interviews with program staff, implementation contractors, and participating property managers, as well as surveys with tenants from participating properties and a best-practices review of other low-income multifamily programs.

Residential Baseline Studies for the Vermont Public Service Department

NMR led a team that conducted three separate assessment studies – starting in 2007 – of the existing home and newly constructed home markets in Vermont. These studies provided Vermont with detailed data on the single-family and multi-family housing stock and market conditions to

inform subsequent potential studies, baseline assumptions, and program plans. For each study, the team performed comprehensive on-site energy audits at several hundred homes, including data collection regarding the building shell, HVAC, water heating, appliances, and lighting, as well as the measurement of air infiltration and an analysis of code compliance. In addition, each study included hundreds of telephone surveys with homeowners and dozens of in-depth telephone interviews with a variety of market actors, including builders, distributors, contractors, and retailers.

Commercial & Industrial Evaluation, Massachusetts Program Administrators

NMR has been part of a team that has evaluated the Massachusetts commercial and industrial programs since 2010. NMR has led or contributed to numerous studies during that time, including the following: on-site data collection to support the impact evaluation of and net-to-gross measurement for the upstream lighting program, a study to identify the drivers of net-to-gross ratios, a market characterization study of the commercial gas boiler market, a general process evaluation of large C&I programs, a market assessment study of the chain and franchise market, and a study to estimate the market penetration of efficient HVAC technologies.

Process Evaluation and Net-to-Gross Analysis, Business Programs of the Independent Electric System Operator (Ontario)

For the 2016-2021 program years, as part of a team, NMR is leading the process and net-to-gross analysis of IESO's business programs. For all the programs, NMR conducted in-depth interviews with program staff and program partners/contractors, and surveys of participants and LDCs. We designed the survey instruments and net-to-gross algorithms, oversaw all process survey fielding and data collection activities, and led the analysis and reporting for the process and net-to-gross components of each program-specific evaluation.

Home Energy Services Air Sealing, Duct Sealing, and Insulation Practices Report, Connecticut Energy Efficiency Board

NMR conducted this process evaluation to identify additional savings opportunities for the Home Energy Services (HES) Program using a mixed-methods approach that included interviews with stakeholders, a review of program records, in-home interviews with homeowners, and post-weatherization inspections by HERS raters in the company of the HES contractors who actually performed the services. Report: Connecticut HES Air Sealing, Duct Sealing, and Insulation Practices Report. IEPEC Paper: "I'd Like to Fix Your Attic, But I'm Late for Another Appointment: Innovative Approaches to Uncovering the Real-World Practices of Weatherization Contractors"

Single-Family Homes Weatherization Study, Connecticut Energy Efficiency Board

NMR conducted a study to establish a baseline to help meet the legislated mandate that 80% of residences in Connecticut be weatherized by 2030. The study focused on single-family homes (both detached and attached) and included compliance assessments with the weatherization standard using both prescriptive and performance-based approaches. NMR used a disproportionately stratified sample design that achieved 10% sampling error or better at the 90% confidence level across the state of Connecticut and across various subgroups of interest (i.e., fuel type, home ownership status, and low-income/non-low-income status). NMR used certified

HERS raters to conduct 180 on-site inspections. Each site visit included comprehensive data collection that encompassed all the measures identified in the Connecticut weatherization standard, along with detailed information about mechanical equipment, lighting, and appliances. This information was used to develop energy models which were ultimately used for the performance-based weatherization assessment. The study provided information that was used to revise the weatherization definition for Connecticut's residential units. The study also provided valuable information for the HES/HES-IE programs about the baseline efficiencies existing in the marketplace and areas that could be targeted for program intervention.

KEY STAFF

Lynn Hoefgen, PhD
Founder and President

Lynn Hoefgen has over 30 years of experience in energy-related evaluation and market research. He has been the principal investigator for numerous impact, process, and market effects studies using multiple methods across the U.S. for various types of markets. Lynn holds a PhD in Anthropology from the University of Florida. lhoefgen@nmrgroupinc.com

Tom Mauldin
Executive Vice President

Tom Mauldin has 16 years of experience designing and managing process evaluations, impact evaluations, and market assessments across a wide variety of programs, including residential lighting, appliances, new construction, and energy audits, as well as commercial motors, HVAC, and new construction. He holds an MS in Ecology & Environmental Sciences from the University of Maine and a BS in Mechanical Engineering from Rutgers University. tmauldin@nmrgroupinc.com

Rohit Vaidya
Vice President

Rohit Vaidya has performed evaluation and market research for the energy industry for more than 20 years. He has overseen process evaluations of commercial/industrial, residential, low-income, and research and development programs. He has managed multi-year process and impact evaluations of energy-efficiency program portfolios. Rohit received his BS in Economics & Mathematics from the University of Delhi, India, and pursued graduate studies in Sociology at Columbia University in New York. rvaidya@nmrgroupinc.com

Lisa Wilson-Wright, PhD
Director

Lisa Wilson-Wright joined NMR in 2003 and brought with her extensive experience in the use of quantitative and qualitative research techniques to help inform energy efficiency, clean energy, and environmental policy. This includes conducting multivariate regression analysis, survival analysis, and billing analysis. She also has designed and administered surveys, conducted in-depth interviews, and analyzed qualitative data. Wilson-Wright holds a Ph.D. in Sociology from the University of Wisconsin. lwilson-wright@nmrgroupinc.com

Monica Nevius, PhD
Director

Monica Nevius has more than 15 years' experience in energy-efficiency program evaluation, including over ten years' experience leading the evaluation, research, and behavior work at the Consortium for Energy Efficiency (CEE). She is also a member of the Planning Committee for the International Energy Program Evaluation Conference. Monica holds a PhD in Sociology from the University of Wisconsin. mnevius@nmrgroupinc.com

Greg Clendenning, PhD
Director

Greg Clendenning's evaluation research experience includes net impacts and market effects of energy-efficiency programs, residential housing programs, non-energy benefits, clean and renewable energy, residential lighting and appliance programs, commercial lighting, and branding issues. He is currently serving as the director of the Statewide Evaluator contract for the Pennsylvania Public Utilities Commission. Greg holds a PhD in Forest Ecology and Management, with concentrations in Environmental Sociology and Urban and Regional Planning, from the University of Wisconsin-Madison. gclendenning@nmrgroupinc.com

David Barclay
Director

David Barclay has over a decade of experience designing, implementing, and evaluating energy-efficiency programs. David serves as the overall project manager for the Massachusetts Residential Lighting, Products, and New Construction research areas. Prior to joining NMR, David worked for Gainesville Regional Utilities, a multi-service municipal utility. David received his MS in Decision and Information Sciences from the University of Florida. dbarclay@nmrgroupinc.com

Zachary Tyler
Director

Zack Tyler is a certified HERS rater with extensive experience managing Residential New Construction and code compliance evaluations. He has managed baseline studies in Massachusetts, Rhode Island, Connecticut, and Vermont. In addition, he has led innovative studies to assess the potential savings associated with code compliance enhancement efforts. Mr. Tyler holds an M.A. in Energy & Environmental Analysis from Boston University and a B.A. in Environmental Studies from the University of Colorado at Boulder. ztyler@nmrgroupinc.com

A.2 Details of Technical Competence

A.2.1 Research Among Market Actors

NMR has conducted market research with a wide range of market actors. Table 4 shows the range of market actors that NMR studies have addressed.

