

PREPARED FOR THE ENERGY FOUNDATION

Building Retrofit and Industry Market (BRIM) Initiative

Reactions to the Residential Retrofit Roundtable Recommendations

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1 EXECUTIVE SUMMARY

In the summer of 2012, the Energy Foundation sponsored five Building Retrofit and Industry Market (BRIM) roundtables to identify ways to scale up energy efficiency retrofits in various markets: commercial office, commercial retail, health care, multifamily, and single-family residential.¹ The BRIM residential expert panel identified three top approaches to drive the uptake of residential retrofits, including: 1. develop state roadmaps, 2. develop and promote new models for utility cost-effectiveness, and 3. develop programs to drive consumer demand. This panel also identified the top three research areas that could help support these approaches, including: 1. develop a methodology for full substantiation of non-energy benefits (in support of the utility cost-effectiveness tests), 2. prepare case studies of best and worst practices for program delivery, and 3. research the consumer decision-making processes.

Energy Futures Group (EFG) was engaged to explore these top approaches and research needs in more depth with residential retrofit experts from North America. EFG identified about 30 experts including program managers, home performance contractors, consultants, advocates, entrepreneurs, executives and government officials, and was graciously given between 30 and 90 minutes of time each from 27 of these experts to complete an in-depth interview. These interviews were compiled and then summarized anonymously in this report which addresses responses to these top three approaches and the top three research areas, the role that philanthropy could play in supporting these efforts, cross-cutting themes, geographic areas of focus and leaders who could make a difference in the residential market.

This report synthesizes the responses from the interviews, provides direct (anonymous) quotes from the interviewees in support of particular points and issues, and includes the authors' reactions and perspective. A summary of the report follows:

Role of Philanthropy: There was near universal consensus that philanthropy could assist in scaling up the retrofit markets. While the specific recommendations varied by interviewee, suggestions included providing a focus on the big-picture climate issues and economic development opportunities through support of advocacy, regulatory changes, research and demonstrations. As a facilitator, philanthropy could also bring together groups and individuals to share ideas and strategies, resulting in showcasing some of the best, worst and replicable practices from the field. There was also support for philanthropy funding initiatives that would help all retrofit programs (by funding such efforts as a database of all programs with comparison metrics) in addition to supporting individual successful programs.

Ultimately, philanthropy could play a transformative role in its support of big, innovative and successful ideas by leveraging its influence and funding to effect change at the highest levels while also ensuring support of proven initiatives on the ground. Across the board, the philanthropic community is poised as a key partner in the residential retrofit effort.

Potential Approaches: The first recommendation from the BRIM expert panel was to prepare state roadmaps, including investigating how a self-sustaining program can be launched and maintained,

¹ Recommendations from all five roundtables can be found in the report, "Report on Expert Recommendations to Increase the Pace and Scope of the Building Retrofit Market." Forthcoming. Contact authors for full report.

developing business models, training and supporting leadership. The interviewees generally agreed that developing a statewide plan rose to the top of the list of priorities, but they also provided caveats and suggestions for ensuring its success. Again, starting with the big picture climate issues and emissions reductions as a focus in any roadmaps was encouraged. Additional suggestions included moving plans into action through advocacy and legislative and regulatory support, while taking into account state-specific issues and circumstances in the process. Developing roadmaps can be an effective tool, provided they flow from the highest-level policy goals, address total and sector-level energy efficiency targets needed to achieve these objectives, and, finally, lay out specific strategies to achieve these targets.

The second BRIM recommended approach was to develop and promote new models for utility cost-effectiveness tests. This was recognized by most as a high-priority focus, especially by those involved in designing, administering and implementing retrofit programs. Current tests used to justify energy efficiency programs fully capture the costs to deliver those programs, but do not account for all of the benefits. Interviewees made suggestions on expanding and quantifying the benefits, considering alternative tests and shifting the focus away from using just these tests in order to justify the programs. Following a theme throughout these conversations, many agree that a shift in framework towards one in which climate goals are more fully considered could potentially help address this issue.

The third recommendation was to develop programs to drive consumer demand. While there is general agreement that more demand is necessary in order to scale up residential retrofits, there is clearly some difference of opinion about how to do so, who should deliver the message and just what that message should be. Many interviewees promote driving demand in partnership with private sector contractors. At the same time, there is clearly a role for the public sector, though some interviewees suggested that this role should be at a higher level than direct funding of programs, focusing more on things like increased incentives and other ways to make the industry more profitable, as well as regulation and other mechanisms to achieve scale. In order for consumers to value and therefore demand energy efficiency, some interviewees advocated for labeling and rating mechanisms that capture this information though others question the effectiveness of these types of mechanisms.

Research Needs: Interviewees were asked about the top three research needs that were identified by the BRIM roundtable. The first topic was to fully substantiate the non-energy benefits (NEBs) left out of the utility cost-effectiveness tests. Many interviewees agreed that this research is very important. While quantification of these NEBs will help to ensure that these tests are applied more accurately, some also noted that better understanding these currently unquantified benefits could also help market home energy improvements and drive demand. While the costs of assessing accurate values for some benefits (e.g., comfort, increased health and safety) is challenging, at least those benefits that are readily calculable (e.g., water and all fuel savings) should be captured. Interviewees and the authors noted, again, that it may ultimately be appropriate to move away from cost-effectiveness screening and assess programs instead primarily on the basis of how effective they are likely to be as climate change mitigation strategies.

The second priority research topic was to develop case studies. Interviewees noted that there has already been some good work done through DOE's Better Building Neighborhood Program and other

programs to develop case studies. There were suggestions about how future case studies could be made more effective, such as establishing a national database or clearinghouse to allow easy access and comparisons using objective, quantifiable metrics. Interviewees also suggested including “worst practices” in addition to “best practices,” as well as including contractor case studies in addition to case studies on programs.

The third area interviewees reacted to was the suggestion to research the consumer decision-making process. Interviewees noted that some work has already been done or is ongoing. Some argued that more research is needed to drive demand, and the authors concur with this view. However, others felt that the work that had been done so far had not produced significant results and that perhaps other approaches were more critical.

Cross-Cutting Themes: The BRIM Report identified a number of “Synergies” and “Common Themes” that were mentioned by multiple participants in the various roundtables from different sectors of the building market. Some of these areas seemed as though they would benefit from cross-sectoral approaches, such as building labeling and disclosure initiatives, active utility engagement, and perhaps some types of financing mechanisms. Other areas may require sector-specific approaches, such as consumer decision-making and mechanisms to drive demand.

Geography: Interviewees were asked about whether they might suggest particular locations for philanthropy to focus their efforts due to particularly promising programs, leaders or organizations. While there was no consensus among the interviewees, many had some helpful suggestions as philanthropy considers where best to direct resources. Some of these suggestions include using different approaches for leading states, laggards, and those in between; focusing on areas with high heating and/or cooling costs; continuing to support promising Better Buildings Neighborhood Programs; exploring states in which an “energy efficiency utility” model could be effective; and focusing on common building types instead of jurisdictional boundaries.

Leaders: Some interviewees volunteered names of leaders and organizations they felt could be worthy of philanthropic support in the pursuit of scaling up residential retrofits. While many other effective and worthy advocacy organizations are listed and supported by the authors, two organizations were mentioned more than others. The retrofit contractors’ trade association “Efficiency First” was noted by many, especially in light of all of the comments about ensuring a strong partnership between programs and the private sector. The other suggestion worthy of mention was the idea of creating a new organization focused on integration of energy efficiency in the real estate sector by focusing on home values and the mechanisms that would support that progress, including labeling and disclosure.

The authors appreciated the opportunity to conduct the interviews and spend precious time with this country’s residential retrofit leaders. We are sincerely thankful to each of the interviewees and their willingness to share their expertise, experience and scarce time. We provide our reflections and synopsis for each of the major sections summarized above throughout the detailed report that follows.

2 PURPOSE AND PROCESS

The Building Retrofit and Industry Market (BRIM) working group, coordinated by the Energy Foundation and formally engaging six philanthropies,² held a roundtable in the summer of 2012 with experts representing different stakeholders relevant to the single family residential sub-sector of the building market. In addition, four other roundtables were held for other sub-sectors of the building market-- commercial office, commercial retail, multifamily and health care. The purpose of the roundtables was to see what philanthropies - and others - might do to seize opportunities and address the challenges in order to rapidly increase and scale the energy efficiency retrofit market for buildings in the United States. The experts identified and discussed many policy and program approaches to go to scale and were asked in conclusion to recommend their top three approaches along with the top three research needs to assist implementing those approaches.

The top three approaches identified by the single family residential expert roundtable were as follows:

1. Develop State Roadmaps: Investigate how a self-sustaining program can be launched and maintained; identify leaders and build advocates. Develop business models; train in areas other than retrofit technologies and techniques including business training, marketing training, and lender education. Focus on low-moderate income families.
2. Develop and Promote New Models for Utility Cost-Effectiveness: De-coupling has not been adopted in many states, and there are few real utility incentives to promote energy efficiency in most states. Examine how non-energy benefits from energy efficiency retrofits can be incorporated into utility cost-effectiveness tests, and develop new models for utility cost-effectiveness tests. Work to educate regulators, legislators, and others on the benefits of these expanded tests.
3. Develop Programs to Drive Consumer Demand: Promote benchmarking or rating—incorporated into Multiple Listing Services (MLS); improve marketing and sales tactics; promote open access to utility data and obtain data to analyze it in combination with existing program successes; explore innovative measures to interest customers; build a strong ad campaign linking energy efficiency to other national goals; be innovative – look internationally for inspiration; develop programs at key points in the life-cycle of the home; understand better who is taking advantage of utility, tax incentive and other programs and why, then replicate it and expand.

The top three research issues identified by the expert roundtable were as follows:

1. Develop a Methodology for Full Substantiation of Non-Energy Benefits: Document the impact of energy efficiency retrofits on jobs economic development; home value; health. Understanding this is needed to enhance utility programs; access economic development funds. Perhaps develop a methodology using standard development process like ANSI for credibility.
2. Prepare Case Studies: Document best and worst practices for program delivery through case studies, and document the impacts of energy efficiency retrofits on homeowners.

² These philanthropies are the Energy Foundation, Doris Duke Charitable Foundation, Kresge Foundation, Living Cities, MacArthur Foundation and Rockefeller Foundation. Several other foundations are informally following the insights obtained from this effort.

3. Research Consumer Decision-Making Process: Obtain a better understanding of what drives consumer behavior to do energy efficiency retrofits and how to then integrate these factors into seamless program of marketing delivery with financing options. Speak with utilities, market research firms, others.

All of the recommended approaches and research priorities for the residential sector, along with the results of the other sub-sector roundtables, are detailed in the “Report on Expert Recommendations to Increase the Pace and Scope of the Building Retrofit Market.”³ That report also highlights common themes that ran across all of the sub-sector roundtables.

The purpose of this follow-up report is to test the single-family residential roundtable’s top-three recommended approaches and research priorities with an array of leaders within the residential field, obtain their views on the interventions required to build the retrofit market within particular geographies and nationally, and produce a set of recommended actions on the part of (1) philanthropy and (2) to the extent appropriate or identified, other market participants, to bring the retrofit industry to scale with a goal of “deep” retrofits.⁴

EFG identified 27 prominent leaders in the residential home performance industry and related fields for interviews. The interviewees were asked whether they agreed that the approaches that emerged from the roundtable were the most promising, whether they identify problems with them, and whether they could identify other approaches or research issues that should be prioritized. In addition, the interviewees provided their thoughts on promising geographic locations in which to pursue these approaches or research priorities, as well as to identify other leaders who could play an active role in these efforts.

These experts were also asked about specific roles that the philanthropic community could play in efforts to bring the industry to scale. We begin the report by summarizing the recommendations from the interviewees on the potential roles that philanthropy can play in the residential sector. The remainder of this report then provides a summary of findings on the potential approaches, research priorities, cross-cutting themes, geographic focus area and industry leaders to pursue. Appendices listing the interviewees and an interview guide are included at the back of this report.

³ [Forthcoming](#), Contact authors to obtain full report.

⁴ While there may be no industry consensus on the meaning of “deep” or “scale,” the philanthropies extensively discussed what the terms “deep” retrofits and “scale” would mean in the context of this project. Rather than selecting a precise energy-reduction figure as “deep,” they agreed that a “deep energy retrofit” is a systematic approach that considers both building operations and a comprehensive list of technologies, including the building envelope—and that it should be considered periodically over time and not as a one-time event. Several definitions of “scale” were considered, including the percentage of a local or national market served. They agreed that scale would reflect a significant and steady increase in the amount of capital—particularly private capital—being devoted to the retrofits of buildings as part of an evolving, self-sustaining market. See “Report on Expert Recommendations to Increase the Pace and Scope of the Building Retrofit Market,” p. 3. The concept of “deep” was given less emphasis in the follow-on interviews summarized here, while “scale” was likely interpreted on a somewhat more individual basis by the various interviewees.

3 ROLE OF PHILANTHROPY

Interviewees were asked to identify potential roles that philanthropy could play in the residential sector to help scale the market and to place those efforts in the context of the broader array of activities that must occur for the building retrofit market to succeed. Their responses were wide ranging and are summarized below:

3.1 Focus on Big-Picture Issues and Use Big-Picture Strategies

Several of the interviewees suggested that the philanthropic community should play a role in focusing on big-picture issues that could help shift the home performance industry in fundamental ways. One interviewee noted that while much of the work in this sector is done at the state level or within a utility-service territory, philanthropies could bring a national, cross-cutting perspective to all of the efforts to bring residential retrofits to scale. As he put it, “Foundations can look nationally or beyond. A particular utility tends not to look beyond its own service territory, and even a utility board tends not to look beyond its jurisdiction.” Another interviewee supported the notion that philanthropies should focus on big-picture issues like advocating for a national directive on climate reduction and helping establish a carbon trading scheme.

In addition to focusing on big-picture issues, some interviewees suggested that philanthropies should “take the long view” and use big-picture approaches that could improve the industry with significant, fundamental changes rather than gradual improvements. For example, one interviewee suggested looking to the X Prize Foundation for inspiration, which pools the resources of multiple philanthropic sponsors to attract proposals for large-scale projects that will address “the world’s grand challenges.” He also suggested looking for inspiration from the Climate CoLab run by MIT’s Center for Collective Intelligence, which allows people to collaborate across the world and propose solutions to fundamental questions like, “What should we do about climate change?”

3.2 Advocate for Legislative, Regulatory, and Other Changes

A key role that philanthropy could play would be one of advocacy. This could involve advocating directly for legislative, regulatory or other changes, or, as some interviewees suggested, supporting advocates who are already doing some of this work or are well-positioned to carry it out. One consultant stated “One of the key roles is supporting the advocacy community in trying to put the right policies in place. Maybe some demonstration projects of innovative approaches, deep retrofit technical methods or marketing approaches.” Another contractor interviewee suggested that philanthropy could help advocates get more recognition, access to leaders, and give them a voice on the national stage.

