REPORT ON EXPERT RECOMMENDATIONS TO INCREASE THE PACE AND SCOPE OF THE BUILDING RETROFIT MARKET

OCTOBER 2012

James L. Wolf
Energy & Environmental Consultant
309 Yoakum Parkway #1105
Alexandria, VA 22304
Project Director BRIM
JamesLWolf@comcast.net
(703) 751-2081

CONTENTS

1

PURPOSE AND PROCESS

SIX PHILANTHROPIES are collaborating to see what they—and others—might do to rapidly increase and scale the energy efficiency retrofit market and achieve "deep" retrofits for buildings in the United States. The philanthropies know there are, and indeed have sponsored, many excellent pilot programs. The philanthropies are the Doris Duke Charitable Foundation, Energy Foundation, Kresge Foundation, Living Cities, MacArthur Foundation, and Rockefeller Foundation. Several other foundations are informally following the insights obtained from this effort.

The philanthropies extensively discussed what the terms "deep" retrofits and "scale" mean. 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.

This activity builds on earlier work sponsored by some of these foundations on the Building Retrofit and Industry Market (BRIM). That work synthesized valuable information on market sizing and characteristics of various subsegments of the building market. See: rockefellerfoundation.org/news/publications/building-retrofit-industry-market-brim.

Each of the six philanthropies has its own unique interests in specific subsectors of the building market and the many benefits that energy efficiency can provide, ranging from more affordable housing to job creation to fewer carbon dioxide emissions. Yet, the benefits of collaborative action became apparent during this process.

The philanthropies decided to focus on five subsectors of the building market. This decision was based on individual foundation priorities as well as information uncovered in the first phase of the BRIM project on the potential for savings. The five subsectors studied further here are commercial office, commercial retail, single family residential, multifamily, and health care.

Five separate roundtables with 10 to 12 experts were convened in the summer of 2012 to cover each of the subsectors. The experts invited represented stakeholders relevant to the building market. Each roundtable included representatives from retrofit service companies, equipment providers, finance, building owners, utilities, federal and state officials, nonprofit organizations, and others. The list of experts is at the end of this report. The key issues explored at each roundtable were 1) the current market dynamics that affect the retrofit market, 2) the most promising approaches—policy or program—to stimulate the retrofit market to go to scale, 3) the research needs that must be addressed to implement any of the promising approaches, and 4) synergies and common themes that cut across the five subsectors. After discussion of the most promising approaches and research needs, the experts were asked to recommend the top three approaches and research needs. Many of these top three approaches are a combination of ideas presented in discussion.

The results of these expert roundtables are presented in this summary. This group of six philanthropies has not formally endorsed the findings or recommendations of the roundtables. They are presented here to help inform and spur the thinking of the wider community interested in these issues, as they have for the foundations that sponsored this effort. The last section on "next steps" details what further actions the philanthropies will be taking as part of this continuing effort.

COMMERCIAL OFFICE

2

COMMERCIAL OFFICE

A. MARKET DYNAMICS

The following are key dynamics described by experts in attendance.

The foundations need to differentiate among Class A, Class B, and other office space and decide which one to focus on. The needs of the different classes of space vary greatly, so program delivery for retrofits must be customized for each class much more than is currently being done by utilities, governments, or foundations. Class A space has the ability and resources to best take care of itself and does not need specific foundation programmatic support. However, some of the approaches discussed below, such as benchmarking to stimulate demand, can help encourage this portion of the market to take action.

It is important to work simultaneously on the macro-level issues and at the local level. This will improve the approaches and likelihood of success as the lessons learned feed into each other.

It is hard for many stakeholders to get data about the energy consumption and usage of a building and the equipment currently in a property. This limits the ability of analysts and equipment or service providers trying to understand the market. Even property owners have difficulty at times getting data they can use from their utility. If the data is to be used for purposes such as market analyses by policy makers or market participants, a means to aggregate data and ways to maintain confidentiality may be needed.

Many properties are currently "underwater," which presents both a challenge and opportunity in the designing of program approaches. To encourage retrofits, it is critical to make information available about their impact on property value, since energy-efficiency savings alone will not be a sufficient market driver. Other benefits of retrofits, such as the productivity and health of an office's occupants, are also important. Detailed case studies concerning these benefits are very helpful.