Table 4: Research Methods by Target Audience

Methods	Market Actors							End Users		
	Building Code Officials	Building Industry Pros*	Manuf./ Manuf. Reps	Distributors	Retailers/ Retail Sales Managers	Trade Pros	Teachers/ Educators	Building Managers/ Owners	Consumer/ Residential Customers	Commercial Customers
Concept testing									●	
"Fast feedback" surveys									●	●
Delphi or expert panels	●	●	●							
Econometric analysis									●	●
Engineering analysis										●
Equipment metering									●	
Ethnography									●	
Focus groups – in person		●				●		●	●	●
Focus groups – on line			●							
In-depth interviews	●	●	●	●	●	●	●	●	●	●
Intercepts									●	
Journey mapping						●				●
Market segmentation									●	
Market share and sales data collection		●	●	●	●	●			●	●
Participant observation									●	
Residential panels									●	
Survey research	●	●		●	●	●	●	●	●	●

*Includes Engineers & Architects

A.2.2 Quality Management

NMR has consistently demonstrated its unrivaled commitment to providing high-quality research products with actionable conclusions and recommendations. Producing the highest quality work possible is one of NMR's core values. Our drive for quality has been advanced through a focus on recruiting and hiring staff who take pride in delivering quality.

To ensure that we continue to produce the highest quality work products on time and on budget, NMR has established a multi-phase quality control process that starts well before a client hires us to plan a project and carries through to delivery of the final report.

NMR Core Practices

- Establish quality as a core value for all projects
- Provide staff with examples of quality work products
- Recruit and hire staff who take pride in delivering quality
- Provide staff with rigorous training
- Reward staff for emulating NMR's core values – especially quality
- Assign experienced, senior-level staff members to manage all aspects of projects

Project Planning and Design

- Catalog and identify potential pitfalls and roadblocks
- Have a second senior-level staff member review budgets and plans
- Review previous project plans, budgets, and final reports when drafting plans
- Pursue teaming arrangements with firms that honor a commitment to quality
- Work with clients to understand their needs and expectations
- Establish clear protocols and procedures for tasks

Project Management

- Monitor for potential pitfalls and roadblocks
- Carefully review all work products prior to delivery
- Monitor project activities and check in with team members regularly
- Provide clients with status updates and solicit client engagement on decisions
- If a problem is identified, alert clients quickly and work to find a solution
- Monitor budget and expenditures regularly, and respond as necessary
- Monitor progress versus schedule, and respond as necessary

Quantitative Data Collection Review

- Double-check survey questionnaires for wording, logic, and skip patterns
- Assist with interviewer training to provide project background and assure excellence in data collection procedures
- Test programming of surveys before pretesting begins
- Conduct survey pretests to identify and correct unclear questions, problems with skip patterns, and issues with instrument length
- Monitor surveys during the pretest and during the first day of interviewing
- Review preliminary data early in the data collection process to identify and correct any issues

Quantitative Data Set Review

- Review data sets by employing completeness, range, and consistency checks.

- Review and clean data carefully – establish limits and check for outliers
- Resolve questionable values through discussions with the data collection firm
- Review all codes and coding schemes

Quantitative Data Analysis Review

- Review and check all statistical programming instructions and procedures
- Perform cross-verification calculations of all spreadsheet-based analyses

Qualitative Data Collection Review

- Ensure analysts responsible for in-depth interviews have a clear understanding of project objectives and the nature of the program being evaluate
- Train the analysts on the specific research instrument/discussion guide
- Monitor first interview or review a recording of it to provide feedback

Qualitative Data Analysis Review

- NMR project manager will supervise analysts who are synthesizing results, reviewing results and conclusions as they are developed
- For projects with large numbers of in-depth interviews, NMR may employee qualitative data analysis software such as Dedoose, which facilitates coding, consistent treatment of data, and analysis at many levels

Analysis and Reporting

- Step back and try to see the big picture – identify the narrative in the data
- Identify what we know and what we do not know—and make sure to communicate it
- Identify threats to validity and acknowledge and address them
- When possible, attempt to triangulate results or replicate them using various methods

Deliverables Review

- NMR senior staff will review draft and final plans, reports, and memos at least once for content, accuracy, and grammar by a senior NMR staff member
- NMR professional editors will review draft and final plans, reports, and memos for grammar and formatting

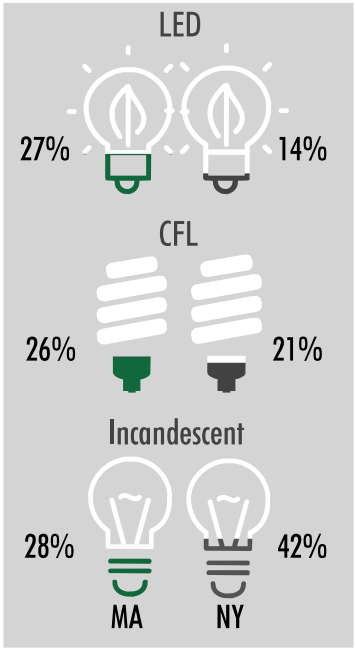
A.2.3 Examples of Report Infographics

Below, we have included examples of report infographics that we have developed for our clients.

Massachusetts Residential Lighting Market Assessment

As the results of this study show, the Massachusetts programs have had a strong impact on the saturation and penetration of LED bulbs. LED saturation and penetration rates in the comparison area (New York) continue to lag behind the rates measured in Massachusetts. In addition, ENERGY STAR LEDs (the only LEDs supported by the programs) account for the majority of the difference in LED saturation between the two states - with more than three times as many ENERGY STAR LEDs found in use in Massachusetts compared to New York.

2018 Saturation Rates



In 2018, LED saturation (the percentage of sockets filled with these bulbs) was significantly higher in Massachusetts than in New York.

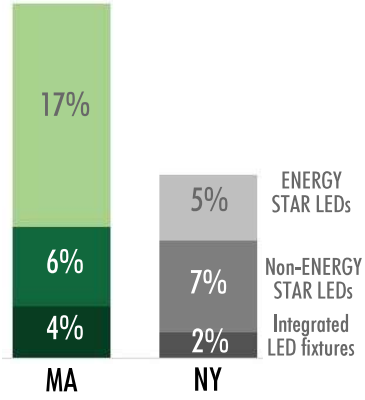
Incandescent saturation was significantly lower in Massachusetts.