3.3 Play a Facilitator Role

Philanthropy is also well-suited to bringing the right people together. As was shown through the BRIM process, enabling gatherings and supporting travel and meeting can help facilitate discussion and the movement of ideas. Additionally, as some contractors interviewed suggest, philanthropy could be well suited to support contractor-to-contractor and program-to-program mentoring training and information sharing.

3.4 Fund Research and Demonstrations

Philanthropy can help fund demonstration projects that serve to inform the industry and consumers. This could include projects that range as widely as new technologies or building science-based retrofit approaches, quantification of non-energy benefits for use in utility cost-effectiveness tests, or exploration of consumer behavior around energy retrofits. Another area not adequately supported by any other group currently and which a number of interviewees called out as needing attention is home values and energy efficiency. Better understanding how markets value energy efficiency and providing this information to the real estate and lending communities could help with this important component of the residential market.

3.5 Fund Programs

Philanthropy could also provide funding the enable programs to succeed. One interviewee involved with Department of Energy's (DOE) Better Buildings Neighborhood Program (BBNP) suggested that bridge funding could help move successful pilot programs to scale. Another interviewee suggested using philanthropic funding as leverage to get programs to work collaboratively and share best practices.

3.6 Showcase Best , Worst and Replicable Practices

While DOE and others have developed case studies of best practices, some interviewees stated that it would also be useful to fully understand why certain programs did not succeed. Additionally, case studies on replicable models (e.g. Clinton Foundation's Home Energy Affordability Loan) that could be established in other similar situations should be developed for replication. Philanthropy could help support these types of efforts.

3.7 Support a Program Database and Metrics

There are currently some stated needs across programs and states that the DOE has not yet fulfilled that philanthropy may in order to help track, compare and advance retrofit programs. While DOE has focused on their own BBNP participants and the Consortium for Energy Efficiency has information from its members, there is no publically available national database of all the existing local, state, utility and regional residential retrofit programs. As a result, it is currently impossible to compare programs on an apples-to-apples basis to understand how each is performing and why. An objective and comparable set of metrics (e.g. program participants/local household, savings/participant, conversions from audit to retrofit, etc.) would be very useful as programs try to understand how they are doing relative to other programs and how they can improve. Developing and maintaining such a national database would be a of tremendous benefit.

3.8 Focus on Going "Deep" Rather Than "Wide"

One interviewee said it well: "What we don't need are lighthearted attempts to solve everything you've identified. Whatever you're going to do, go focus on that thing and do it well. It's a lot of little issues. Too often people try to take on the whole thing, and you just see them waste money, waste effort." At the same time, all acknowledged how hard cracking the residential retrofit

market has proven to be. It will take a concerted and focused effort to figure it out and move it to the point where it is really “scaling up”.

3.9 Collaborating with the Private Sector and Government Agencies

There appear to be opportunities for philanthropy to collaborate with the private sector and government agencies in many areas. Some of these are listed above in this section and other ideas are mentioned later in this report. In pushing for progress towards the big climate goals, philanthropy is well suited to help support an “X Prize” for residential energy efficiency or fund research such as MIT’s Climate CoLab. New and innovative partnerships are going to be needed if we are going to solve the climate issue.

3.10 Consultants’ Take

We are strongly supportive of the notion that philanthropy can take a big-picture view toward achieving scale, and we would encourage philanthropic organizations to explore actions that would be motivated by this perspective. For example, we were intrigued by the idea that philanthropies could come together collaboratively to pool resources and solicit large-scale, transformational proposals to take the industry to the next level. We also feel that the philanthropic community should support high-level policies that can move the industry forward, such as utility decoupling and improved shareholder incentives, aggressive energy efficiency portfolio standards, energy labeling and disclosure requirements, changes to mortgage underwriting standards to account for energy expenditures, and perhaps even required energy efficiency upgrades.

Similarly, we believe that philanthropy should support research that could potentially be transformative, such as rigorous studies demonstrating whether mortgage default rates are indeed lower among homeowners whose homes are more energy efficient. If a strong correlation were found, such research could potentially lead banks across the entire market to offer lower rates for homes that were more energy efficient. Additionally, if philanthropy enabled the development of a new or enhanced cost-effectiveness approach that addressed previously unquantified impacts or considered the broader climate change implications, this could also be transformative.

While these big-picture approaches and research topics are in real need of support, we would also encourage the philanthropic community to continue facilitating ongoing work to advance residential energy efficiency in incremental but important ways. These efforts could include funding demonstration programs to prove out some of the concepts discussed throughout this paper, as well as documenting and quantifying information on existing programs to allow for more objective cross-program comparisons. All of this work is important in the overall effort to advance the residential energy efficiency industry, and we encourage the philanthropic community to engage as a key partner in that effort.

4 POTENTIAL APPROACHES

This section summarizes the interviewees' responses to the top three residential retrofit approaches identified by the expert Roundtable, which are to prepare state roadmaps, develop and promote new models for utility cost-effectiveness and develop programs to drive consumer demand.

4.1 Prepare State Roadmaps

This section summarizes the interviewees' responses to the residential roundtable's first recommended approach:

Develop State Roadmaps: Investigate how a self-sustaining program can be launched and maintained; identify leaders and build advocates. Develop business models; train in areas other than retrofit technologies and techniques including business training, marketing training, and lender education. Focus on low-moderate income families.

4.1.1 Focus on the Big Picture: Emissions Reduction Targets

Several interviewees noted that roadmaps should be designed around a "big picture" view of what needs to be accomplished with residential energy efficiency, such as the number of homes that must be retrofitted within a certain timeframe in order to reach particular climate goals. As one consultant put it, setting a goal should be considered the "single most important aspect" of state roadmapping. Otherwise, states run the risk of designing the roadmap around pre-conceived notions of what is feasible, rather than first looking at the end point and then deciding how to get there. Similarly, another consultant supported the notion of developing state roadmaps but noted that before a state can define a roadmap, it must decide where it is going.

Some interviewees felt that the goals of most states were much too low, although certain states were more aggressive. One consultant pointed to California as a leader in setting aggressive targets, in light of the passage of Assembly Bill 32 in 2006, which set a 2020 greenhouse gas emissions target into law and called for the development of a strategic plan to reduce emissions to meet that goal. The goal included a target of 40% savings in all homes by 2020, which was driven by the Intergovernmental Panel on Climate Change (IPCC) estimate of what must be done to hold the carbon level constant initially and then gradually bring it down. This strategic goal translated into a mandate to achieve 40% savings in 13.5 million homes, including approximately 8 million single-family homes, with an 80% reduction by 2050. The scale of the strategic goals led the state to realize that it would need to achieve every bit of energy efficiency it could find, including comprehensive retrofits of existing homes. The consultant remarked that when goals like these are set with a view toward what must be achieved to reach emissions reductions targets, the question of what a roadmap should address changes significantly. Therefore, he recommended that state roadmaps should first set clear targets and timelines linked to climate goals and then fill in the details of how to get there.

4.1.2 Advocate for Legislation to Support Roadmap Strategies

Several interviewees suggested that philanthropies could play a role in advocating for legislation or supporting advocates that would work to make state roadmaps more powerful by codifying the targets in statute and providing additional leverage for energy efficiency advocates. For example, one consultant pointed to the Green Communities Act in Massachusetts, which requires program administrators to capture all cost-effective energy efficiency. He noted that this type of legislation can give energy efficiency advocates a lever if they need to approach regulators to argue that program administrators are not being sufficiently aggressive with their energy efficiency programs.

Another interviewee, an entrepreneur who had recently traveled to an energy efficiency conference in Europe, pointed to the Energy Performance of Buildings Directive in Europe that required all 29 member states to enhance their building regulations and to introduce energy disclosure and labeling schemes for all buildings. He suggested that similar national legislation in the U.S. would bring consistency to state roadmaps while advancing energy efficiency as a national priority.

4.1.3 Work to Achieve Necessary Preconditions

Some observers felt that whether a roadmapping exercise would be valuable in a given state would depend on what other conditions were already in place in that state to support energy efficiency initiatives. For example, one energy efficiency advocate argued that unless decoupling was already in place, such that utility profits were not necessarily tied to the amount of fuel sold, then utility interests would probably be too diametrically opposed to the interests of other parties to allow a roadmapping process to be productive. In such cases, this advocate argued that it would make more sense first to advocate for foundational preconditions such as decoupling and then to pursue state roadmapping once these preconditions had been achieved.

Other interviewees also pointed to additional elements that must be in place in order for a roadmapping exercise to be fruitful in practice. Interviewees pointed to adequate public support, as well as the identification of an effective champion, as examples of necessary elements for carrying out the strategies that state roadmaps lay out.

4.1.4 Address State-Specific Circumstances

Several interviewees cautioned that state roadmaps should pay careful attention to different circumstances in different states, as well as varying local market conditions within a given state. For example, one consultant noted that strategies outlined in state roadmaps should account for state-specific factors such as utility rates, climate, building stock, homeownership and rental rates, average and disposable income levels, and existing level of market activity. A marketing expert interviewee noted that performing a specific assessment of every new market and adjusting the roadmap accordingly should be a precondition to moving forward with any program design. Another interviewee who worked as a program administrator remarked that while some markets may have made progress toward residential energy efficiency goals, others may not have any program administrator in place or even an established funding source. Even

in such markets, however, this interviewee suggested that there may be appropriate strategies to advance residential retrofits, such as educating HVAC contractors on the benefits of a whole-house approach.

Another interviewee who ran a local energy efficiency program commented that it can be a big leap to try to apply successful strategies from one area to an entire state. Even if the general business model is similar, there may be different circumstances in each local market that require a different approach to implementation.

4.1.5 Recognize Potential Pitfalls

Several interviewees also pointed out potential pitfalls of state roadmapping processes. For example, one consultant noted that the concept of the “state” in “state roadmapping” sometimes excluded established utility programs. He observed that in the few years since the passage of the American Recovery and Reinvestment Act (ARRA) in particular, state and local governments had experimented with energy efficiency programs on their own, without incorporating the experience of traditional utility-administered energy efficiency programs. This interviewee felt that such approaches could lead states to put forward independent strategies that might conflict with those of existing utility programs. In addition, he noted that recent state roadmaps, relying on short-term injections of federal stimulus funding, often led to short-term programs. In his view, utilities tended to have the ability to conduct longer-term planning, which could provide more certainty to the market.

Another contractor went so far as to say that roadmaps are a “big waste of time.” This contractor felt that within a state, it is very difficult to get people to agree on what the roadmap should look like and that the strategies laid out in such roadmaps tend to be convoluted. For example, the contractor noted that even the varying processes of becoming a home performance contractor within different states “will make your eyes roll back.” This contractor, who was working in three different states, noted that she had heard stories from each state that would “go on for hours” regarding how hard the state had made it to get a license to work in people’s homes, or to knock on doors and conduct outreach in specific towns. She felt that there were too many constituencies to create a coherent roadmap and that the roadmaps in the states she was working in were not consistent. As she put it, “If you can get all those constituencies to agree on anything, that’s great, but I don’t see that happening.” She acknowledged that the idea of a roadmap made sense in theory, but she felt that it was very difficult in practice because of all the different agenda items that different constituencies want from the roadmapping process. Given these difficulties, she felt that if someone simply sat down and said, “This is the roadmap” without any stakeholder input process, it would be a lot easier to move forward in that market.

4.1.6 Use Caution Regarding Public-Sector Business Models

Noting that the Roundtable recommendation on state roadmaps included the phrase “develop business models,” several interviewees remarked that it would be more effective to support contractor growth from the bottom up than to design top-down business models from within

the public sector that the contractor industry would be expected to follow. One consultant put it bluntly: “Programs should not develop business models. They’re terrible at that.” Several interviewees suggested that it would be more effective to help contractors develop their own business models instead as an alternative “private sector solution.”

4.1.7 Consultants’ Take

We would suggest that preparing state roadmaps can be an important step in advancing energy efficiency retrofits in the residential sector and other sectors. We agree with those interviewees who stated that the strategies outlined in state roadmaps should flow directly from high-level climate-related goals. State roadmaps can be thought of using a pyramid or flow-chart structure, starting at the highest level with long-term climate objectives, then outlining total and sector-level energy efficiency targets needed to achieve those objectives, and finally laying out specific strategies necessary to reach those energy efficiency targets. Without tying the strategies outlined in a state roadmapping process into bigger-picture goals, there will be no clear way to judge whether such strategies are the right ones to pursue.

At the same time, we believe that pursuing certain additional initiatives in parallel with a roadmapping process is likely to make such a process more effective. For example, we agree with those interviewees who maintained that codifying long-term climate objectives and related energy efficiency goals into legislation will add weight to any roadmap’s recommendations. Other types of legislative or regulatory actions may also improve the chances of moving forward with an aggressive energy efficiency strategy within a state. Such actions might include a legislative requirement to pursue all cost-effective energy efficiency before procuring other supply-side resources, as well as regulatory changes to implement decoupling and shareholder incentive programs. While certain interviewees argued that some regulatory changes, such as decoupling, are necessary preconditions to a successful state roadmap, we believe that identifying these necessary steps can in some cases become part of the roadmapping process itself.

We agree that state roadmaps should take specific market circumstances into account at both the statewide and local levels. In assessing the market, the roadmapping process should take into account what utility or other programs may already exist in a state, as well as what objectives and strategies have been laid out in the utility planning cycle. Strategies outlined in the state roadmapping process should be careful not to undermine or simply recreate strategies that are already being pursued. Rather, it should be clear how the strategies outlined in the roadmapping process will support or enhance ongoing efforts. At the same time, we agree that supporting private-sector business models may be a more effective strategy in the long run than attempting to establish or bolster public-sector models.

Philanthropy is in an excellent position to identify the most effective roadmap approaches for different circumstances and then develop models and tools that could help optimize tailored approaches. By providing tools, guidance and examples of the most effective approaches, philanthropy could help make roadmapping even more effective.

4.2 Develop and Promote New Models for Utility Cost-Effectiveness Tests

This section summarizes the interviewees' responses to the residential Roundtable's second recommended approach:

Develop and Promote New Models for Utility Cost-Effectiveness: De-coupling has not been adopted in many states, and there are few real utility incentives to promote energy efficiency in most states. Examine how non-energy benefits from energy efficiency retrofits can be incorporated into utility cost-effectiveness tests, and develop new models for utility cost-effectiveness tests. Work to educate regulators, legislators, and others on the benefits of these expanded tests.