Program delivery needs to be simplified. The process has to be relatively fast and not require too much effort on behalf of the property owner. Many voluntary "challenge" programs currently exist at the local and national level on a variety of issues including retrofits, but property owners warned of "challenge fatigue." Commercial Property Assessed Clean Energy (PACE) programs are a potentially promising approach, but substantial work needs to be done before they will be taken up in earnest. Pushing for standardization on approaches such as financing, ratings, or other elements seems premature, but different approaches should be tried with an emphasis on replication and learning. In the design of program delivery, it is valuable to use existing networks, such as local chapters of the Building Owners Management Association International (BOMA), instead of trying to create something new.

Improving buildings' operation and maintenance is often an overlooked opportunity for significant energy savings and needs more attention. Improving tenant behavior is also important.

B. PROMISING PROGRAM OR POLICY APPROACHES

The following content includes current and needed programs and policies as described by experts in attendance.

Many potentially promising approaches arose from the discussion, some of which overlap. No one approach was deemed best, so experts recommended that pilots could be conducted in five to seven cities to test different approaches like benchmarking.

Organizations already running innovative programs like the New York City Energy Efficiency Corporation (NYCEEC) could be funded to expand. The NYCEEC is a promising model that has received much attention in the field, and so may offer the best way to achieve results and learn from experience.

Multiple models of financing—PACE programs, utility on-bill financing or repayment programs, mortgage refinance, and others—should be tested. The programs should be highly visible in the marketplace and should document and share the lessons learned from their operations.

Any approach should focus on obtaining more specifics on program design and operation as well as individual building performance. Better information is needed on retrofit costs, performance, and experience with financing programs.

Approaches should develop detailed case studies with actionable information that the financial community or property owners can use to make decisions. To be effective, case studies should be written for different audiences and customized for their needs. These case studies can also help fill another expressed need—to educate brokers, owners, appraisers, and others on all aspects of retrofit performance, financing, and impacts.

In addition to traditional grant making, foundations could use program-related investments (PRIs) to catalyze a larger pool of money for retrofits; ensure that the managers of their own real estate assets, or the assets of endowments they are invested in, examine the benefits of retrofits; and have their board members encourage community leaders to begin retrofitting their properties.

TOP THREE PROGRAM AND POLICY APPROACHES

1. **Conducting prominent pilot projects in five to seven cities. A limited number of specific marketing tools, financing tools, benchmarking, and delivery mechanisms should be developed, as should specific criteria for choosing the pilots' locations.**
2. **Supporting a prominent existing approach such as NYCEEC, which is trying new financing structures for how retrofits could be funded. One of NYCEEC's noteworthy goals is to show demonstrable results in order to attract the private finance community to the retrofit market. While new mechanisms may be needed, it makes sense to first maximize the potential of promising existing approaches.**
3. **Exerting foundation leadership by using PRIs, examining the endowment's real estate investments, and having board members or senior executives encourage community leaders to pursue retrofits.**

As a part of all three approaches, detailed case studies should be prepared, containing the necessary actionable information for the different audiences that must be involved to move the market.

C. RESEARCH NEEDS

The following research needs were identified:

- Developing case studies with actionable information for different audiences to address these and other questions: How did the investment happen? What were the motivating factors? How was it financed?
- Determining the impact of retrofits on the asset value of the building.
- Developing ways to quantify "non-energy benefits" such as productivity, tenant health, and tenant retention for different audiences, including public service commissions, consumer activists, financers, and property owners.
- Researching customer acquisition strategies. What works and does not work? What needs to be learned from the existing programs of utilities, service providers, or others? Do tenants want green buildings, and if so, why? A better understanding of who and what influences the key decision makers is needed.
- Exploring ways to better link existing building codes to performance measurement, evaluate existing programs' performance, and disseminate critical information.
- Determining priorities for assembling and disseminating existing knowledge or obtaining new, needed information regarding codes and retrofit programs. For example, comparatively little is known about the performance of retrofitted smaller commercial office buildings.

TOP THREE RESEARCH NEEDS

1. **Developing a body of detailed case studies as part of a tool kit. The case studies should be written for different audiences and cover all issues affecting whether they take action on retrofits, from the motivations of the owner, to how the project was implemented and financed, to asset performance and impact on non-energy benefits. All data should be of commercial quality. Case studies should not focus on special "Empire State"–type buildings that have undertaken retrofits, but should include more typical or representative properties.**
2. **Exploring how to build the demand for retrofits. It is necessary to learn from ongoing programs and design better customer-acquisition strategies.**
3. **Rigorously analyzing how to measure non-energy benefits, particularly the impact of retrofits on the asset value of the building. Other key non-energy benefits should be explored, such as the impacts of retrofits on occupant health, productivity, and tenant retention.**

COMMERCIAL RETAIL

3

COMMERCIAL RETAIL

A. MARKET DYNAMICS

The following are key dynamics described by experts in attendance.