In Massachusetts, 74% of LEDs obtained in the previous year were ENERGY STAR, compared to 37% in New York.

Saturation of ENERGY STAR LEDs in Massachusetts (17%) was more than three times the rate observed in New York (5%).

This is strong evidence that the Massachusetts programs (which exclusively support ENERGY STAR products - including LEDs) are driving increased adoption of LEDs.

ENERGY STAR LED Saturation

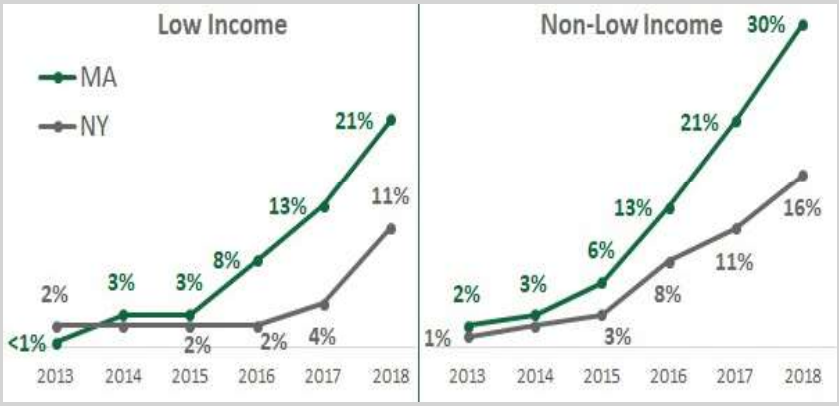


LED Saturation by Demographics

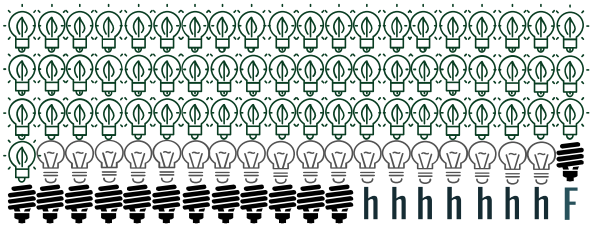
In 2018, LED saturation among both non-low-income and low-income households in Massachusetts was significantly higher compared to counterpart households in New York.

LED saturation was also significantly higher in Massachusetts in multifamily households, single-family households, owned homes, and homes where the highest level of education was "some college, Associate's degree" or "Bachelor's degree or higher."

LED Saturation by Income 2012-2018

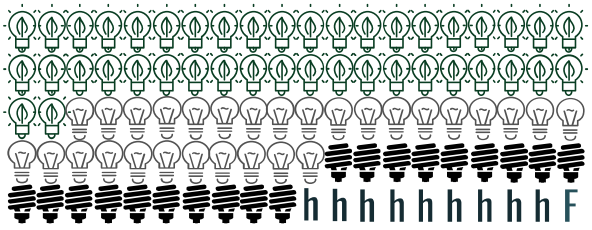


Newly Installed Replacement Bulbs (%) 2017-2018



LED bulbs (61%) were the most common replacement bulb installed in Massachusetts households, followed by incandescent bulbs (28%), CFLs (13%), halogen bulbs (7%), and linear fluorescents (1%); empty sockets exluded.

LED
CFL
Incandescent
h Halogen
F Fluorescent



LED bulbs (42%) were also the most common replacement bulb installed in New York households, followed by incandescents (29%), CFLs (19%), halogen bulbs (9%), and linear fluorescents (1%); empty sockets excluded.

MA Appliance Recycling

Evaluating the Energy Savings and Participant Experience from an Appliance Recycling Program

NMR conducted a study to update gross, adjusted gross, and net energy savings for the MassSAVE Refrigerator and Freezer Recycling Initiative. The study also examined participant satisfaction and overall experiences with the program. Participant satisfaction with the program is high, driven by both personal and environmental benefits.

	Net-to-gross Ratio	Gross Energy Savings	Adjusted Gross Savings	Net Energy Savings
Refrigerators	44%	1,019 kWh	897 kWh	398 kWh
Freezers	56%	718 kWh	488 kWh	275 kWh

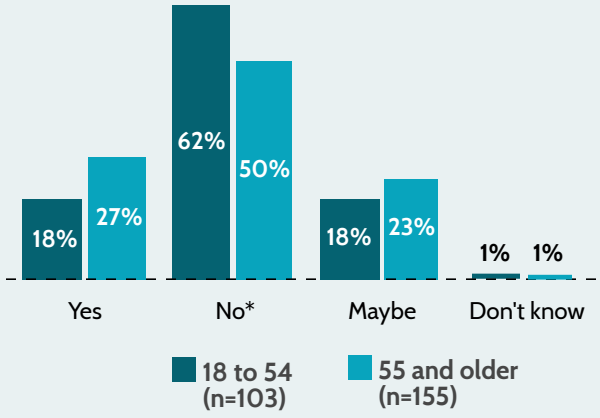
Who is willing to pay for appliance removal?

The program provides a valuable service to those who otherwise might have been unable to physically move or have access to transportation to dispose of old and unwanted units. As shown in the figure to the right, the survey found that the bulk size of the old refrigerators or freezers presented a greater disposal obstacle for older respondents than younger respondents.

About one-half of participants said they would have been willing to pay $25 for the removal service. However, younger respondents were more likely to say they were unwilling to pay any amount for removal services.

* Respondents aged 18 to 54 are significantly different than respondents aged 55 or above at the 90% confidence level

Appliance Removal Hindered by Physical Removal and Transportation



Participant Experience

97% program satisfaction

98% easy application process

93% easy pick-up scheduling

Drivers of Satisfaction

86%
Smooth process

80%
Positive environmental impact

74%
Convenient pick-up

A.2.4 Examples of Instruments and Data Collection Tools

This section includes instruments and data collection tools referenced in project examples cited under Section 1. The table below lists the projects and instruments based on the order in which they are discussed above.

Project	Instrument(s)
Massachusetts Lighting Market Assessment	Massachusetts Lighting Consumer Survey
What's Next for Products	Market Scan Interview Guide
Massachusetts C&I Massachusetts Boiler Market Characterization Study Phase II	Manufacturer Feedback Form Template

Massachusetts Lighting Consumer Survey 2016

[FOR WEB SURVEY ONLY] National Grid, Eversource, Cape Light Compact, and Unitil are interested in your knowledge and experience with various lighting products. This survey asks a number of questions about lighting your home. Please answer the questions to the best of your ability. All of your responses will remain confidential. The survey will take approximately 15 minutes to complete.