4.2.1 Shift the Framework: Evaluate Programs Based on Climate Goals

While most interviewees understood why cost-effectiveness tests rose to the top of the Roundtable's list of issues, many interviewees asserted that revising current cost-effectiveness screening models may ultimately be less important than changing the lens through which energy efficiency programs are assessed to focus more directly on climate change goals. For example, one building performance expert argued that while revising new cost-effectiveness tests may be important within the current environment, it may become less important if the energy efficiency industry eventually moves beyond regulated utility programs as the primary method of achieving long-term goals. Similarly, one consultant contended that while cost-effectiveness screening matters today, it may not be as important as developing goals for emissions reductions and advocating for government commitment to achieve those goals through regulation and incentives. As he put it, "In the long run, a commitment to carbon mitigation may be more important than changing cost-effectiveness screening."

Some interviewees pointed out that certain leading states had already made efforts to widen the parameters of existing screening tests but suggested that they need to rethink program and portfolio assessment from a more fundamental standpoint. For example, one program administrator noted that in Vermont and Massachusetts, cost-effectiveness screening is conducted at the portfolio level, which allows more flexibility in terms of the measures and programs that can be pursued. In addition, the benefits side of Vermont's cost-effectiveness screening equation includes an "add-on" for non-energy benefits and an additional add-on for low-income programs. Yet this interviewee felt that the industry should move toward evaluating portfolios in a new way, with a greater emphasis on climate change. As she put it, "The next frontier is looking at how we can meet the country's long-term climate goals, which goes beyond simply treating efficiency as a resource."

Another interviewee with international experience noted that the emphasis on expanding cost-effectiveness tests is tied to a U.S.-centric presumption that energy efficiency will be achieved through utility programs, which tends to shift the focus away from reducing greenhouse gas emissions. This consultant commented that the U.S. has focused for a long time on using regulated utility mechanisms for demand-side management as the primary way to achieve energy efficiency, with the exception of low-income weatherization, which has a long history of being a federally funded program. The interviewee noted, however, that in other countries,

such as Canada, there are much more comprehensive and federally funded programs, which come with certain advantages. One of these is that national programs tend to be focused more directly on achieving emissions-reduction goals. For example, this interviewee noted that when the Canadian federal government decided to provide incentives for energy efficiency in 2003, they did not subject programs to the same type of cost-effectiveness tests as are common in the U.S., because “ultimately the federal government was really buying carbon reduction.” Advocates were able to compare efficiency programs to other carbon reduction mechanisms that would cost the government anywhere from \$5 to \$500 per ton, whereas the cost for carbon reduction through energy efficiency was demonstrably negative. Given the primary goal of the federal government to reduce carbon as cost-effectively as possible, this type of higher-level comparison was sufficient to green light the incentive programs.

4.2.2 Expand the Range of Benefits Included in Cost-Effectiveness Screening

While many interviewees emphasized the importance of shifting toward a more climate-focused framework for program evaluation, several interviewees nonetheless pointed to the need to expand the range of energy and non-energy benefits incorporated into cost-effectiveness screening tests as a key priority as long as those tests remained in place. One energy efficiency advocate suggested that this effort might represent a slight variation on the Roundtable recommendation of promoting “new” models for cost-effectiveness, focusing instead on making the existing models more accurate. However, such an approach would still include a thorough examination of the values and assumptions that are used in the existing tests, as well as those elements that are left out.

A number of industry observers highlighted the recent decline in natural gas prices as adding a degree of urgency to this issue, given that measures and programs might experience more difficulty passing cost-effectiveness screening on the basis of avoided-cost benefits alone. As one consultant put it, “In today’s world, where natural gas prices are plummeting, revising cost-effectiveness screening is particularly important. In most places, home energy retrofits are primarily focused on heating and cooling, and in most places, heating is dominated by gas.” Another program manager pointed out that something is very wrong with the current cost-effectiveness tests when “insulating empty sidewalls in homes in locations where it’s cold and snows doesn’t screen” and blamed it on falling natural gas prices.

Similarly, an implementation contractor gave an example of a program that had gone from a benefit-cost ratio of 1.54 to 0.88 as a result of changes in natural gas prices. He noted that it can take years to build up a program and provide the necessary training, as well as to encourage contractors to participate and invest in the necessary equipment. He remarked that if a program is then wiped out because of an instantaneous change in avoided costs that cause the program not to screen, program administrators must immediately focus on how to make the program more cost-effective using the existing screening test. Reworking the program, however, can result in significant changes that may be detrimental to long-term energy efficiency goals. Furthermore, even if the program is suspended for a single year, it may be much more difficult to convince contractors to participate the following year after announcing

that the program is back or that a new program has been established. Given all of the potential negative consequences of screening programs, this interviewee argued that programs should at least be screened using a balanced assessment of all costs and benefits.

As discussed more thoroughly in the section on non-energy benefits as a research priority, some interviewees recognized that quantifying all non-energy benefits could pose a significant challenge. In light of this reality, one consultant suggested distinguishing between those benefits that are readily quantifiable and those that may be more difficult to measure. At a minimum, this interviewee asserted that readily quantifiable benefits should be included in cost-effectiveness tests. These would include benefits of all fuel savings, not only those fuels sold by the utility administering a particular program, as well as other resource benefits, such as water savings. As he put it, “Preventing single-fuel utilities from counting other fuel benefits is a horrible wasted opportunity.” This interviewee suggested that in the short term, philanthropy could focus on advocating for the inclusion of readily quantifiable benefits in cost-effectiveness tests and then move toward quantifying other benefits that are harder to measure over the longer term.

A number of interviewees argued that cost-effectiveness tests should be expanded to include non-energy benefits because these benefits actually drove consumers to make investments in home performance in the first place. One industry representative noted that contractors typically sell energy efficiency projects on the basis of non-energy benefits, yet programs are evaluated on the basis of energy savings, thereby putting contractors and regulators at odds with each other. As another consultant put it, “The current models are broken. They pay no attention to why consumers actually buy things. Consumers are usually interested in everything but the energy benefits.”

4.2.3 Consider Alternative Screening Tests

Given the potentially significant costs of valuing non-energy benefits, one consultant suggested switching to the Program Administrator Cost Test (PACT) instead of the Total Resource Cost (TRC) Test. The PACT (previously known as the Utility Cost Test) measures cost-effectiveness from a utility perspective. It compares the value of the utility’s avoided costs with the cost to the utility of acquiring the efficiency resources that produce those avoided costs. Among other advantages, this test does not require quantification of Non-Energy Benefits (NEBs), which would reduce complexity and controversy and save on NEB evaluation costs that could otherwise be considerable. This interviewee mentioned three states that incorporate the PACT in their cost-effectiveness screening process: Michigan, Utah, and Connecticut. It may be worth following up to gain a better understanding of the experience in these states and the potential consequences of applying this test elsewhere.

4.2.4 Focus on Shareholder Incentives in Addition to Portfolio Screening

One consultant noted that an additional reason to revise cost-effectiveness tests is that they are often used not only to determine what measures and programs can go into a portfolio, but also as the basis for utility shareholder incentives. This interviewee found that in such cases,

there was often in an inherent incentive to “cream skim” by installing measures that produce short-term savings in order to maximize benefit-cost ratios and increase shareholder incentives. Although cost-effectiveness equations typically incorporate lifetime savings, he remarked that because future savings are discounted, there is still a tendency to focus on more valuable short-term savings. He commented that in some locations, such as Ontario, Canada, advocates had successfully convinced regulators to change the way that shareholder incentives are calculated, basing them on actual lifetime fuel savings rather than corresponding discounted cash flows. As a result, the impact of fuel savings in later years had the same impact on shareholder incentives as fuel savings in early years.

4.2.5 Recognize Budget Implications of Expanded Portfolios

A number of interviewees pointed out the budget implications that would inevitably arise if cost-effectiveness screening were expanded to allow for more measures and programs. One researcher argued that promoting more expansive cost-effectiveness tests would only be helpful if public money were also made available to support additional measures and programs. On a related note, a consultant commented that some states have moved toward requiring that program administrators pursue all cost-effective energy efficiency. However, this interviewee noted, “If you do that, you’ll have to raise rates. Raising utility rates is not a popular idea with politicians. You’ll see a lot of foot-dragging.” These comments suggest that in addition to expanding the range of benefits considered in cost-effectiveness tests, advocacy may be needed to support corresponding budget increases.

On the other side of this argument, one local program leader felt that focusing on expanding cost-effectiveness tests placed too much emphasis on increasing incentive levels. As this interviewee noted, “We run into problems when we predicate our success on our ability to buy off our customers with incentives, instead of saying that there is inherent value in investing in energy efficiency.” She questioned whether it would be politically feasible to keep expanding the amount of rebates available simply by promoting new models of cost-effectiveness tests. As she put it, “Are we going to just sit on our hands while we try to convince legislators to convince regulators to convince utilities to provide greater incentives?” She noted that contractors had been performing home performance jobs even before rebates were available, suggesting that the industry could be sustainable even without them. Further, she suggested that in states without incentives, it would be better to help the industry stand on its own two feet. In her words, “Some areas don’t even have the umbilical cord of incentives, so why introduce it?”

4.2.6 Acknowledge Other Barriers to More Aggressive Programs

Despite the emphasis that many interviewees placed on expanding the range of benefits included in cost-effectiveness screening, some interviewees argued that current limitations on cost-effectiveness tests should not be overemphasized as the overwhelming reason that utilities do not pursue more aggressive energy efficiency programs. One energy efficiency advocate, for example, pointed out that in states without decoupling, utilities will lose money every time they spend money on energy efficiency. Thus, utilities in these states will be dug in against energy efficiency measures and programs, even if they can be shown to be highly cost-effective.

Another interviewee contended that the reason utilities do not pursue more energy efficiency often is not that they run up against cost-effectiveness limitations, but rather that valuing energy efficiency simply is not part of their culture. As she put it, “I’ve seen utilities that have the latitude and don’t have the motivation.” She felt that a shift in upper management would likely be needed in order to motivate utilities to pursue energy efficiency more aggressively. She also acknowledged that decoupling might be helpful in shifting utilities priorities to encompass more energy efficiency, but she maintained, “If the values don’t change, decoupling may not help.”

4.2.7 Consultants’ Take

We agree with those interviewees who argued that in the long run, it may make sense to shift away from cost-effectiveness screening as the primary method for determining whether to provide public or ratepayer support for energy efficiency programs. Cost-effectiveness screening is tied into the concept of energy efficiency as a resource alternative to supply-side options. While leading states have generally moved toward broader cost-effectiveness screening options that take a somewhat more holistic approach to assessing measurable benefits, no state has yet established a regulatory framework that screens programs primarily on the basis of their effectiveness in achieving long-term climate-change mitigation objectives. A few states have enhanced their cost-effectiveness screening tools with carbon-related “adders,” but even in such cases, carbon emissions reductions are typically treated as more of an afterthought than as the primary reason to pursue energy efficiency. In theory, cost-effectiveness screens could be significantly revised to give climate-related objectives greater weight. But as the imperative to do something about climate change becomes clearer, it may make more sense simply to shift toward a new framework.

Nonetheless, we realistically recognize that ratepayer-backed utility programs are likely to remain one of the primary delivery mechanisms for energy efficiency in the near term and that such programs will continue to be screened using cost-effectiveness testing. As such, we support the concept of expanding the range of benefits that are counted in cost-effectiveness screening, as several interviewees advocated. In the near term, we believe that all quantifiable benefits of energy efficiency measures and programs, such as water and all fuel savings, should be included in all cost-effectiveness screens. In the longer run, we also support efforts to quantify and incorporate non-energy benefits. We note that some states, such as Massachusetts, have gone through the technical work of quantifying specific non-energy benefits for measures and programs and found them to be significant, while other states, including Vermont, have incorporated conservative blanket “adders” to account for non-energy benefits across the board. We recognize that expanding the number of energy efficiency measures and programs that pass cost-effectiveness screening will ultimately have budget implications. However, ultimately we believe that increased incentives may be a necessary part of meeting climate-related goals.

At the same time, we also understand that quantifying and agreeing upon non-energy benefits can be a challenging and expensive proposition that few other states have been willing to take

on. As such, we also support exploring alternative options such as moving to the PACT test, as one interviewee mentioned. Philanthropy could help fill in some of these gaps by supporting efforts to quantify non-energy benefits, exploring alternative cost-effectiveness tests and pushing beyond our current construct to develop a new test based on climate change as the foundation.

4.3 Develop Programs to Drive Consumer Demand

This section summarizes the interviewees' responses to the residential Roundtable's third recommended approach:

Develop Programs to Drive Consumer Demand: Promote benchmarking or rating—incorporated into Multiple Listing Services (MLS); improve marketing and sales tactics; promote open access to utility data and obtain data to analyze it in combination with existing program successes; explore innovative measures to interest customers; build a strong ad campaign linking energy efficiency to other national goals; be innovative – look internationally for inspiration; develop programs at key points in the life-cycle of the home; understand better who is taking advantage of utility, tax incentive and other programs and why, then replicate it and expand.

4.3.1 Use Caution in Trying to Drive Demand from Outside the Private Sector

A number of interviewees interpreted this third recommendation to “develop programs” to drive demand to mean that the recommendation was centered on developing programs that were either publicly operated or operated by nonprofits with public funding. Although the recommendation may have been meant to capture a broader range of mechanisms to drive demand (including those that would rely upon the private sector for on-the-ground implementation), the more narrow interpretation seemed to be based in part on recent initiatives that had been promoted at the federal level. Several of the interviewees who interpreted the recommendation this way pointed to the low participation rates in recent federally funded home energy retrofit programs to argue that future efforts to drive demand should not continue to rely on this type of framework. While this sentiment was particularly strong among interviewees affiliated with contractor networks, other interviewees expressed similar views.

This general view was stated concisely by a leader of one contractor industry association, who argued, “Using government programs to drive consumer demand is inefficient. This was attempted under the DOE Better Buildings initiative and pretty much crashed and burned.” This interviewee contended that while government programs can play a supporting role in driving demand, they should not take primary responsibility for doing so. Another interviewee, a board member of the same contractor association, charged that the federal government had been too hands-on in trying to driving demand through public programs. Characterizing the efforts of publicly funded programs to recruit homeowners as lackluster, he asked rhetorically, “Why is the government in the business of lead generation?”

This interviewee contended that use of public funds to micromanage the core tasks of private contractors, such as generating and closing leads, was both ineffective and costly and had not led to a scaling up of the home performance industry. As he remarked, “Show me one program where the results have gone up and to the right.” Arguing that no federally funded programs had achieved this basic goal, he declared, “The data from the American Recovery and Reinvestment Act is about to come out, and pretty soon the Wall Street Journal will realize what a colossal squandering of money it was.” He asserted that the primary reason for this lack of success was that government-funded programs had no clear business model that would allow them to scale up through self-sustainable growth. As he remarked, “It’s ok to have startup costs, but there has to be a plausible business model. We lack these models 100 percent.”

Not all of the comments along these lines came from those affiliated with contractor networks. For example, looking at the top three approaches recommended by the Roundtable, one independent consultant remarked, “The third one is miscast. If there’s anything we’ve learned from these programs around the country, it is that no matter how much money you spend on marketing and driving demand, you don’t get that much demand.” He pointed out that California had spent on the order of \$300 million on programs over the last several years and had only managed to retrofit between 5,000 and 6,000 homes. Similarly, a building performance expert stated he was “concerned that this is too programmatic and not focused enough on getting this into the private sector.” He noted that there are “so many homes that could make cost-effective improvements. Government programs will never be able to reach that scale.” Instead, he argued that the key question was, “How can we make these a factor in the private sector?” Even one interviewee who was responsible for implementing residential energy efficiency programs commented that the Roundtable recommendation on driving demand was “very focused on public programs, but there is a lot of work to be done on the market side.”

4.3.2 Advocate for a Stepped-Up Public-Sector Role

A number of interviewees suggested other ways in which the philanthropic community could support the public sector in driving demand to scale up the residential retrofit industry more effectively. In general, these suggestions all involved advocating for the government to take on a higher-level role, leaving the on-the-ground work of the home performance industry to the private sector. These suggestions primarily fell into one of two categories: advocating for the adoption of regulations requiring home energy improvements and advocating reducing the costs of residential retrofits through traditional incentives or other mechanisms.

For example, one consultant argued that the only realistic way of generating sufficient residential retrofits to meet long-term climate goals would be through regulation. He contended that such regulation would need to require not only that residential buildings receive and disclose energy ratings, but also that owners make actual improvements to meet minimum energy efficiency standards. This interviewee suggested that advocating for these types of regulations would likely be more politically feasible in the rental market initially, given that such a movement could be seen as a way of supporting tenant occupants. He pointed to some rental

energy codes that had already been put in place, such as the “SmartRegs” requirements in the city of Boulder, Colorado, which would require all rental properties to meet certain minimum efficiency levels by 2019.

While arguing that regulation would be needed to scale up, this interviewee nonetheless supported increased incentives, as well. As he stated, “Regulation always sets the floor, and incentive programs get you higher. Incentives and regulation go hand in hand.”

Other interviewees also supported advocating for incentive increases or other mechanisms as key strategies for scaling up residential retrofits. Several interviewees argued that increased incentives would constitute an appropriate way for the government to help contractors to close more deals. As one contractor remarked, “I don’t need a program to generate leads. I already have leads. But with incentives, I can tell people, ‘Hey, there’s a great deal here.’” This interviewee also argued that increasing incentives would draw more sophisticated contractors into the industry who would have a better chance of scaling up their operations than the very small shops that currently make up the bulk of the market. As he put it, “The way to drive demand for the innovators is to drive demand among consumers, and the way to do that is to put incentives in the hands of the consumers. More contractors will present themselves if there are opportunities for them to make money.” Another interviewee agreed with this sentiment, declaring, “That is the only way we’ll ultimately scale.” Other industry observers similarly suggested that the appropriate role for the public sector in scaling up residential retrofits is to transform the home performance industry into a more lucrative one. One consultant summed up his suggestion on how the public sector could help the industry in three key words: “Make it profitable.”

It should be noted that there was some division of opinion among interviewees with regard to the need to increase utility incentives. As noted in the section on promoting new models of cost-effectiveness, some interviewees argued that the home performance industry should learn to stand on its own two feet, while others felt that increased incentives would be needed to reach the kind of scale necessary to achieve long-term climate-related goals. There did not appear to be any clear pattern with regard to which groups of stakeholders took one side of this debate or the other. Indeed, as discussed in the next section, there were even differences of opinion on this matter among different contractors. Some of those who argued against advocating for increased incentives implied that there would simply not be political will to increase incentives above current levels, while those who advocated for incentives seemed to suggest that higher incentives would ultimately be a necessary part of mitigating serious climate impacts. From a business standpoint, there were also differences of opinion regarding the sustainability and scalability of the residential retrofit industry without greater incentives. Given the scale of the climate change issue and the low levels of current participation in retrofit programs, our own feeling is that greater incentives will likely be a necessary part of the solution.

Aside from utility incentives, several interviewees proposed other mechanisms in addition to increasing traditional ratepayer incentives by which the public sector could help improve the attractiveness of the home performance industry. For example, one entrepreneur suggested enlisting investments from companies seeking voluntary carbon offsets, as well as advocating for the expansion of regulated carbon credit systems and channeling more of those funds into the home performance market. Another interviewee pointed to the solar industry as an example of a market in which the government's primary role had been to change costs and pricing at a level "higher up the food chain" than in the energy efficiency world, where recent federal funding had gone directly into program creation. He argued that demand for solar had grown rapidly in recent years in part because the public and private sectors had worked out a more symbiotic relationship. In his view, more of this type of public-private cooperation was needed in the residential energy efficiency sector. As he put it, "Some of the better programs are funding contractors and supporting contractor originations, instead of treating contractors like the enemy."

4.3.3 Support Private Contractors

As noted in earlier sections, not all interviewees agreed that increasing incentives would be an effective or sustainable way of scaling up the industry. One contractor doubted that home performance companies would be willing to expand on the basis of incentive programs that could end without notice, while another interviewee expressed skepticism about the feasibility of navigating the political process required to significantly increase ratepayer contributions.

Several of the interviewees who expressed these types of views nonetheless supported the general notion that providing additional support to private-sector contractors was the most important strategy for scaling up the residential retrofit market. They put forward alternative views, however, as to how contractors could best be supported. For example, one contractor suggested that instead of increased incentives, contractors needed more support from successful peers and knowledge-sharing networks. This interviewee argued that contractor networks could educate members on how to grow a home performance business, touching on all key aspects of business development, such as accounting procedures, human resources, marketing and sales, etc. He contended that the primary bottleneck in scaling up the residential retrofit industry was the "pace of entrepreneurship," noting that many contractors are better versed in building science than they are in successful business practices. As another interviewee put it, "The biggest barrier is that most residential contractors don't have the fundamental business skills. Their customer relationship management system is a coffee-stained napkin that they throw away. They forget the customer even called."

In one contractor's view, intra-industry advising would help promising home performance contractors grow their businesses successfully. He suggested that philanthropic funding to support such an advisory network could be an effective use of philanthropic resources. Further, he asserted that if contractors could develop the confidence to scale up their business on their own, then they could use program incentives as an "accelerant" rather than a lifeline. While acknowledging that incentives could help increase the pace of residential retrofits, he

nonetheless declared, “I believe firmly that there is a demand for this without any incentives at all.”

Another contractor specifically emphasized improving contractor sales tactics as a priority for scaling up the industry, particularly given that customer acquisition costs can stand in the way of growth. This interviewee remarked that most home performance contractors in the industry today are “mom-and-pop shops that don’t know how to sell.” She noted that in the solar industry, one company had reported customer acquisition costs of as much as \$2,000 per customer; an amount that she said was not sustainable in the home energy retrofit industry. She noted that her company had reduced customer acquisition costs through targeted community-based outreach, working with community organizations such as faith-based institutions, neighborhood associations, healthy food stores and farmers’ markets to identify those customers most likely to be most interested in retrofitting their homes. She added that close rates at their company had gone up by 600% virtually overnight once they hired an individual who laid out a specific sales process that worked.

One local program that has often been cited as successful focused a portion of its efforts on business development training for contractors. As the leader of that program stated, “We needed to help them be better businessmen. These are typically single-employee-owned operations.” In addition to business and sales trainings, this program supported private contractors in a number of other ways. For example, it provided financing options not only for customers, but also for contractors so that they could purchase necessary equipment. It even established a nonprofit temporary labor pool to assist during busy seasonal periods when they could not keep up with demand but were reluctant to hire full-time help. The program did all of the bookkeeping on behalf of participating contractors and even paid unemployment insurance.

Experiences like these would suggest that supporting contractor sales and business development trainings could be one strategy for the philanthropic community to support. Yet among other interviewees who supported growing the industry from the outside by increasing incentives and making the value proposition more attractive, there was a degree of skepticism about the value of attempting to grow the industry internally through contractor trainings. One such contractor recounted that he had been to many trainings over the course of his career, noting that there are already trainings available for topics like sales and financial management. In his experience, however, few other contractors actually took advantage of these opportunities. Furthermore, he felt that among those who did attend, few actually incorporated the education into their business practices. As a result, he remarked, “Training is necessary, but if I had money to spend growing the industry, it would be the smallest part of my budget.” He felt that higher incentives would have a much larger impact. He pointed to the solar industry as an example, noting that at one point in California, incentives were as high as \$4 per Watt for solar installations. As a result, the industry saw many new entrants. He noted that there was little or no training for these new companies, yet they tended to be sophisticated and entrepreneurial enough to figure out the business aspects on their own. This contractor advocated putting more money into the hands of the consumer, which would drive demand and

bring more entrants into the residential retrofit industry. In his words, “Without consumer demand, training is a waste of resources. Why train all these people if there’s really no market? A number of contractors have gotten training, and then there’s been nowhere for them to go. Believe me, if they said today, ‘We’re doubling the incentives for air sealing and insulation,’ that would have a bigger impact.”

Similarly, another contractor remarked, “You can give the best training in the world, but if people don’t show, it doesn’t matter how good the training is.” This interviewee felt that most of the existing contractor base tended not to attend trainings, while those contractors who were new entrants to the market were more motivated to do so. In light of these circumstances, he said, “The idea that we’re going to convert all these guys who run one or two-person businesses to leading the charge just isn’t realistic.” As a result, he also supported the notion that increased incentives would help bring more sophisticated contractors into the industry and they would be more likely to then scale their businesses up.

Those contractors who suggested advocating for increased incentives also recognized, however, that budgets might remain limited in the short term. In light of this reality, one such contractor proposed that given limited incentive budgets, homeowners who were early adopters of home energy improvements should be given larger incentives in order to kick-start the market. He suggested that these early adopters could be encouraged to spread market adoption through positive word-of-mouth advertising. Another contractor supported this viewpoint, noting that referrals constituted a key strategy in generating additional business for his own company.

One observer who had worked with several of the contractors interviewed tried to resolve their differences of opinion regarding the need for increased incentives versus other types of support by suggesting that different types of contractor support might be appropriate in the short term versus the long term. He argued that business training should come first in order to demonstrate that home performance contracting can be profitable. At the same time, he felt that incentives ultimately would be needed in order to grow the market to sufficient scale to reach climate goals. Still, he suggested that incentives at the necessary level would not be forthcoming until contractors could first demonstrate that they had the business acumen to run their operations effectively. By doing so, contractors could prove to policymakers that such incentives would not be wasted. This interviewee felt that business could indeed be profitable even at today’s incentive levels but that far too few contractors understood how to run their existing businesses sustainably. In his words, “The fundamental opportunity is there; it is largely a matter of helping the market see it. By training contractors to be successful, we can demonstrate profitability, and then additional market investments will take the market to scale.”

Beyond incentives and training, interviewees suggested a few other ideas for scaling up demand by supporting the growth of the home performance contractor industry. For example, one contractor proposed that programs should reward contractors who have a proven track record of success and encourage them to scale up further. Another contractor suggested that

programs should provide direct support for contractors to build capacity to keep up with increases in demand. In his words, “They have millions out there for incentives. Do they have one dollar available to help contractors buy their own equipment?”

4.3.4 Support Innovative Software and Other Tools

An additional way of supporting the home performance contractor industry that emerged from the interviews was to support the development of innovative tools such as software platforms that incorporated a combination of elements that could help contractors go from home energy audits to closing home performance jobs. For example, one interviewee suggested that that it was possible to increase customer demand by providing contractors with an energy modeling tool that is fast, accurate, and flexible. He pointed to the software offered by Cake Systems (with which he was affiliated) as a model that he felt fit this description. This interviewee noted that the software generated both an asset rating and retrofit recommendations, all with documentation that could act as a bid document for contractors, allow homeowners to apply for financing and rebates, and even link up with the Multiple Listing Service (MLS) systems. The software platform could also be used to rate contractors using a system similar to Angie’s List in order to increase consumer confidence in the contractors they chose. As a result of all of these features, the interviewee indicated that the audit-to-retrofit conversion rate in programs using this software ranged from 45-60%.

4.3.5 Work to Capture Efficiency in Home Values

Beyond direct support for the contractor industry, several interviewees also cited efforts to incorporate energy efficiency into home values as another key strategy in driving demand among consumers. For example, one interviewee suggested that the philanthropic community should lend its support to the federal SAVE Act, which is designed to improve the accuracy of mortgage underwriting used by federal mortgage agencies by ensuring that energy costs are included in the underwriting process. As he put it, “The question is how do you change the mortgage process so that home affordability is based on principal, interest, taxes and insurance, plus energy, or PITI +E.”

A number of other interviewees suggested focusing on helping to capture the value of energy efficiency upgrades in home resale transactions. For example, one energy efficiency advocate argued that broad-based marketing campaigns to promote residential retrofits would not have much effect if the homeowners could not be sure that they would get the value of their investments back when they sold their homes. As he put it, “What is it that people typically put their money into? Improvements that increase the resale value of their homes.”

Another interviewee suggested that one important element in capturing the value of home energy upgrades lay in educating appraisers, perhaps by working with the Appraisal Institute. She noted that the growth in kitchen and bathroom remodeling projects was largely the result of a perception that such investments would increase a home’s selling price. As she remarked, “I’ve seen a whole industry develop in the last 20 years of updating kitchens and bathrooms because of this widely held belief that it will be captured in the resale value.” She suggested

that the home performance industry needed to work closely with appraisers to help extend this perception to home energy upgrades by demonstrating all of the benefits of such investments, including both energy and non-energy benefits.

Several other interviewees also suggested linking residential retrofits to the growth of kitchen upgrades and other remodeling projects. As one implementation contractor remarked, “People will take out a loan for \$50,000 or even \$100,000 to complete a home remodeling project. We should take advantage of that. Why don’t you add on an energy and comfort guarantee on top of that?” Similarly, a building performance expert noted that Americans spend billions of dollars each year improving their homes in ways other than making energy efficiency improvements, arguing that the only way to scale up the home performance industry would be to make residential retrofits just as common. As he put it, “Somehow energy efficiency is not captured in the thought process of consumers. People expect governments and utilities to pay for these services. We have to break that cycle and position this such that it becomes as rational as doing a kitchen upgrade.”

One mechanism suggested by several interviewees to help capture the value of energy efficiency in home resale transactions was to add some kind of energy efficiency rating to the real estate industry’s MLS systems along with increasing collaboration with that industry. For example, one implementation contractor argued that there was “definitely a need for more documentation of energy efficiency in MLS.” He suggested that real estate agents could be encouraged to market energy efficiency as an added feature of a home if upgrades had been made prior to the resale transaction. He added that real estate agents might be more likely to do so if they could be given appropriate documentation that they could use to market the energy efficiency features of the home, and he recommended that such partnerships with real estate agents could be enhanced if contractors were willing to offer an ongoing maintenance agreement to homebuyers.