[FOR PHONE SURVEY] Hello, my name is _____ and I am calling from [SURVEY FIRM] on behalf of (PA). You should have received a letter from (PA) explaining a study that they are doing about household lighting. I'm not selling anything. I just want to ask you some questions about lighting in your home. The survey will take about 15 to 20 minutes to complete.

May I please speak with [INSERT NAME ON THE ACCOUNT]?

[IF ACCOUNT HOLDER ISN'T AVAILABLE, READ] Is there an adult over the age of 18 available who is responsible for purchasing the light bulbs for your household? [IF NOT AVAILABLE, TRY TO RESCHEDULE AND THEN TERMINATE]

[If necessary, offer the contact name from below as the person to contact with any questions about the validity of the research.]

[INSERT CONTACTS]

Screeners:

R1 Are you 18 years of age or older?
- 1 Yes [CONTINUE]
- 2 No [THANK AND TERMINATE] [SKIP TO TERM]

R2 Is [ADDRESS] in Massachusetts your primary address, meaning that you live in Massachusetts most of the year?
- 1 Yes [DEM1]
- 2 No [SKIP TO R2A]
- 3 (Don't know) [SKIP TO R2A]

R2A Is your primary address in Massachusetts?
[INTERVIEWER NOTE: IF R DOES NOT HAVE A PRIMARY ADDRESS IN MASSACHUSETTS, THANK AND TERMINATE]
- 1 Yes
- 2 No, I do not have a primary address in Massachusetts [THANK AND TERMINATE] [SKIP TO COM]
- 3 DON'T KNOW [THANK AND TERMINATE] [SKIP TO COM]

R2B Could you please confirm the zip code in which you live in Massachusetts?
[INSERT ZIP CODE]
- 1 Confirmed Zip Code
- 2 Other zip (SPECIFY)

8 Don't know/refused [SKIP TO END]

DEM1 Please keep your primary address in mind while answering the remaining survey questions. What type of home do you live in? [PHONE: WOULD YOU SAY THAT IT IS…?]

1 A one-family house detached from any other house
2 A one-family house attached to one or more houses
3 In a building with 2, 3, or 4 apartments
4 In a building with 5 or more apartments
5 A mobile home?
6 Or something else? [SPECIFY]
7 (Don't know/refused)

DEM1A (IF DEM1=6) Is your home considered a condominium?

1 Yes
2 Something else (SPECIFY)
3 (Don't know/refused)

DEM1B (IF DEM1A= 1) What type of condominium is it? [PHONE: WOULD YOU SAY THAT IT IS…?]

1 A townhouse condominium that has one or more units, with a wall separating the units from basement to roof
2 A condominium in a building with 2, 3, or 4 units attached to each other but without a wall separating the units from basement to roof; triple-deckers are an example of this type.
3 A condominium in a building with 5 or more units attached to each other but without a wall separating the units from basement to roof, for example an apartment style condo.
4 Another type of condominium. (Specify)
5 (Don't know)

DEM2 Do you or members of your household own this home or do you rent?

1 Own/Buying
2 Rent/Lease
3 Occupied without Payment or Rent
4 OTHER (SPECIFY)
5 DON'T KNOW

Awareness of energy-saving light bulbs

S1 Compact fluorescent light bulbs – also known as CFLs – usually do not look like regular incandescent bulbs. The most common type of CFL bulb is made with a glass tube bent into a spiral, resembling soft-serve ice cream, and it fits in a regular light bulb socket. How familiar are you with CFLs? [PHONE: WOULD YOU SAY THAT YOU ARE…?]

1 Very familiar
2 Somewhat familiar
3 Not too familiar
4 Not at all familiar
5 DON'T KNOW

S2 Another type of light bulb that is used in homes is called an LED [PHONE: SAY THE LETTERS L-E-D], also known as a light emitting diode bulb. These bulbs have regular screw bases that fit into most sockets. We are not referring to battery-operated LEDs, holiday lights, or decorative strands. How familiar are you with LED light bulbs that screw into regular light sockets? [PHONE WOULD YOU SAY THAT YOU ARE…?]

1 Very familiar
2 Somewhat familiar
3 Not too familiar
4 Not at all familiar
5 DON'T KNOW

S3 Another type of light bulb is a halogen bulb. These bulbs have regular screw bases that fit into most sockets; they do not need special attachments to work in regular sockets. How familiar are you with halogen bulbs that screw into regular light sockets? [PHONE WOULD YOU SAY THAT YOU ARE…?]

1 Very familiar
2 Somewhat familiar
3 Not too familiar

4 Not at all familiar
5 DON'T KNOW

S4 A recent federal law, the Energy Independence and Security Act of 2007, restricted the sale of standard 100 Watt, 75 Watt, and 40 and 60 Watt incandescent bulbs. Had you heard about this law before today?
1 Yes
2 No
3 DON'T KNOW

CFL and LED use

USE1 [ASK IF S1= 1, 2, or 3] Have you EVER used a CFL bulb on the interior or exterior of your home?
1 Yes
2 No
3 DON'T KNOW

[ASK USE2 IF S2= 1, 2, OR 3]

USE2 Have you EVER used an LED screw in bulb in your home—the kind that screw into regular light fixtures?
1 Yes
2 No
3 DON'T KNOW

USE3 [IF USE1 = 1 AND USE2=1, ELSE SKIP TO BUY0] Based on what you have told me, you have used both CFLs and LEDs. Thinking about each of these bulbs, would you say that you… [RANDOMIZE 1 AND 2 THEN ASK 3]
1 Prefer CFLs over LEDs
2 Prefer LEDs over CFLs
3 Depends on the situation
4 Not yet sure which you prefer
5 Refused (use for phone survey only)

USE4 [PHONE ONLY - IF USE3 <> 5] Why do you say this? [RECORD VERBATIM]
1 (CFLs are less expensive than LEDs/LEDs more expensive than CFLs)
2 (CFLs are more energy efficient compared to LEDs)
3 (LEDs turn on instantly)
4 (LEDs produce better light than CFLs)
5 (LEDs have a longer bulb life/CFLs have a shorter bulb life)
6 (LEDs are more energy efficient compared to CFLs)
7 (Depends on lighting needs or settings)
8 (DON'T KNOW) (use for phone survey only)
9 (REFUSED) (use for phone survey only)

USE5 *This will be a question about specialty bulbs but still working on language.*

Recent lighting purchases

BUY0 [IF DEM2 = 2] Who is responsible for purchasing bulbs in your home?

1 I or someone else who lives here is responsible for purchasing bulbs for my home
2 The landlord/building management is responsible for purchasing bulbs for my home [SKIP TO R3]
3 (Don't know) [SKIP TO R3]

BUY1 Which of the following have you purchased in the past six months??