While there was some support among interviewees for adding an energy rating to MLS systems, a number of interviewees also pointed out challenges with this approach. For example, one program implementer noted that even in states in which there are already fields in MLS that allow for entry of energy efficiency data, there is often still a need for more contractors who are qualified to gather the relevant information on a home. She also felt that there was still a need to settle on an accepted, inexpensive, and convenient home energy efficiency rating system that will allow MLS entries to be standardized.

Another program implementer suggested that projects to integrate energy efficiency into MLS systems could perhaps expand across the country but also noted that the problem with home energy ratings is that there are so many different types that no single rating has become accepted within the industry. She pointed out that in some states there were whole task forces devoted to getting the right fields and ratings into the local MLS system. In some locations, she suggested it might be worth simply getting a field into the MLS service even before it was clear

what type of rating would be used as an input, although this issue would need to be worked out eventually.

Given all of these challenges with consistent energy labeling, one building performance expert involved in contractor accreditation for home performance jobs argued that the first step should be to ensure that home performance jobs are completed by qualified contractors adhering to industry standards so that energy efficiency features of different homes can be compared more easily. Otherwise, this observer argued that MLS entries regarding the energy efficiency level of a home would lack sufficient consistency. The interviewee also argued that increasing the demand for home performance would be more likely to encourage real estate agents to market energy efficiency than simply adding energy efficiency as a feature of MLS systems.

Other observers fundamentally questioned whether the use of home energy ratings would in fact drive demand. As one consultant put it, “Everything I’ve seen is inconclusive with regard to the notion that benchmarking or ratings drive demand.” He argued that the downside of ratings, as observed from experience in the field, is that “people think that rating the home is enough. They think they don’t have to do more.” Moreover, he argued that there is currently no defensible rating that can allow the appraisal industry to assign a different value to a home based on its rating. He noted that this was especially true in the wake of the housing market collapse, in which the appraisal industry came under fire. He asserted, “If appraisers can’t point to the research and point to comps, then the value is zero. Saying that the home is more energy efficiency is great, but the increased value may not really be there.” He suggested that rather than trying to use ratings as a proxy for increased home values, the industry should focus directly on figuring out how energy efficiency can impact the value of a home. He argued that doing so would require a study with many data points in different geographies. As he said, “Someone needs to be supporting the study, because the market’s not doing it on their own right now. Money alone won’t do it. We need to have access to data and a large enough sample size.” This could be another useful role for philanthropy.

Another observer went as far as to say “labels don’t work” because the costs of gathering and inputting information are too high, especially without more evidence that they spur people to action.

4.3.6 Promote Innovative Financing

Several of the interviewees also pointed to innovative financing as one tool that could help to drive demand. In some cases, interviewees felt that financing could be integrated with other key strategies to drive demand that have been mentioned. For example, one entrepreneur suggested that certain forms of financing could be helpful in capturing the value of energy efficiency in the home. In particular, he felt that Property Assessed Clean Energy (PACE) financing, if ultimately successful, could result in reassessments of homes for property tax purposes. He argued that if energy efficiency were incorporated into property tax assessments, this would change the way in which energy efficiency and home values were viewed on a fundamental level.

In a different area, one consultant commented that the solar industry demonstrated how financing could be used as a tool to drive demand. He noted that many solar installations today are financed with no money down, using investment capital to support installation costs. He added that solar financing often involved third-party, guaranteed-savings arrangements in which homeowners were not responsible for maintaining the installations. This interviewee suggested that ongoing efforts should be supported to explore similar arrangements with regard to energy efficiency, as financing arrangements sharing certain features with those of the solar industry might help bring residential energy efficiency to scale. As he put it, “If you go to someone and say, ‘Here’s the deal. We’ll give you a home retrofit and we’re going to make sure it keeps working by giving you an annual service contract, and it’s not going to cost you anything, and you’ll also get a guaranteed marginal savings on your utility bill that’s never going to go up,’ that’s a much better deal than saying, ‘I’m proposing to do a home retrofit on your home, and it’s going to cost \$22,000. Where’s the money?’” He recounted that in the last few years, about two thirds of solar installations have been funded using financing arrangements like this. He suggested that a number of key factors would be needed in order to apply this type of financing arrangement to energy efficiency, such as improving the reliability of projected energy savings. However, another consultant noted that the risks of energy savings not materializing on any given home could potentially be mitigated by the large number of buildings in the residential sector, which could make it easier to pool risk.

One of the contractors interviewed also supported the idea that financing could be used to drive demand. He argued that contractors need a “no-brainer” way to sell jobs by offering cash-flow positive financing arrangements. He noted that his company sells jobs that range from \$5,000 to \$35,000 and that it can be very difficult to sell the work if he simply puts that number in front of potential customers. By contrast, if he can tell customers that they will be saving more every month than they are paying in financing costs, then it becomes a “no-brainer” investment for them. He argued that rebate levels should be offered on an individualized basis in order to make such positive-cash-flow financing possible. As he put it, “If that value proposition isn’t going to work on its own, the rebate level needs to be there to make it work.” He acknowledged that this would lead to different rebate levels for different customers, including larger rebates for customers using natural gas. However, he argued, “That’s the reality of the situation. If the goal is reducing energy use, that’s what you have to do.”

4.3.7 Consider Supporting a National Ad Campaign

In addition to all of these targeted efforts to drive demand and scale up the home performance industry, one program implementer argued that a strong national ad campaign would also be helpful. She asserted that there was a need for some “national cheerleading” around energy efficiency. She added that individual states and programs cannot create a national campaign on their own and that many programs are very limited in the amounts that they can spend on marketing. Therefore, she suggested that it would be helpful if there were a national marketing campaign that these programs could tap into.

4.3.8 Consultants' Take

We agree with those interviewees who felt that driving demand is a key priority in scaling up residential retrofits. However, we also agree with others who felt that “developing programs” is not the only—or even necessarily most effective—way to drive demand. We believe that several of the interviewees’ responses with regard to the effectiveness of publicly funded programs were colored by the recent experience of the Better Buildings Neighborhood Program, which struggled to produce the quantity or depth of retrofits that one might hope would be commensurate with the amount of money that was spent under that program. We feel that it would be worth looking at a broader cross-section of programs, including ratepayer funded programs, to examine whether other programs funded through public or ratepayer dollars have had any greater success. In addition, we do believe that some valuable “lessons learned” will emerge out of some of the more promising programs funded by the Better Buildings initiative. Nonetheless, we think it is fair to advise caution when it comes to putting “all the eggs in one basket” by trying to drive demand only (or perhaps even primarily) through publicly funded programs.

At the same time, we do not believe that anyone has yet demonstrated a surefire way to reach scale in the residential retrofit industry. It is much easier to criticize existing approaches that have been met with challenges and propose theoretical alternatives than it is to make those alternatives actually work in practice. Our view is that there is not as yet—and there may never be—a single “silver bullet” answer to achieving scale in the residential retrofit industry. As such, it is worth continuing to explore a range of options.

Nonetheless, we do support some rethinking of the most effective roles for both the public and private sectors. While we are by no means against continuing to explore the role of publicly funded programs, we do believe it makes sense to ask whether the public sector could ultimately be more effective by taking on a higher-level role. This might include incentivizing or requiring advancements in energy efficiency through legislation and regulation, as well as increasing incentives and exploring other ways to make the home performance industry more profitable and attractive to entrepreneurs.

We agree that private-sector contractors are key to driving demand, but we also feel that many contractors today are better at the technical side of the business than they are at the business side. Factors such as successful business models, cost-effective lead generation, customer relationship management, sales and marketing, and back-end operations are all critical to achieving scale, and our experience is that many contractors today do not have the necessary level of sophistication in these areas to grow their operations significantly. We also recognize that running a home performance business profitably is a challenge, given the relatively low revenues per job as compared to the investment required to generate and close a lead. It is important to support those existing contractors who have figured out ways to be successful despite these challenges and to encourage new entrants into the industry who are willing to explore innovative ways of “cracking the nut.” We agree that some type of knowledge-sharing network among successful contractors in addition to business management systems and tools

could help them to improve their business practices and grow their operations. But we acknowledge that broad-based classroom-style trainings may not be the most effective way of transforming the current industry. In addition, we agree that increasing margins through public-sector support would perhaps draw in more of innovative entrepreneurs from the outside. While this may be challenging to justify from public policy perspective, we know that the retrofit industry will not make the investment to scale up unless it becomes a truly profitable business proposition.

We also believe that capturing the value of energy efficiency in home resale transactions is important. We agree with those interviewees who supported adding some type of home energy label to MLS systems, though we acknowledge that this raises the question of which rating system to use. Given that few jurisdictions thus far have implemented residential labeling and disclosure policies, we disagree with those interviewees who have already concluded that such policies are ineffective. However, we acknowledge that implementing effective labeling and disclosure policies will involve a range of challenges, from deciding what type of rating to use, to integrating the rating into mortgage underwriting and home sale transactions to justifying public policies that mandate energy disclosure at the time of sale. We also recognize the risk that some residents who get a rating may be prone to “single-action bias,” making them less likely to go on to pursue additional energy improvements. Given all of these challenges, we believe that philanthropy could play a useful role in supporting pilot initiatives to implement labeling and disclosure policies in the residential sector.

We believe that the jury is still out with regard to the centrality of financing in driving demand. On the one hand, we believe that financing is often oversold the key that can unlock huge potential for scaling up residential retrofits. In part this is because upfront costs and lack of access to capital are too often cited as the primary barriers to energy efficiency improvements. We would point out that significant portions of the population who could afford energy efficiency upgrades out of pocket or who could easily qualify for home equity loans and other types of financing today nonetheless are not pursuing energy efficiency projects for a whole host of other reasons. On the other hand, we do believe it is possible that certain innovative business models in which financing plays a key role may ultimately help to drive demand. We recognize third-party power purchase agreements have been a significant factor in increasing the demand for solar installations and that a few innovators are exploring how similar concepts might be supported in the energy efficiency space. We have seen residential business models that are based on concepts such as guaranteeing energy savings, monitoring home energy use, and taking a percentage of the savings, similar to commercial-sector ESCO models. We believe it would be worthwhile to continue exploring whether such models could be successfully applied to residential energy efficiency improvements and that this could be an area where philanthropy could play a useful role. We also support exploring the concept of sizing interest-rate buy-downs to make all customers cash-flow positive, provided that they agree to bring their homes up to some minimum energy efficiency standard. Such buy-downs would likely need to be

implemented by a ratepayer-backed program administrator, but philanthropy could play a supporting role in scoping out how such an initiative would work in practice.

Finally, with regard to supporting a national ad campaign, we agree that the urgency of mitigating climate change, as well as the linkage to home energy retrofits, is not sufficiently “top of mind” at a national scale. We believe that philanthropy could play a useful role in connecting the dots between climate change as a real problem and home energy retrofits as an important solution. We are also supportive of promoting all of the other benefits of residential energy efficiency on a broader scale. However, we would caution that some of the examples we have seen of broad-based public interest advertising around residential energy efficiency, such as those supported by the Ad Council, appear to be somewhat vague and may be unlikely to motivate widespread action. We would suggest exploring ways that such campaigns could be improved, as well as exploring other avenues to make energy efficiency a national priority, such as advocacy at the federal level.

5 RESEARCH NEEDS

This section summarizes the interviewees' responses to the top three residential retrofit research needs identified by the expert Roundtable, which are to develop a methodology for full substantiation of non-energy benefits (in support of the utility cost-effectiveness tests), prepare case studies of best and worst practices for program delivery, and research consumer decision-making processes.

5.1 Full Substantiation of Non-Energy Benefits

This section summarizes the interviewees' responses to the residential Roundtable's first recommended research priority:

Full Substantiation of Non-Energy Benefits: Document the impact of energy efficiency retrofits on jobs economic development; home value; health. Understanding this is needed to enhance utility programs; access economic development funds. Perhaps develop a methodology using standard development process like ANSI for credibility. This information should then be included in the utility cost-effectiveness tests, such as the Total Resource Cost (TRC) Test.

5.1.1 Many Experts Agree that Quantifying NEBs is Important

Many interviewees supported the notion of pursuing the substantiation of non-energy benefits as a research priority. As one building performance expert stated, "Quantifying NEBs is critical. They are real. The fact that they aren't incorporated into the TRC is ridiculous. It's to the point where health and safety testing can be screened out because it's not part of a measure and may fall off the list of what's considered acceptable."

Similarly, a program implementer asserted, "There is a lot more to energy efficiency than just the energy component." This interviewee suggested looking at both homeowner NEBs, such as air quality and comfort, as well as societal NEBs, such as jobs created. Another interviewee noted that it was important to remember that there are actually three categories of NEBs, including those that accrue to the homeowner, those that accrue to utilities, and those that accrue to society as a whole. In addition, there can be non-energy costs associated with measures and programs, such as reduced convenience in certain cases, and he argued that these should be considered, as well.

In order to advocate successfully for the inclusion of NEBs in cost-effectiveness screening tests, one program implementation contractor argued that more concrete examples of NEBs at all levels are needed. He used the example of energy efficiency training programs, which may not produce savings directly, but do create jobs along with trained individuals who eventually will produce energy savings once they are hired. He pointed to a recent training program that had resulted in an 80 percent hiring rate, arguing that experiences like that could be used to support the notion that the home performance industry creates jobs, which should be factored into the benefits of residential energy efficiency improvements.

5.1.2 Substantiation of NEBs Will Also Help Market Home Energy Improvements

Beyond their impact on cost-effectiveness screening, several interviewees pointed that NEBs, if fully substantiated, could contribute even more significantly to the marketing of home performance jobs both directly by contractors and indirectly through the real estate industry. As one consultant remarked, “I think this may be as important for creating future marketing to consumers as it is for the regulatory process.” Another consultant suggested that quantifying NEBs could contribute to changing the way appraisers value home energy improvements, but only if the data were thoroughly researched and reliable. As she put it, “You have to have some hard data before you can ask an appraiser to change their business. That would require a pretty powerful study.”

5.1.3 Significance Depends on State Circumstances

One interviewee noted that whether quantifying NEBs is important depends on the regulatory situation of a given state. In particular, this observer argued that NEBs will not matter in a state that does not have decoupling and other key policies in place. Without decoupling, utilities lose money every time they spend money on energy efficiency. As a result, even if quantifying NEBs boosts the cost-effectiveness ratios of measures and programs significantly, utilities in such states may still be dug in against them.

5.1.4 Challenges of Quantifying NEBs May Not Always Be Worthwhile

Some interviewees asserted that wrestling with the challenges inherent in valuing NEBs may not be worth the effort required. As one contractor noted, “People have been trying to do this for decades.” Another interviewee argued, “This is a consultant’s fantasy. We’re going to have economists valuing NEBs for the next 40 years.” He noted one recent example in which a regulator had in principle accepted the notion of valuing environmental externalities and had asked stakeholders to form a committee to determine the right value to use. As a result, he said, “We fought with each other about whether it was \$19.23 or \$23.19.” In the end, he said that energy efficiency advocates had “traded away” NEBs. In that particular case, advocates knew that if they did not have enough budget to do all cost-effective measures, and budgets were not likely to expand, then expanding the number of measures and programs that passed screening by including NEBs would not have made a great impact. According to this interviewee, “We already had oodles of TRC cost-effective conservation that wasn’t happening,” so even if advocates had been successful in getting NEBs included in cost-effectiveness tests, “it would have been a pyrrhic victory.”

Another observer felt that full substantiation of NEBs was worthwhile in principle but remarked, “What needs to be recognized is how huge a challenge this actually is.” He pointed to the wide range of benefits to the homeowner and to society, noting how difficult it can be to isolate each one and quantify it. For example, with regard to health benefits, he observed that all kinds of things can impact health, so it may be difficult to isolate the positive impacts of energy efficiency upgrades. He added that some analysts had tried to quantify NEBs using econometric models, but he remarked that the problem with this type of work is that it “never comes up with really definitive results, and you get lost in the numbers.” He argued that the focus should be

on “what is easiest to justify and to measure in a way in a way that you limit the dissension among a regulatory body.” While he acknowledged that this work could be important, he also felt that “it’s a huge research pit.”

5.1.5 At a Minimum, Quantify Benefits that Are Readily Calculable

Several observers distinguished between benefits that are readily quantifiable but not always included in cost-effectiveness screening tests and those that are may be harder to pin down. For example, one observer argued that water savings are relatively easy to quantify and should be measured and included in cost-effectiveness equations in the near term. Another interviewee argued that all fuel savings should be quantified and included as avoided-cost benefits from a total resource perspective, even if energy efficiency programs are administered by a utility that sells only one type of fuel. These interviewees felt that advocating for the addition of such quantifiable avoided-cost benefits might be easier in the short run than trying to quantify and incorporate non-energy benefits into cost effectiveness screening.

5.1.6 NEBs are Not the Only Important Aspect of Cost-Effectiveness Screening

Some interviewees pointed out that despite recent attention on quantifying NEBs, other aspects of cost-effectiveness equations can have a significant impact on screening and should not be ignored. For example, one energy efficiency advocate noted that the choice of what discount rate should be used to value benefits in future years can have a significant impact on the total benefits of a given measure or program. In many cases, states use the relatively high discount rate associated with utility costs of capital, rather than a relatively lower societal discount rate, to value future benefits. This can lead to a significant reduction in the value of benefits accruing in future years.

5.1.7 Consider Alternative Approaches

One interviewee offered an alternative to quantifying all of the individual NEBs associated with each measure or program, focusing instead on allocating measure and program costs in proportion to consumer motivation. He noted that his firm had conducted a study a few years ago of about 50 people who completed home energy retrofits and asked them why they went forward with the project. They found that only about 20% of consumer motivation could be attributed to a desire to reduce energy bills, while 80% was attributable to a wide range of NEBs. This interviewee suggested that rather than add NEBs to the benefits side of the equation, costs could be reduced on the other side of the equation in proportion to the percentage that represented non-energy consumer motivation. In other words, if the screening test is only going to look at energy costs and benefits, then the proportion of consumer motivation attributable to energy savings could be used as a proxy for the “marginal cost” of measures and programs related to energy savings. However, this interviewee acknowledged that the industry would need to document “in several different studies, in different places” the proportion of consumer motivation that could be attributed to energy and non-energy benefits. He suspected that such studies would continue to find “that customers overwhelmingly value NEBs more than energy savings.” In his view, “If you could document that through survey

research, that would be a powerful argument for using motivation to reduce costs” in cost-effectiveness screening tests.

5.1.8 Consultants’ Take

In principle, we agree that non-energy benefits (NEBs) should be incorporated into cost-effectiveness screens that include the perspective of an entire jurisdiction or society as a whole. These types of tests are generally all-inclusive of costs, and thus should be all-inclusive of benefits, as well. We believe that philanthropy could support a project to take a closer look at how non-energy benefits have been quantified in Massachusetts, as well as approaches being explored in other states, and to explore whether such approaches or others could be applicable in other jurisdictions.

At the same time, we understand that there are significant technical challenges involved in assigning hard numbers to non-energy benefits that parties can agree upon, and that the time and expense involved to do so would be significant even if there were an accepted methodological approach. At a minimum, we believe that quantifying and incorporating avoided costs and other benefits that are relatively easy to measure, such as water savings and savings of all fuels, should be an immediate priority in jurisdictions that do not currently do so. Given the potential challenges of quantifying other types of NEBs, we would also suggest exploring alternative approaches, such as shifting toward greater use of the program administrator cost test or, as one interviewee suggested, subtracting out measure and program costs (rather than adding benefits) in proportion to the overall average percentage of consumer motivation that can be attributed to non-energy related factors. Philanthropy could continue to support efforts to identify and present best-practices in these areas to help programs address the barriers imposed with full benefits are not quantified.

We also agree that other issues, such as deciding upon whether to use a societal or utility-related discount rate, can also have a significant impact on cost-effectiveness screening and should not be ignored. To the extent that cost-effectiveness screening plays a role in determining shareholder incentives, we would support exploring the approach mentioned by one interviewee of basing such incentives on actual projected fuel savings for all future years, since this approach would avoid the disadvantage of discounting future savings. Ultimately, we also believe that it may be appropriate to move away from cost-effectiveness screening and assess programs instead primarily on the basis of how effective they are likely to be as climate change mitigation strategies. Again, philanthropy could help explore this challenge and assist in the development of a new, higher-level approach to screening program cost-effectiveness.

5.2 Case Studies

This section summarizes the interviewees’ responses to the residential Roundtable’s second recommended research priority:

Best and Worst Practices for Program Delivery: Document through case studies, as well as document the impacts of energy efficiency retrofits on homeowners.

5.2.1 Some Work Has Been Done or Is Ongoing

Several interviewees pointed out that a number of organizations have already collected best and worst practices with regard to home performance programs or are in the process of doing so. For example, one energy efficiency advocate noted that organizations like the U.S. Department of Energy (DOE) and the American Council for an Energy-Efficiency Economy have been doing this type of work. However, this interviewee suggested that additional research on best and worst practices might be useful for particular states that were struggling to establish successful programs. Similarly, one program implementer remarked, “DOE is working on best and worst practices for program delivery. It’s very important, but I feel like others are covering it.” Another interviewee agreed, saying, “Best and worst practices for program delivery is always an important thing to share, but we did that with the Better Buildings program, and there will be information coming out of DOE.” This interviewee suggested that at this point it would be more useful to “pick a few winners and fund them.”

However, not all participants felt that adequate work had been done to collect best and worst practices. For example, one interviewee felt that while DOE had collected best and worst practices on programs funded by the Better Buildings initiative, more information was needed on activity outside of that initiative. As she put it, “Just looking at Better Buildings is not an accurate slice of what’s going on in the residential retrofit market.”

Another interviewee suggested a different twist on case studies by focusing on the potential for replicability. By promoting successful efforts and highlighting the elements of that program that enabled it to succeed, other programs or locations with similar characteristics could replicate those elements that led to success. She suggested “Look at the Clinton Foundation’s Home Energy Affordability Loan being offered by businesses to their employees for retrofit work at their homes. We should promote the elements of that model to other businesses with similar characteristics.”

5.2.2 Establish a Database or Clearinghouse

While a number of interviewees felt that much of the important work in gathering best practices had been done or was ongoing, several respondents felt that the information had not been adequately aggregated and sorted into a single accessible resource that was easy to use. A number of interviewees suggested that this could be a project that the philanthropic community could help to support. As one building performance expert put it, philanthropies “could help set up a clearinghouse on what works and what doesn’t.” Similarly, a program implementer who felt that other organizations were covering best and worst practices stated, “There could be a project in terms of collecting the research that’s already been done.”

Another interviewee suggested that it could be very useful to have a regularly updated database that would list home performance jobs completed per jurisdiction, market share achieved, average savings per home, and other similar metrics. He noted that at the present time it is difficult to pull that kind of data together in order to do an apples-to-apples comparison across

programs and decide which ones are doing well. As he put it, “A regularly updated database would be more useful than a new study on best practices. We’ve had a zillion of those.”

5.2.3 Use Objective, Quantifiable Metrics for Program Comparison

Other interviewees expressed the view that even though some work had been done to collect best practices, the results were not sufficiently objective, quantifiable, or fit for easy comparison. As one consultant put it, “What’s been done is not as objective as it needs to be.” Another consultant noted that despite the fact that other organizations are collecting case studies, “No one is actually getting to the reality of the situation. No one is documenting what the program cost divided by the number of kilowatt hours saved. They may be spending \$25,000 per home to get meager results.” In his view, the industry needed a much more rigorous best and worst case analysis to be done, which would require digging into the details of costs and savings. He argued that programs may be reluctant to provide such detailed information. As he put it, “Someone will need to FOIA the various programs.” As another interviewee put it, “We’ve spent ridiculous amount of money on energy efficiency, so it would be nice to know how much energy efficiency we’re getting per dollar.”

In order to make the information more objective, one building performance expert recommended that there be a “Consumer Reports” type of rating system, using circles with dots, shading, and colors to represent scores on different program metrics. The programs judged most successful would get the most circles with dots, which would create an objective scale for comparing programs.

5.2.4 Consider Focusing on “Worst Practices”

One interviewee noted that while other organizations had collected information on best practices, he had rarely, if ever, seen a “worst practices” case study. As he put it, “Few programs are willing to get up and say, ‘We ran a terrible program.’ We need to find a way to present that in a non-threatening way.”

5.2.5 Focus on Best and Worst Practices among Contractors, Not Just Programs

One interviewee suggested that in addition to gathering best and worst practices from programs, it would be useful to focus on best and worst practices among contractors. He argued that it would be helpful to know how profitable different contractors are and to get a better understanding of their customer acquisition costs and barriers to growth. He suggested sharing this information widely so contractors can understand better what it takes to grow. As he put it, “Growth is the end goal, but we need to get to a point where overheads are covered and contractors can make profits.” As an added piece of this research, he suggested supporting the contractor industry associations in collecting aggregate financial data to get a better handle on costs and revenues across the industry. He noted that many industry trade associations have this kind of data but that existing home performance contractor associations do not have it, though it is something they would like to gather.

5.2.6 Consultants' Take

We agree that some important work has been done or is ongoing with regard to gathering case studies that highlight best and worst practices among residential energy efficiency programs. However, we also agree with those interviewees who stated that such work has not always been presented in an objective manner using quantitative metrics that allow for comparisons across programs. We recognize that there may be significant challenges involved in comparing across programs with different structures, but we nonetheless feel that it would be worthwhile to explore a more objective and comparative approach. We would suggest that such a project could be a useful one for philanthropy to support. In addition, we also agree that it would be useful to have a regularly updated database that makes information on programs, as well as cross-program comparisons, available to the industry. Providing support to keep this database current would be important, since the industry is constantly evolving.

We also feel that collecting “worst practices” (or lessons learned regarding how to avoid major pitfalls) could be a useful role for philanthropy, given that it would likely take an objective third party to support this type of work. While all evaluations should be objective, those that may point out negative aspects of a program are especially difficult to produce in an impartial manner by those organizations that may have supported the program’s existence.

Finally, we support the concept of collecting best and worst practices among contractors, as well as programs. The notion that contractors matter at least as much as programs, if not more, was a constant theme we heard among many interviewees. We agree that understanding what different contractors are--and are not--doing well is critical to improving the industry. In this same vein, it would also be useful to support the collection of industry-wide metrics to get a better understanding of how the home performance industry is progressing as a whole.

5.3 Research the Consumer Decision-Making Process

This section summarizes interviewees’ responses to the residential Roundtable’s third recommended research priority:

Research Consumer Decision-Making Process: Obtain a better understanding of what drives consumer behavior to do energy efficiency retrofits and how to then integrate these factors into seamless program of marketing delivery with financing options. Speak with utilities, market research firms, others.

5.3.1 Many Interviewees Agreed that More Research Would Be Useful

A number of interviewees agreed that more research was needed to understand the consumer decision-making process at a deeper level. As one consultant put it, “Figuring out what drives consumer demand is critical. When it comes to energy-related measures in homes, consumers don’t tend to follow the same logic as they would with other things. For example, I have been consistently amazed by the level of dysfunction that people are willing to put up with in their homes that they would not put up with in their cars.” He suggested that the industry needs to figure out what drives people when it comes to their homes, whether that means focusing on

non-energy benefits like aesthetics or using different language and terminology to which people will be more responsive.

A building performance expert agreed that researching the consumer decision-making process is key. He remarked, “We need to know how you take a lead and turn it into a home performance job.” He suggested looking at strategies such as presenting “good/better/best” scenarios to customers, in which a contractor offers to fix one problem that a customer may be complaining about with a patch but also explains the benefits of more comprehensive solutions. He noted that while the conventional wisdom was that such strategies were effective, there was currently no definitive research confirming this.

Another building performance expert suggested that it would be useful to understand why consumers see other types of home improvements as more attractive than energy efficiency upgrades. Similarly, one program implementer suggested focusing on the question of how to leverage other investments that people make in their homes to convince them to invest in energy efficiency, as well. She noted that some people were making energy efficiency investments but that these investments often were not as comprehensive or cost-effective as they ought to be. She suggested focusing additional research on how to improve the types of investments that people make at key points along the way as people made upgrades to their homes.

5.3.2 Some Work Has Already Been Done

Several interviewees noted that some significant work had been done to understand consumer decision-making better with respect to energy efficiency. For example, several interviewees pointed to the work of Suzanne Shelton on consumer attitudes as one source of useful information in this area. Other interviewees mentioned the work of Kat Donnelly at MIT, as well as Kerry O’Neill of the Neighbor-to-Neighbor Energy Program in Connecticut, as additional resources who had gathered useful data on the consumer decision-making process. Other interviewees pointed to the work of the Lawrence Berkeley National Lab, including the report on “Driving Demand for Home Energy Improvements,” as a key source of information on consumer decision-making.

Given that work that has been conducted in this area, some interviewees suggested that more research would not necessarily lead to significant advancements. As one consultant put it, “Maybe we know enough. It’s always going to be harder to sell energy efficiency than a granite countertop.” Another consultant remarked, “What are we going to learn from that that we don’t know already? This has been done.”

One other consultant echoed this sentiment, saying, “We’ve done a lot of consumer research already, and it did not help. It did not have anything like the impact that we’d hoped for.” He noted that over \$100 million had probably been spent in California on marketing based on consumer research and that the number of homes retrofitted was only a few thousand. However, this interviewee argued that additional research on the consumer decision-making

process could still be useful for purposes of understanding what proportion of measure costs could be attributed to their energy benefits, which could reduce the cost side of TRC screening equations and expand energy efficiency portfolios.