1 CFLs
2 LEDs
3 Other types of bulbs (Please specify)
4 I have not purchased any light bulbs in the past six months
5 (Don't know)

BUY2 [PHONE: I'm going to read a list of…] [WEB: Below is a list of…] information you might look for when shopping for light bulbs. Which of the following have you looked for when shopping for light bulbs? [Select all that apply] [PHONE: RANDOMIZE 1-14, THEN READ. RECORD AS YES/NO FOR EACH.]

1 Price
2 Lighting Facts/Energy Facts Label
3 Wattage
4 Watt Equivalency
5 ENERGY STAR Label
6 Lumens
7 CRI, or Color Rendition Index
8 Bulb Life
9 Dimming
10 Shape
11 Mercury Content
12 Color Appearance
13 Other [SPECIFY]
14 (I have never shopped for light bulbs)
15 (Don't know)
16 (Refused)

BUY2a [SKIP IF BUY2.14=1][IF BUY2.1 = 1 READ, "OTHER THAN PRICE] WHICH OF THESE IS MOST IMPORTANT IN YOUR SELECTION OF A LIGHT BULB? [IF NEEDED, FOR PHONE RESPONDENTS REMIND INTERVIEWEE OF WHAT THEY JUST SELECTED (PERHAPS HAVE IT ON THE SCREEN FOR INTERVIEWER TO SEE IF NEEDED). FOR WEB, ALLOW THEM TO SELECT ONE ITEM FROM AMONG ALL BUY2 = 1, EXCLUDING PRICE.] RECORD RESPONSE _____

BUY3 [IF BUY1 = 1 or 2] When you bought light bulbs in the past six months, did you see any lighting signs, displays, or other materials near the light bulbs? These would be signs other than the price of the bulb.

1 Yes
2 No
3 DON'T KNOW

BUY4 [IF BUY3 = 1] What sign, displays, or other materials did you see?
[WEB: (Please type answer below)]
[PHONE: DO NOT READ. RECORD VERBATIM ANY RESPONSES THAT DO NOT FIT PRECODES. SELECT ALL THAT APPLY]

1 (Told me the bulb was part of a MassSAVE program)
2 (Told me that the bulb was part of a utility or energy-efficiency program)
3 (Displayed different types of light bulbs)
4 (Tried to help me choose the best bulb for my needs)
5 (Explained what bulbs I should use to replace an incandescent)
6 (Compared energy use or savings of different light bulbs)
7 (Explained that some bulb types would not be sold anymore)
8 (Explained lighting terms like lumens, wattage, bulb color, Kelvin, color rendition)
9 (Other, specify)
10 DON'T KNOW
11 REFUSED

Bulb Replacement Behavior

BRB1 We are interested to know the type of bulb you would be likely to use when replacing a standard or twist bulb in your home. Which of the following bulb types would you be most likely to use when replacing a standard or twist bulb in your home: [RANDOMIZE 1-4, THEN READ 5]

1 LED
2 CFL
3 Incandescent
4 Halogen
5 Whatever bulb type I have in storage
6 Other [SPECIFY]
7 [Don't know]

BRB2A Would your response change if price were not a factor?

1 Yes
2 No
3 Don't know
4 Refused

BRB2B [IF BRB2A=1] Ignoring price, which of the following bulb types would you be most likely to use when replacing a standard or twist bulb in your home: [RANDOMIZE 1-4, THEN READ 5]

1 LED
2 CFL
3 Incandescent
4 Halogen
5 Whatever bulb type I have in storage
6 Other [SPECIFY]
7 [Don't know]

BRB2 You said you would most likely use a [IF BRB2A=2, 3 or 4 INSERTE BRB1 RESPONSE HERE; IF (BRB2A2=1) AND (BR2B=2, 3, OR 4), INSERT BRB2B RESPONSE HERE] to replace a standard or twist bulb in your home. Why that bulb?

1 [RECORD VERBATIM]
2 Don't know
3 Refused

Customer demographics

[CHECK QUOTA COUNTS (TO BE PROVIDED): IF DEM1= 1, 2, OR 5 (SINGLE FAMILY); IF DEM1= 3 (SMALL MULTIFAMILY); IF DEM1=4 (LARGE MULTIFAMILY); IF DEM1= 6 OR 7 GO TO DEM3]

[IF DEM1=7 OR DEM1A=2 OR DEM1B=4 GO TO DEM3]

R3 [INSERT PA] is offering you the opportunity to take part in an important study. We are offering eligible households $150 to allow a trained technician to visit their homes to gather more information about the lighting products they use. The visit should take about an hour and a half. If your home is found to be eligible, the visit may also involve a trained technician walking through your home and recording the types of lighting products that you are using. During this visit, there will be no attempt to sell you anything. The information gathered will be used to evaluate and improve the energy efficiency programs offered by your electric utility.

Would you be interested in being a part of this type of visit?
1 Yes [GO TO R5 BELOW FAQ]
2 No [GO TO DEM3]
3 (Don't know [GO TO R4]

R4 We understand you are unsure about the home visit, here is some additional information to help make your decision -

What's in it for me and how long will this take?
We are offering $200 for your time. The visit should take around one hour and a half, depending on the size of your house.

What does the visit involve?
Technicians will walk around your home and count the various types of lighting products you have installed.

When will the visits take place?/Can I schedule a visit now?
We will be calling in in the next two to three weeks to schedule the visits. The visits will happen in November, December, January and February.

Who are you?
NMR Group, Inc. and Tetra Tech are consulting firms. We have been hired by <PA> to perform this study.

What is the purpose of this study?
The purpose is to establish customer awareness of lighting options and changes in the lighting market. The results of the study will be used in planning for future energy needs in Massachusetts.

How do I know you are legitimate?
<PA> is sponsoring this program and study. If you would like to contact <PA> to confirm, the contact person is <UTCT2>.

R4a [IF R3=3] You do not have to decide now. Would it be okay if someone calls you when visits are being scheduled to talk more about what would be involved?
1 Yes [CONTINUE TO R5]
2 No [GO TO DEM3]

R5 [IF R3=1 or R4=1, READ. "[PHONE: I just need to get some] [WEB: Please provide your] contact information so we can call and [schedule the visit./talk about the visit]"]
First and Last Name: [RECORD]_____

R6 [IF R3=1 or R4=1] Primary Number (###-###-####):
[RECORD NUMBER; IF SAME NUMBER CALLED FOR SURVEY INDICATE HERE]_

R7 Secondary Number (###-###-####): _____

R8 [PHONE: IF RESPONDENT VOLUNTEERS THAT THEY PREFER TO BE CONTACTED BY EMAIL COLLECT EMAIL ADDRESS. OTHERWISE, DO NOT COLLECT EMAIL ADDRESS.
EMAIL: _____]

R9 [IF YES] What is the best time of day to reach you? Morning, afternoon, or evening?
1 Morning
2 Afternoon
3 Evening
4 (Anytime/[PHONE: Don't know/refused)]

R10 [IF YES & New Address R2=2] In what city do you live, and what is your zip code?
CITY: _____

R11 [IF R3=1] If your household is eligible for this study, when we call to schedule, your caller ID will most likely say "NMR or NMR Group" and will have a 617 area code.]