One of the interviewees engaged in consumer behavior research noted that they will be making their high-level research findings publicly available on their website later in 2013. However, they will continue to conduct custom surveys for clients in specific markets, which she feels is necessary to tailor marketing messaging and approaches. So, while we may know general consumer behavior attitudes, there will still be subtle differences across market segments and geographies.

5.3.3 Additional Research Needed on Other Aspects of Driving Demand

Several interviewees felt that while driving demand should be a key research priority, the research agenda should be broadened to include more than just the consumer decision-making process. For example, one energy efficiency advocate argued that more research was needed to demonstrate how to incorporate energy efficiency into the asset value of the house, which he argued would do more to drive demand than additional research on consumer marketing and sales tactics. He suggested conducting a few pilot projects and documenting how the asset value could be captured in home values so that this research could be used by others to experiment with such an initiative in other locations.

Another interviewee suggested that rather than trying to drive demand by understanding consumer decision-making, it would be more useful to understand whether there was a statistically significant difference in mortgage default rates that could be attributed to the energy efficiency of a home. He noted that other researchers had found impacts like this based on location efficiency, (i.e., looking at transportation costs relative to where a home was located). This interviewee argued, "If consumers could obtain lower mortgage rates because of higher energy efficiency ratings, that would change the whole market."

5.3.4 Consultants' Take

We agree that more research to better understand the consumer decision-making process would be useful. We acknowledge that some work has been done and that more information may become available in the near future, but we feel that it is important to support this ongoing work and that there is still more to learn. However, we also recognize that it has been difficult to translate this type of research into action and that we have not seen such research as yet bring about the kind of scale we need to achieve in the residential retrofit industry. Rather than abandon this research area, however, we would suggest that it should continue to be supported.

6 CROSS-CUTTING THEMES

The report on the Roundtable process identified a number of “Synergies” and “Common Themes” that were mentioned by multiple participants in the various roundtables focused on different sectors of the building market. Not all of these synergies and common themes were covered by the interviewees for this follow-up report, but their comments did touch on several of them. Interviewees’ responses are discussed in more detail throughout other sections of this report, but to the extent that they related to the synergies and common themes identified across the roundtables, they are summarized briefly below.

6.1 Synergies

6.1.1 Benchmarking, Rating and Disclosure

As discussed in subsection 4.3.5 (“Work to Capture Energy Efficiency in Home Values”), interviewees expressed a range of views with regard to the value of benchmarking and disclosure efforts. Some interviewees supported adding some kind of energy efficiency rating to local Multiple Listing Service (MLS) systems. There was less clarity, however, as to what type of rating might be appropriate for which circumstances, and one interviewee suggested that that question would be a valuable research topic. Other interviewees noted that in addition to deciding upon a rating, there may be a need to train contractors to gather and input the data correctly.

Some other interviewees doubted the value of energy efficiency ratings altogether for a number of reasons. For example, interviewees questioned whether any ratings were sufficiently reliable or accurate to be used as proxies for increased home values. They also pointed to experience suggesting that ratings could lead to a “single-action bias” in which homeowners often felt that simply getting the rating was all they needed to do to make their homes more efficient. Further, they questioned whether energy efficiency ratings on their own drove sufficient demand, particularly given the costs involved in implementing a rating system.

While some interviewees suggested that ratings were not worth pursuing at all, others suggested that they were necessary but did not go far enough. For example, one interviewee argued that ratings were needed to establish the energy efficiency level of a home, but he felt that having such ratings in place would not spur sufficient voluntary action to reach long-term goals. In his view, rating and disclosure policies ultimately would need to be combined with regulatory policies requiring that homes to be brought up to minimum efficiency standards, perhaps by requiring that they meet a minimum rating level.

6.1.2 The Importance of Utilities to Actively Engage in the Market

Interviewees pointed to several factors that could prevent utilities from being as actively engaged as they should be in pursuing aggressive energy efficiency programs. For example, as discussed in section 4.2.6 (“Acknowledge Other Barriers to More Aggressive Programs”), utilities will tend to dig in against even very cost-effective energy efficiency programs unless a state has implemented a decoupling policy. Even with decoupling, one consultant questioned whether

utilities would be likely to pursue energy efficiency aggressively without a cultural shift or a change in upper management among utilities that have historically been resistant to adopting strong programs. Another consultant suggested that part of the reason that long-term goals should be adopted in legislation is specifically so that energy efficiency advocates can approach regulators when necessary to argue that a utility's programs are not likely to meet those goals. Still another consultant expert suggested that utilities tended to be overly conservative in order to protect their reputations, which could lead to overly burdensome programs that could hamper market development. While solutions like decoupling were proposed to help utilities be more actively engaged in the pursuit of energy efficiency, some interviewees also suggested pursuing alternative frameworks such as establishing more statewide "energy efficiency utilities," or advocating for an increased federal role in energy efficiency initiatives..The Need for Training, Certification, and Quality Assurance of Contractors

Several interviewees supported the idea of increasing training, certification, and quality assurance of residential energy efficiency contractors. For example, as noted above, several interviewees pointed out that qualified contractors would be needed in order to gather data on the energy efficiency of a home, either for purposes of an energy efficiency rating or for some other type of direct assessment of the home's property value in light of its energy efficiency features. Another interviewee felt that by increasing demand for qualified contractors, the residential real estate industry would begin to value qualified energy efficiency work and would distinguish such work as a marketing feature.

With regard to quality assurance, one local program leader stated, "Contractor management and oversight is important so the customer doesn't have to try to go forward with a lack of knowledge." However, few other interviewees specifically touched on this topic.

While the need for technically trained contractors was clear, there was a wider range of views regarding the value of business development training as a strategy for growing the home performance industry. Several interviewees felt that such training or at least peer-to-peer advising was key, while others felt that the industry would be more likely to grow simply by increasing incentives and improving the value proposition to attract contractors. This discussion is laid out in more detail in section 4.3.3 ("Support Private Contractors").

6.1.3 The Need to Have Real Estate Agents, Appraisers, and Finance Institutions Knowledgeable about Retrofits and their Impacts for each Sub-Sector

Several interviewees in the residential sector agreed that there would be value in working with the real estate industry to better understand the value of energy efficiency retrofits. One interviewee suggested that energy efficiency features of a home could be turned into a marketing strategy for real estate agents, particularly if contractors were willing to offer an ongoing service agreement. Another interviewee suggested working with appraisers and the Appraisal Institute to figure out how energy efficiency could be incorporated into home valuations, but she suggested that such an initiative would need to be backed by a powerful

study, a sentiment that was echoed by at least one other interviewee. Another interviewee remarked that it could fundamentally shift the market if banks could be convinced that mortgagees with energy-efficient homes were less likely to default and therefore should be offered lower mortgage rates, all else equal. Again, however, the interviewee noted that making such a case would require a significant research project.

6.2 Common Themes

6.2.1 Compelling Need for Mechanisms to Improve and Drive Demand for Efficiency and Retrofits

While interviewees differed in their recommended approaches, most all agreed that driving demand is critical to scaling up the residential retrofit market. This can be accomplished through multiple means, including broad based and targeted marketing, providing sales and business training and other skills and tools to contractors, funding incentives to customers and contractors, creating home value through rating and labeling, offering innovative financing and approaches, establishing tradable carbon off-sets and increasing energy efficiency regulations. These issues and the different opinions on these approaches are covered in detail in section 6.2 (“Develop Programs to Drive Consumer Demand”) above.

Some interviewees urged caution in relying on government, utilities or programs to drive demand, but instead suggested providing resources to contractors and private businesses and rely on them to deliver the message and sell the services. However, others suggested that we will never achieve our climate goals unless government requires not only that residential buildings receive and disclose energy ratings, but also that owners make actual improvements to meet minimum energy efficiency standards. Other interviewees also supported advocating for incentive increases or other mechanisms as key strategies for scaling up residential retrofits. Several interviewees argued that increased incentives would constitute an appropriate way for the government to help contractors to close more deals. Ultimately, if the retrofit business is profitable for contractors, they will figure out how to sell their services. It would seem that this should be a goal and determinant of program success while serving to drive demand.

6.2.2 The Need to Understand, Reliably Quantify and Document the Non-Energy Benefits

As discussed in depth in section 5.1 (“Substantiation of Non-Energy Benefits”), understanding, reliably quantifying and documenting non-energy benefits (NEBs) is a priority issue for the residential sector. Utility cost-effectiveness tests do not fully capture all of the benefits that result from energy efficiency retrofits as spelled out in section 4.2 (“Develop and Promote New Models for Utility Cost-Effectiveness Tests”) and most interviewees suggest they need to be fixed in order to justify spending ratepayer funds on residential retrofit programs. Substantiating NEBs in terms of jobs, economic development, home value, occupant health, all fuels savings, water savings, etc. is critical to justifying expenditures on retrofit programs. However, the challenge of quantifying NEBs needs to be balanced with the cost to substantiate

them while also considering the regulatory environment in which the utility programs operate in order to consider whether this effort will truly be worthwhile.

6.2.3 Central Role of Utilities in Advancing the Retrofit Market

While many interviewees agreed that utilities should continue to play a central role in supporting and advancing residential retrofit programs, several mentioned moving to a more national model that has its focus on climate goals. While utilities have historically provided a source of retrofit program funding that has been justified by least-cost resource procurement arguments, some interviewees pointed out that this misses the larger issue of the impact on climate, as is the focus of programs in Canada and the European Union. However, the energy efficiency delivery structure in the U.S. is unlikely going to change any time soon, and so most interviewees focused on fixes to that structure to make it more effective, including utility roles within statewide roadmaps, repairing the cost-effectiveness tests, contractor support and creating consumer demand.

6.2.4 Role of Finance

Financing was discussed by many interviewees in the context of potentially helping to drive demand. However, some of the more interesting comments on this topic went beyond just the basic argument that “finance is a key to driving demand” as they talked about specific innovative ways in which financing could play a role in moving the retrofit market. Section 4.3.6 (“Promote Innovative Financing”) discusses how finance can be used to promote positive cash-flow to all customers, provide for third-party arrangements as the solar industry has successfully implemented, and could integrate energy efficiency into home values if certain programs like residential PACE proceed. Financing is clearly a central component to growing the residential retrofit market.

6.2.5 Preparing Cases Studies with “Actionable” Information for Different Target Audiences

Section 5.2 (“Case Studies”) highlights that case studies are a priority research topic for the residential sector. However, quite a few interviewees noted that this work is already being done by DOE and others, so any new work should provide for some new approaches. In addition to some suggestions on enhancing the effectiveness of standard case studies (e.g. looking outside DOE’s Better Buildings participants, focus more on replicability), there were ideas for new approaches. These ideas included developing and maintaining a searchable database that encompasses all programs (not just DOE’s) and allows for comparative metrics to allow apples-to-apples comparisons between programs.

6.3 Consultants’ Take

We agree that there are a number of instances in which taking a cross-sector approach to scaling up energy efficiency would benefit both the residential sector and other market sectors. For example, with regard to capturing the value of energy efficiency in property values, it may be useful to pursue a multi-sector approach that encourages energy labeling and disclosure for all building types, rather than one sector only. In addition to the practical advantages of working out

the appropriate technical mechanisms all at one time, there may also be political momentum in some instances that would encourage a multi-sector approach at an opportune time. We also agree that the importance of utilities actively engaging in the market is a cross-sector issue and that utility programs should pursue energy efficiency aggressively across all markets. In addition, we believe that financing can potentially play a central role in both the residential sector and other sectors, though not necessarily for the reasons that it is often touted (e.g., lowering up-front costs and providing access to capital). Rather, we think it is worth exploring further whether some of the concepts that have worked in the commercial and public sectors, such as guaranteed energy savings, might be applicable in the residential space.

At the same time, we recognize that not all efforts in the residential space will necessarily parallel those in all other sectors. For example, while it is important to identify mechanisms to drive demand in all sectors, it is likely that those mechanisms will differ in some important ways between the residential sector and the commercial sector. In large businesses, in particular, there tends to be a greater ability to step back and identify investments that will improve the bottom line, as well as to devote staff and other resources to those investment projects while taking advantages of economies of scale. By contrast, time, hassle, smaller projects and resources are significant barriers in the residential sector, though these barriers are also likely to be shared by smaller business and nonprofits.

7 GEOGRAPHY

Interviewees were asked about whether they might suggest particular locations for philanthropy to focus their efforts due to particularly promising programs, leaders or organizations.

7.1 Different Approaches for Leading States, Laggards, and Those In Between

Several interviewees suggested that efforts to scale up residential energy efficiency should reach into all markets, including leading states, laggards, and states that were somewhere in the middle. However, the recommended using different strategies to approach these different types of locations.

In terms of leading states, several were mentioned such as Massachusetts, California, New York, Vermont, and Oregon. Consultants suggested focusing on big-picture and cutting-edge issues in these states, such as revising cost-effectiveness screening and perhaps even changing the way that portfolios are evaluated to align more with carbon-based goals. One consultant suggested that the smaller states within this category, such as Vermont, could be promising areas for exploration because they could be more nimble and make changes more quickly.

In states that were farther behind, some interviewees suggested focusing on spreading information and education about the value of residential energy efficiency. Others suggested that even if states could be considered laggards in one sense because they had no programs, there might be a private market that could be tapped into to support a whole-house approach to home improvements. For example, one program implementer suggested tapping into the HVAC contractor network in such states to educate them about the benefits of a whole-house approach. Another interviewee argued that focusing on the “transaction level” in the private market was actually more important than looking at the status of programs in different states.

A number of other interviewees suggested focusing on states in the middle between the leaders and the laggards and trying to bring them up to a more leading position. A number of interviewees put states in the mid-Atlantic region, such as Maryland and Virginia, into this category. Other interviewees pointed to locations such as New Orleans, Louisiana where local leaders were attempting to bring more prominence to the issue of energy efficiency.

7.2 Focus on Areas with High Heating and/or Cooling Costs

Some interviewees recommended focusing on areas with high heating and cooling costs as more likely to push residential energy efficiency because of the greater need. As one program implementation contractor remarked, “Pain drives decisions.” These areas fell into two categories: those with high fuel costs and those that were highly seasonal. With regard to high fuel costs, one interviewee suggested focusing on areas that were more dependent on expensive delivered fuels and less on cheap natural gas. With respect to highly seasonal areas, a number of interviewees suggested focusing less on areas that did not need as much efficiency. For example, one consultant remarked, “I wouldn’t touch San Diego.” Another interviewee, a contractor from the Northeast, commented, “I’ll never do this business in places that don’t have seasons.” Interestingly, however,

another interviewee was in fact a successful contractor from the San Diego area, suggesting that even in temperate locations, home performance contracting could perhaps be successful.

7.3 Continue Supporting Promising Better Buildings Programs

One interviewee associated with DOE's Better Buildings Neighborhood Program (BBNP) highlighted the seven leading BBNP programs as worthy of continued support. These include the following:

- Clean E Works Oregon
- Michigan Saves/Better Buildings for Michigan
- LEAP, Virginia
- NeighborWorks of Western Vermont
- Philadelphia programs:
 - Energy Works
 - Keystone Helps
- Efficiency Maine
- Cincinnati Energy Alliance

She suggested that these grantees (except for Maine) could grow geographically from a local initiative to a statewide one and that all could benefit from additional resources. Alternately, as discussed above, it would be worthwhile to examine why things are working in each of these programs and then figure out how to replicate those successes elsewhere.

However, on the other hand there were reservations among other interviewees regarding the results of the BBNP initiative along with the suggestion that more funding should not be spent on any of them due to a lack of "success", which seems to have a different interpretation between interviewees.

7.4 Explore States in Which an Energy Efficiency Utility Model Could be Effective

One additional idea regarding geography emerged from an interviewee affiliated with an energy efficiency utility. He suggested exploring the possibility of establishing more energy efficiency utilities in states that might be ready to move in that direction. He argued that energy efficiency utilities tend to be more progressive and forward-thinking than traditional utility-run programs, meaning that they would be more likely to pursue all of the ideas discussed above, as well as others. He also noted that statewide energy efficiency utilities bring consistency to programs across an entire state, reducing confusion in the marketplace. In his view, if the energy efficiency utility model "is allowed to grow over the next decade, it will have a much greater impact on energy efficiency than if we continue to operate under the management of utilities or public service commissions."

This interviewee mentioned several specific geographic locations that might be good candidates for exploring the energy efficiency utility model, including New Hampshire, which was sandwiched between two states (Vermont and Maine) that had established energy efficiency utilities. He also

mentioned Wisconsin, Michigan, and New York as possibilities because of the way in which their programs were administered. In New York, for example, energy efficiency programs are already run by a state agency (the New York State Energy Research and Development Authority, NYSERDA) that is independent of the utilities, so moving toward a full-fledged energy efficiency utility model could be less of a leap than it might be in other states.

7.5 Examine Common Building Types and Places Where They Are Located

Finally, one other intriguing idea emerged regarding a different way to think about targeting geographic locations. One consultant suggested that instead of pursuing a few states or jurisdictions first and then going after buildings in those markets, it might be more effective to classify building types into sub-sectors first and then think about the jurisdictions in which those buildings might be located. For example, he noted that there were a number of homes built in the 1960s and 1970s that were all clustered together in suburban settings around the country and likely presented both similar energy improvement opportunities and similar occupant demographics. Similarly, he noted that up and down the Northeast corridor, from Baltimore to Newark, there were a number of locations with many flat-roof town homes that have largely become residences for the lower income market segment. Given that these various different residential building types offered similar opportunities and demographics, he suggested that it might be worth working across these different markets to design similar messages and attractive packages, and then to work with local homeowners to offer these packages in specific locations. He also recommended educating contractors about these different sub-segments to help them understand that “for 80 percent of these homes, they will see the same issues.” He argued that supporting these homes with a coordinated marketing effort would be much more efficient than trying to sell projects through a “door-by-door, home-by-home effort.”

7.6 Consultants’ Take

We agree that different approaches may be needed in different states and local markets and would encourage support for residential energy efficiency initiatives in all geographic areas. The benefits of energy efficiency are often most needed in those markets where they are least often promoted, making the need to promote these benefits in “laggard” states particularly acute. At the same time, transforming the market as a whole also depends on exploring innovations in leading states while encouraging those in the middle to strengthen their efforts. Further, efforts at the state level could be significantly bolstered with additional support at the national scale. Given that climate change is a national and international problem and that residential retrofits are a key piece of the solution, we believe that leaders and stakeholders in this industry do not have the luxury of ignoring any particular market. As such, while we agree that residential energy efficiency retrofits may be easier to promote in markets with high heating and cooling costs, we believe that all markets ultimately must be engaged. Similarly, while we would support continued exploration in the markets of Better Building grantees that showed some promise, would not limit geographic targeting to these areas.

We also support the idea of exploring areas where progressive models and policies could potentially be implemented. This might include exploring whether the energy efficiency utility model may be appropriate in more states, though we would point out that several leading states, such as Massachusetts and California, have been relatively successful with utility-administered energy efficiency programs. In each of these states, however, other key policies are in place, such as “decoupling plus” in California, which allows utilities to collect more revenue from energy efficiency investments than they would make from supply-side investments if they meet certain targets, and a requirement in Massachusetts to pursue all cost-effective energy efficiency prior to investing in supply-side alternatives. We would support exploring whether these types of forward-thinking models and policies could be implemented elsewhere, starting with leading states and the branching outward.

Finally, we were intrigued by the notion of analyzing building types and then targeting geographic markets in which such homes are located, focusing on similar demographic marketing strategies, technical solutions, and training. While we could envision innovative initiatives that incorporated this concept, we would suggest that such a strategy is likely to be only part of the solution to scaling up residential retrofits across all markets. Since we will continually need to understand what motivates customers to act, what works and doesn't work and how to drive action as the retrofit market moves forward. As ratepayer-funded programs strive to trim costs (in order to meet cost-effectiveness tests) and federal funds for energy efficiency (e.g., Better Buildings Neighborhood Program) dry up, there will be a tendency to cut back on basic research. Understanding the consumer decision-making process is another fundamental element underpinning effective retrofit programs that would benefit from on-going philanthropic investment.

8 LEADERS

Some interviewees volunteered names of leaders they felt could be worthy of philanthropic support in the pursuit of scaling up residential retrofits.

8.1 Efficiency First

Several of the contractors who were interviewed for this project, as well as those affiliated with contractor networks, noted that contractors are not brought to the table often enough for important discussions regarding the direction of the residential energy efficiency movement. A number of the interviewees we spoke with were affiliated with the trade organization Efficiency First and recommended working directly with that organization to incorporate the contractor perspective. As one contractor put it, “I want to be really clear about this: Efficiency First is the voice of the contractor. ACEEE has a role, but they do not speak for residential energy efficiency. At the end of the day this work gets done in homes, in attics, by the contractors. If you want this to work, you have to put more people in more houses. Efficiency First is on the front lines of that effort. No other organization understands this as well as they do or understands the contractor base as well as they do, so I’m emphatic about that.”

8.2 Support a New Organization Focused on Home Values

One interviewee suggested “...providing an IMT (Institution for Market Transformation)-like home for the green real estate efforts of Laura Stukel...”. Laura Stukel is a Realtor from the Chicago area working with CNT Energy and is a national leader advocating for rating and valuing green features in real estate transactions and the MLS. Given the discussions above about the importance of transforming the residential market to recognize and value energy efficiency, it is clear that much work needs to be done in this area. Philanthropy could help support an organization that focused on green home valuation issues.

8.3 Others

Other names listed as leaders possibly worthy of support included the following:

- Geoff Chapin, Next Step Living (MA)
- Vermont Energy Investment Corporation/Efficiency Vermont (VT)
- Ludy Biddle, NeighborWorks of Western Vermont (VT)
- Homeownership Centers (generically)
- Anne Duncan Cooley, Upper Valley Housing Coalition (VT/NH)
- Rob Schultz, COVER (VT)
- Kerry O’Neill, Neighbor to Neighbor (CT)
- AFC First (PA)
- HEAL (Clinton Climate Initiative) (AR)
- a. Andy Holzhauser, Greater Cincinnati Energy Alliance (OH)
- Jeremy Hays, Green for All (Seattle or California)
- Eileen Quigley, Climate Solutions.org (Pacific NW)
- Bill McKibben, Middlebury College (VT)

- Rep. Peter Welch (VT)
- Affordable Comfort Inc. (PA)
- NRDC
- Sierra Club
- Center for Energy and Environment (MN)
- Jerry Unruh, ABC cooling, (Fresno, CA)
- Ken Justo, ASI Hasting (San Diego, CA)
- Ray Isaac, Isaac Heating and Cooling, (Rochester, NY)
- Brad Bartholomew, Bartholomew Heating and Cooling, (Kalamazoo, MI)
- Devon Hartman
- Gainesville Municipal Utility (FL)
- Kansas City Power & Light (MO)
- LBNL
- California Energy Commission
- California PUC
- National Association of Rural Electric Coops
- ACCA

8.4 Consultants' Take

In our experience, several organizations have been critical to advocating for advancements in residential energy efficiency policies, and energy efficiency more generally. Some of the more prominent and effective organizations we are familiar with include, but are not limited to, the following:

- American Council for an Energy-Efficient Economy
- Efficiency First
- Environment Northeast
- Institute for Market Transformation
- National Home Performance Council
- Natural Resources Defense Council
- Regulatory Assistance Project

We agree that contractors should be a part of all major residential energy efficiency discussions and initiatives, which can be accomplished in large part by more frequently giving Efficiency First a seat at the table.

We would also recommend working with state energy offices, public utility commissions, and related oversight boards—as well as progressive utilities and program administrators—to advance energy efficiency policies at the state level. It may be easiest to promote cutting-edge or transformational policies in areas such as the Northeast and West Coast that have historically been willing to try out new ideas in the energy efficiency field. Ultimately, however, it may be just as important to work with leaders in states that are farther behind, as well as advocate at the federal

level, to ensure that residential energy efficiency becomes a greater priority in all markets across the nation.

9 APPENDIX A: List of Interviewees

- Greg Thomas, Performance Systems Development
- Ludy Biddle, NeighborWorks of Western Vermont
- Larry Zarker, Building Performance Institute
- Philip Henderson and Lara Ettenson, Natural Resources Defense Council
- Merrian Borgeson, Lawrence Berkeley National Laboratory
- Matt Golden
- Mark Dyen, Conservation Services Group
- Ben Adams, MaGrann Associates
- Gaye Symington, High Meadows Fund
- Dana Fischer, Efficiency Maine
- Steve Baden, RESNET
- Diane Ferington, Energy Trust of Oregon
- Emily Levin, Efficiency Vermont
- Danielle Byrnett, U.S. DOE
- Mike Rogers
- Joe Kuonen, CleaResult
- Cynthia Adams, Local Energy Alliance Program (LEAP)
- Kai Millyard
- Sean Penrith, Cake Systems
- Richard Riegel Burbank, Evergreen Home Performance
- Bob Knight, BKi
- Patricia Plympton, Navigant Consulting
- Claire Johnson, Next Step Living
- Ken Justo, ASI Heating and Air
- Dan Kartzman, PowerSmith
- Chris Neme, Energy Futures Group
- Suzanne Shelton, Shelton Group

10 APPENDIX B: Draft Questionnaire, Residential Sector

The Energy Foundation recently held a Building Retrofit Industry and Market (“BRIM”) Roundtable to discuss what policy and program approaches were most promising to stimulate deep residential retrofits in the single family residential market and “go to scale.” In addition, four other roundtables were held with experts from other sub-sectors (commercial office, commercial retail, multifamily and health care). Each roundtable was asked to recommend their top three “**approaches**” and top three “**research needs**” to help bring retrofits to scale in their subsectors. The Energy Foundation has hired Energy Futures Group to test the Roundtable’s recommendations with an array of leaders within the residential market, and to identify interventions required to bring “deep residential retrofits” to scale. The Energy Foundation is particularly interested in what role philanthropy can play in this effort.

The top three approaches identified by the expert Roundtable were as follows:

1. Develop State Roadmaps: investigate how a self-sustaining program can be launched and maintained. Identify leaders and build advocates. Develop business models; train in areas other than retrofit technologies and techniques: business training, marketing training, lender education, focus on low-moderate income families.
2. Develop and Promote New Models for Utility Cost-Effectiveness: De-coupling has not been adopted in many states, and there are few real utility incentives to promote energy efficiency in most states. Examine how non-energy benefits from energy efficiency retrofits can be incorporated into utility cost-effectiveness tests, and develop new models for utility tests. Work to educate regulators, legislators, and others on the benefits of these expanded tests.
3. Develop Programs to Drive Consumer Demand: Promote benchmarking or rating—incorporated into Multiple Listing Services (MLS); improve marketing and sales tactics; promote open access to utility data and obtain data to analyze it in combination with existing program successes; explore innovative measures to interest customers; build a strong ad campaign linking energy efficiency to other national goals; be innovative – look internationally for inspiration; develop programs at key points in the life-cycle of the home; understand better who is taking advantage of utility, tax incentive and other programs and why, then replicate it and expand.

The top three research issues identified by the expert Roundtable were as follows:

1. Full Substantiation of Non-Energy Benefits: Document the impact of energy efficiency retrofits on jobs economic development; home value; health. Understanding this is needed to enhance utility programs; access economic development funds. Perhaps develop a methodology using standard development process like ANSI for credibility.
2. Best and Worst Practices for Program Delivery: Document through case studies, as well as document the impacts of energy efficiency retrofits on homeowners.
3. Research Consumer Decision-Making Process: Obtain a better understanding of what drives consumer behavior to do energy efficiency retrofits and how to then integrate these factors into seamless program of marketing delivery with financing options. Speak with utilities, market research firms, others.

Questions for Experts

In light of the above Roundtable recommendations, and in recognition of your expertise in the residential energy efficiency field, the Energy Foundation would be very interested in your answers to the following questions:

1. Background

What is your role in the industry and what role have you played in building energy efficiency strategies?

2. “Approaches”

What is your overall reaction to the “top 3” approaches to advance building energy efficiency that emerged from the sector panel? Are these approaches likely to have a significant impact on the energy efficiency retrofit market in the residential sector? If so, why? If not, why not? In your opinion, are any of these approaches more important than the others? Would you have recommended other strategies in your “top 3” list?

- a. General description of the strategy
- b. Philanthropic investments that could best advance the strategy

3. “Research Needs”

What is your overall reaction to the top three “research priorities” to advance building energy efficiency in the residential sector that emerged from the sector panel? Are there other research priorities that would have more impact?

4. Role of Philanthropy

Is there a particular role that philanthropy is well suited to play in this market? Be specific in terms of what specifically and what scale.

5. Geographical Markets

Are there particular geographic markets that, due to the policy climate, mix of players, dynamics of the real estate market, etc., are well positioned to take building retrofits to scale, or test a particular intervention? Where? Why there?

6. Leading Individuals/Organizations

Are there particular individuals or institutions that are good candidates for playing an active role in promoting the implementation of the approaches you find the most promising? Are there other individuals you think it is important for us to talk to in this strategy development process? These individuals could be private sector or governmental officials at any level. Academic, national laboratory and NGO organizations are less critical to identify at this point but can be included.

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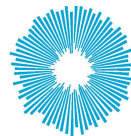
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