Now, there are just have a few more questions about some characteristics of your households. [IF R3=1 These questions will help us make sure we visit a wide variety of homes in the state.]

DEM3 [ASK DEM3 IF DEM1= 1, 2 OR DEM1B= 1. OTHERWISE, SKIP TO DEM4.] When was your home built? [PHONE: PLEASE STOP ME WHEN I GET TO THE APPROPRIATE CATEGORY.]

1 1930s or earlier
2 1940s
3 1950s
4 1960s
5 1970s
6 1980s
7 1990s
8 2000
9 2010 or later
10 DON'T KNOW

DEM4 Approximately how large is your home? [PHONE: READ LIST]

1 Less than 1,400 square feet
2 1,400 to less than 2,000 square feet
3 2,000 to less than 2,500 square feet
4 2,500 to less than 3,500 square feet
5 3,500 to less than 4,000 square feet
6 4,000 to less than 5,000 square feet
7 5,000 square feet or more
8 DON'T KNOW

DEM5 How many rooms are in your home, not counting bathrooms?
[PHONE: HELP RESPONDENTS COUNT ROOMS IF NEEDED, KEEPING TRACK ON A PIECE
OF PAPER OF THE # OF ROOMS AS THEY NAME THEM]
__ RECORD RESPONSE
99 DON'T KNOW

DEM6 Which of the following best describes your age? [READ LIST]

1 18-24 years old
2 25-34 years old
3 35-44 years old
4 45-54 years old
5 55-64 years old
6 65-74 years old
7 75 or older
8 DON'T KNOW

9 Prefer not to answer

DEM7 What is the highest level of education achieved by anyone in your household so far? [PHONE: READ CATEGORIES]

1 Less than Ninth Grade
2 Ninth to Twelfth Grade, No Diploma
3 High School Graduate (includes GED)
4 Some College, No Degree
5 Associates Degree
6 Bachelor's Degree
7 Graduate or Professional Degree
8 Prefer not to answer

DEM8. Please tell me the primary language spoken in your home.

1 English
2 Spanish
3 Mandarin
4 Cantonese
5 Tagalog
6 Korean
7 Vietnamese
8 Russian
9 Japanese
10 OTHER (SPECIFY): _____
11 Prefer not to answer

DEM9 Counting yourself, how many people live in your home for most of the year?

1 (1) Person [GO TO DEM10_1]
2 (2) People [GO TO DEM10_2]
3 (3) People [GO TO DEM10_3]
4 (4) People [GO TO DEM10_4]
5 (5) People [GO TO DEM10_5]
6 (6) People [GO TO DEM10_6]
7 (7) People [GO TO DEM10_7]
8 (8) or more people [GO TO DEM10_8]
9 Prefer not to answer [GO TO DEM11]

D10_1 [IF DEM9=1] Which of these categories best describes your total household income in 2016 before taxes—counting everyone living in your house?

1 Less than $34,001, OR [GO TO DEM11]
2 $34,001 or more [GO TO DEM11]
3 Prefer not to answer [GO TO DEM11]

D10_2 [IF DEM9=2] Which of these categories best describes your total household income in 2016 before taxes—counting everyone living in your house?

1 Less than $44,463, OR [GO TO DEM11]
2 $44,463 or more [GO TO DEM11]

3 Prefer not to answer [GO TO DEM11]

D10_3 [IF DEM9=3] Which of these categories best describes your total household income in 2016 before taxes—counting everyone living in your house?

1 Less than $54,925, OR [GO TO DEM11]
2 $54,925 or more [GO TO DEM11]
3 Prefer not to answer [GO TO DEM11]

D10_4 [IF DEM9=4] Which of these categories best describes your total household income in 2016 before taxes—counting everyone living in your house?

1 Less than $65,387 OR [GO TO DEM11]
2 $65,387 or more [GO TO DEM11]
3 Prefer not to answer [GO TO DEM11]

D10_5 [IF DEM9=5] Which of these categories best describes your total household income in 2016 before taxes—counting everyone living in your house?

1 Less than $75,849, OR [GO TO DEM11]
2 $75,849 or more [GO TO DEM11]
3 Prefer not to answer [GO TO DEM11]

D10_6 [IF DEM9=6] Which of these categories best describes your total household income in 2016 before taxes— counting everyone living in your house?

1. Less than $86,311 OR [GO TO DEM11]
2 $86,311 or more [GO TO DEM11]
3 Prefer not to answer [GO TO DEM11]

D10_7 [IF DEM9=7] Which of these categories best describes your total household income in 2016 before taxes— counting everyone living in your house?

1 Less than $88,272, OR [GO TO DEM11]
2 $88,272 or more [GO TO DEM11]
3 Prefer not to answer [GO TO DEM11]

D10_8 [IF DEM9=8] Which of these categories best describes your total household income in 2016 before taxes— counting everyone living in your house?

1 Less than $90,234, OR [GO TO DEM11]
2 $90,234 or more [GO TO DEM11]
3 Prefer not to answer [GO TO DEM11]

DEM11 [EVERYONE] Which category best describes your total household income in 2016 before taxes? [PHONE: Please stop me when I get to the appropriate category.]

1 Less than $15,000
2 $15,000 to less than $20,000
3 $20,000 to less than $30,000
4 $30,000 to less than $40,000
5 $40,000 to less than $50,000
6 $50,000 to less than $75,000

7 $75,000 to less than $100,000
8 $100,000 to less than $150,000
9 $150,000 or more
10 Prefer not to answer

DEM12 Which of the following best describes how your electric bill is paid:
1 I pay my electric bill
2 Someone else pays my electric bill
3 [IF DEM2 = 2] My bill is included in my rent
4 Other [SPECIFY]
5 Don’t know
6 Prefer not to answer

FIN Thank you very much for taking the time to complete this important survey. (IF R3=1 or R4a = 1: The NMR Group will be scheduling these visits in the next few weeks and will call you then.) (FOR WEB SURVEY ONLY: Please press 'Next' to submit your survey) Do you have any comments you would like to share with the research team?
1 Yes
2 No

TERM [IF R1=2] Thank you for your interest in this study. You must be 18 years or older to complete the survey. Please proceed to the next page to find out more about ways to save energy.

COM [IF R2A=2 OR 3] Thank you for your interest in this study. We are currently only surveying people who live in Massachusetts permanently. (FOR WEB SUREY ONLY: Please proceed to the next page to find out more about ways to save energy.)

Massachusetts What's Next for Products Market Scan Interview Guide

Hello, my name is _____ and I am calling from the NMR Group on behalf of the Massachusetts Residential Lighting, Products and New Construction Program Administrators. We're conducting a study geared at aiding in the development and design of a products program given significant market changes and increasing federal standards, particularly around lighting (and significantly decreasing savings from traditional upstream lighting programs). Note that we are not looking for information on lighting except for connected lighting products. This includes identifying products for possible inclusion in the residential program portfolio that will achieve cost-effective savings. We appreciate your insights on these topic areas. The survey will take about XX minutes to complete.

Groups

Traditional Products: TP
Midstream Products: MP
Upstream Products: UP
Demand Response: DR
Connected Home/Lighting: CH
Energy Storage: EST
Industry Experts: IE

Roles and Responsibilities (All Groups)

1. What is your current title?

2. What are your main job responsibilities?

Achieving Savings Given Strict Standards (All Groups)

3. In your experience, what is best way for products programs to operate effectively given the relatively small savings between efficiency standards (regulation) and ENERGY STAR or CEE standards?

4. How can program administrators also offer successful products programs in the face of ever-increasing *federal* standards?

5. How [IF IE READ: "should PAs" ALL OTHER GROUPS READ: "do you"] handle providing incentives for CEE tiers since there is no marking/label to designate them, as with the ENERGY STAR label? Is this best accomplished through midstream or upstream efforts?

6. How can program administrators address free ridership among product categories largely dominated by ENERGY STAR products (refrigerators for example)?

7. In the current market, what role do you think downstream, midstream, and upstream markets play? Is this changing? If so, how will programs need to adapt? [IF NECESSARY: DOWNSTREAM refers to programs in which incentives go directly to the consumer.

MIDSTREAM refers to programs in which incentives go to the retailer or distributor. UPSTREAM refers to programs in which the incentives go to the manufacturer.]

8. Do you monitor and plan for changes in standards? Do you actively participate in any groups that advocate for standard changes? If so, how do the total savings from the standards changes compare to any savings you claim for incenting efficient products? (i.e., do the savings claims from the standard changes you promote exceed that from your products programs themselves?). Which group(s)? Do you claim savings for your efforts to inform standard changes?

Products that Have Shown Savings/Potential Future Product Emphasis (All Groups)

9. [ALL GROUPS EXCEPT IE] We understand that you are currently offering [READ PRODUCTS FROM PROGRAM RECORDS] through your products program. Is that correct? Why those products? Could you tell us more about your experience sponsoring [READ PRODUCTS FROM PROGRAM RECORDS] and the savings you have achieved?

10. Of the products [IF IE READ: “currently on the market” ALL OTHER GROUPS READ: “you are currently supporting”], which offer the greatest savings opportunities right now? Which have the greatest savings opportunities moving forward?

11. [ALL GROUPS EXCEPT IE] Are there any products that you support that you think other PAs likely do not but should consider? Have you found these products to be cost effective based on a TRC perspective?

12. What products [ALL GROUPS EXCEPT IE READ: “if any, are you not currently supporting, but” IF IE READ: “do you”] think have the greatest potential in the future?

13. [IE ONLY] Are there any products on the market that are being supported by a small number of PAs that you think more PAs should consider?

14. [IE ONLY] Are there any products that utilities are currently promoting or considering promoting that still have "bugs" or issues that should be worked on so the consumer is not turned off from the product? For example, some poor quality Compact Fluorescent Light bulbs (CFLs) were introduced to the market early and turned consumers off from that technology for years. Are there any products you worry about this happening with?

15. Which products are being targeted for your future program activity – do you have any new concepts or ideas on the horizon? How will those products be administered in your program?
    a. Do you have anyany products or designs without programs yet, but hope to have them in the future? Any products you are keeping your eye on and the reason(s) you aren’t ready to include them just yet?
    b. Any programs or designs that have potential but are not yet ready for full-scale implementation? [IF ANY MENTIONED] What needs to happen to the market first in order for them to be viable?

16. What level of savings do you expect from new products or strategies?

17. [IF IE READ: “Are you aware of,” ALL OTHER GROUPS READ: “Are you currently running or aware of”] any pilot studies or projects with new product offerings in the areas of:
    a. Connected Lighting / Smart Lighting
    b. Connected Homes / Smart Homes
    c. Emerging technologies
    d. Electric vehicles / Battery Storage Systems
    e. Anything else?

Downstream Program Design (TP)

18. We understand that you currently run [IF MULTIPLE PROGRAMS READ “a” OTHERWISE READ “your”] products program as a downstream design. Is that correct?

19. What do you see as the greatest advantage of this design? Why? [PROBE: Greater claimed savings? Increased uptake? Increased program awareness?]

20. Any disadvantages?

21. Have you considered moving to, or have you moved from, a midstream or upstream approach, working with retailers or manufacturers as opposed to customers? Why or why not?

Midstream Program Design (MP)

22. We understand that you currently run [IF MULTIPLE PROGRAMS READ “a” OTHERWISE READ “your”] products program as a midstream design. Is that correct?

23. What do you see as the greatest advantage of this design? Why? [PROBE: Greater claimed savings? Increased uptake? Increased program awareness?]

24. Any disadvantages?

25. [READ IF PA SPONSORS AN RPP PROGRAM] What caused you to sponsor an RPP program and how has this differed from sponsoring a traditional downstream products program? How do you measure these savings, and do you think they are sustainable over a long period?

26. [READ IF PA SPONSORS AN RPP PROGRAM] What has been your experience working with retailers to run an RPP program?

27. [READ IF PA SPONSORS AN RPP PROGRAM] What marketing and educational techniques have you used to enhance the RPP program? Have these efforts been successful?

28. Have you considered moving to, or have you moved from, a downstream or upstream approach, working with retailers or manufacturers as opposed to customers? Why or why not?

Upstream Program Design (UP)

29. We understand that your current products program is run as a upstream design. Is that correct?

30. What do you see as the greatest advantage of this design? Why? [PROBE: Greater claimed savings? Increased uptake? Increased program awareness?]

31. Any disadvantages?

32. Have you considered moving to, or have you moved from, a downstream or midstream approach, working with retailers or manufacturers as opposed to customers? Why or why not?

Demand Response (DR and IE)

In your experience, which products have the potential to deliver successful reductions through a demand response program? Why?

33. Which products show promise in the future in demand response solutions? Why? Have you seen these products (e.g. smart thermostats) create energy savings outside of demand reduction?

Energy Storage (EST)

34. How have you used energy storage in your residential efficiency efforts?

35. Do you feel that they are an option best suited for customers with solar panels, or do you believe that they are an effective demand-response measure for any interested customer? Why?

36. Does energy storage only benefit the household in which batteries are installed, or [ALL GROUPS EXCEPT IE READ: “do you” IF IE READ: “would you”] utilize all connected batteries to reduce peak demand across the entire system?

37. How do you measure/claim savings from your residential battery program?

38. Do you view battery storage systems as a viable addition to most products programs moving forward?

Plug Load (All Groups)

39. What trends do you anticipate for plug loads in the near future? [Probes: decentralized entertainment, increase, decrease, battery operated devices, etc.]

40. How do you think plug load trends will help shape products programs moving forward?

41. What should Program Administrators do to better understand plug load trends and trajectories, and what do you think is the most effective way to manage projected increases in plug load consumption?

Consumer Choice (All Groups)

42. Many consumers go into a store looking for a very specific product—a French door fridge with in-door water and no-fingerprint finish, for example. It's unlikely a $35 rebate will change their preference. How do you think programs can best influence consumer choice and purchasing behavior? [Probe: midstream vs. upstream, code advocacy, etc.]

43. Should PAs insert themselves into the process earlier (e.g. work directly with manufacturers?)

Additional Questions (All Groups)

44. How can products programs most successfully achieve cost effectiveness? What are the most challenging aspects in reaching cost effective levels? [Probe: midstream, upstream, downstream, specific partners, breadth of products, costs, free-ridership, etc.]

45. In a recent Multi-Family new construction study in Massachusetts, there was a substantial difference between overall penetration rates and those for the rental market. Do you know of any products programs designed specifically for renter or Multi-Family markets? Do you think focusing products programs specifically on those markets could be valuable?

46. Is there anything else you'd like to add that we haven't addressed?

Those are all the questions I have. Thank you for your time!

C&I Massachusetts Boiler Market Characterization Study
Phase II: Manufacturer Feedback Form Template

Summary of Phase One report findings

The Phase One report yielded the following key findings (shown in the table below) regarding the small commercial & industrial (C&I) gas boiler market in Massachusetts. The Phase One study defined small C&I boilers as those boilers that range in size from 90 to 2,000 MBH and are installed at a business or other non-residential location. We recognize that different manufacturers may employ different definitions of commercial boilers, however we request that you use our definition when preparing your responses to the questions.

Characteristic	Estimated Value	Estimated Percentage Value
Estimated annual sales of all 90 – 2,000 MBH gas boilers to C&I customers in Massachusetts in 2012 (all manufacturers combined)	1,500 - 3,000 boilers	
Estimated annual sales of 90 – 2,000 MBH ***condensing*** gas boilers to C&I customers in Massachusetts in 2012 (all manufacturers combined)	900 – 2,400 boilers	60% to 80% of all C&I gas boiler sales were condensing models in 2012
Number of MassSave program rebates provided for 90 – 2,000 MBH condensing gas boilers to C&I customers in Massachusetts …		
… in 2012	675 rebates	23% to 45% of all C&I gas boiler sales received rebates in 2012
… in 2013	835 rebates	

The following link provides access to the entire Phase One report: http://ma-eeac.org/wordpress/wp-content/uploads/CI-Boiler-Market-Characterization-Study-Final-Report.pdf

The Massachusetts Energy Efficiency Program Administrators are seeking to improve the MassSave program design and to better understand the type and efficiency of small C&I gas boilers available in the market. Your company's experience and knowledge of the Massachusetts boiler market will help inform this study as well as the future design of the MassSave programs.

Please review each of the following questions and provide a response in the box where indicated. Please be assured that we will maintain the confidentiality of your responses and will only present results in aggregate after removing all identifying information.

All Gas Boiler Sales

The Phase One report estimated that annual sales of 90 – 2,000 MBH gas boilers to C&I customers in Massachusetts in **2012** ranged from 1,500 to 3,000 units.

1a. What is your best estimate of the annual sales of 90 – 2,000 MBH gas boilers to C&I customers in Massachusetts in **2013**?
Please provide a specific point estimate (i.e., 15) if possible, though a range is useful as well (i.e., 10 to 20).

Please type your response here:

1b. What key factors did you consider in developing this estimate?

Please type your response here:

Condensing Gas Boiler Sales

The Phase One report estimated that annual sales of 90 – 2,000 MBH condensing gas boilers to C&I customers in Massachusetts in **2012** ranged from 900 to 2,400 units.

2a. What is your best estimate of the annual sales of 90 – 2,000 MBH condensing gas boilers to C&I customers in Massachusetts in **2013**?
Please provide a specific point estimate (i.e., 15) if possible, though a range is useful as well (i.e., 10 to 20).

Please type your response here:

2b. What key factors did you consider in developing this estimate?

Please type your response here:

Annual Sales Forecasts

3a. Which types (i.e., efficiency tier) of 90 – 2,000 MBH gas boilers does your company currently produce for C&I customers?
3b. Which type (i.e., efficiency tier) of 90 – 2,000 MBH gas boiler represents the most sales to C&I customers in Massachusetts?
3c. What is the forecasted annual sales increase or decrease your company is currently using for future sales of 90 – 2,000 MBH gas boilers to C&I customers in Massachusetts (or alternatively for New England or the northeastern U.S.)?
Please provide a specific point estimate (i.e., +3%) if possible, though a range is useful as well (i.e., +2% to +4%).

Boiler type, among 90 – 2,000 MBH gas boilers for C&I customers	**3a. Does your company currently produce this type of boiler?**	**3b. Which type of boiler does your company sell most of in Massachusetts?** *(Check only one box in this column)*	**3c. What is the annual forecasted sales increase or decrease for Massachusetts?** *(for example: +3% or -3%)*
Standard-efficiency models (<85% efficiency)	*Yes / No / Don't Know*		Please type your response here:
Mid-efficiency models (85%-90% efficiency)	*Yes / No / Don't Know*		Please type your response here:
High-efficiency condensing models (>90% efficiency)	*Yes / No / Don't Know*		Please type your response here:

Standard Efficiency Boiler Production

4a. If your company currently produces 90 – 2,000 MBH gas boilers of 85% efficiency or less, does your company ***intend to continue*** producing these models in the future?

Yes / No / Don't Know

4b. What key factors might trigger a decision to discontinue production of <85% efficient 90 – 2,000 MBH gas boilers?

Please type your response here:

Additional Feedback

5. Would you or someone from your company be interested in participating in a "Massachusetts Boiler Roundtable" meeting this Spring where stakeholders and program administrators discuss the commercial gas boiler programs and market for a few hours?

Yes / No / Don't Know

6. Do you have any other comments or feedback you would like to share about this study, the Phase One report, or the MassSave programs?

Please type your response here:

Please save this document and email it to Joanne O'Donnell from NMR Group at jodonnell@nmrgroupinc.com.

Thank you for your time! We appreciate and value your feedback.