The retail sector is very diverse, and large national or regional chains with big stores engage very differently than do small retail stores. In some respects, small retail is closer to the residential or multifamily subsectors. Important market dynamics shaping the demand for retrofits are that many large retailers are downsizing, in part due to online shopping, and many are moving downtown.

Many developers and tenants will not share data and are very distrustful of efforts to obtain it, so it is important to work through organizations they are comfortable with. It would be beneficial to bring together the different data sources and data-site developers—both energy and financial—so they can work more closely with trusted organizations to develop actionable data.

Recognition for prizes or awards are not an effective way to take the market to scale, for two reasons. First, these are usually a one-time event. Second, and more importantly, the retail sector is very diverse. There are many different categories of buildings in this sector. For example, there is no ENERGY STAR certification for retail stores, and owners present said they and their colleagues were tired of waiting.

Finally, just working with retailers might have limited impact. It is important to spread awareness of the impacts of energy efficiency retrofit and actions through the whole retail supply chain, from manufacturers to distributors to retailers.

B. PROMISING PROGRAM OR POLICY APPROACHES

The following content includes current and needed programs and policies as described by experts in attendance.

An analysis of "bright spots," or successful retrofits, could be directed to the "C" suite—top executives such as the "c"hief financial officer, "c"hief executive officer, and so on, who have the power to institute large-scale company changes. The analysis would document what has been successful so it could be replicated. A comprehensive benefit analysis could quantify the impacts of retrofits, from asset value to jobs to health to retail sales, and provide this information to decision makers in an actionable form.

Partnerships with a defined core group of retailers and property owners could be established to create a commitment and strategy to do retrofits. Such partnerships would supplement existing government or utility programs or would operate in conjunction with them. A potential model might be the way the dairy industry committed to particular actions on energy retrofit technology. A plan was created with extensive participation, so it received large support and uptake.

A "one-stop shop" or "easy button" for retrofits could be developed and promoted. The shop would contain tools for owners, contractors, and others on financing, technologies, and other aspects of retrofits. It could be a web-based tool kit supplemented by experts on call. The tool kit could include a list of all incentive programs by geographic location, as well as tools to map job and other impacts by location.

Green-energy leases specialized for retail operations would be valuable and could generate demand, as could a mandatory benchmarking program. These types of leases

tackle the split incentive problem, where owners cannot recoup cost savings from energy improvements since tenants pay for utility costs.

Job training and credentialing of contractors would also be valuable. The shortage of reliable, qualified contractors inhibits the growth of the commercial retrofit market.

Finally, elevating the importance and stature of energy efficiency to the public and key decisions makers—owners, retailers, and policy officials—is an overriding need.

TOP THREE PROGRAM AND POLICY APPROACHES

1. **Developing incentives and better data. This would include mandatory benchmarking at a state or regional level and the creation of regional competitions. The competitions could be conducted using EPA's Portfolio Manager, working with the International Council of Shopping Centers as a trusted intermediary. Standardization on benchmarking approaches is a goal, but would be premature now. As part of this effort, a database would be created by working with existing data-development and data-gathering groups to compile information needed by owners, retailers, service providers, and the finance community on topics such as energy consumption and financing.**

2. **Funding multistakeholder partnerships to supplement existing state/federal and other service programs. This approach would have three elements:**

   - **Engaging in multistakeholder collaboration across the supply chain to commit to goals and strategies and identify opportunities for retrofits, using the dairy industry partnership as a model.**
   - **Sending senior fellows from nonprofits or elsewhere to a site to actively problem-solve. They would engage with decision makers, especially "C" suite executives, and champion those who utilized strong tools or techniques.**
   - **Analyzing "bright spots" and preparing case studies documenting the business case for retrofits. The case studies would record what was done, why and how it was done, and what the effective messages were. They would define and document the "short path" to solutions.**

3. **Conducting a "Main Street challenge," like the Better Buildings program operated by the U.S. Department of Energy (a site-based approach) but focused on smaller owners and retailers. "One-stop shops" would be developed for all retrofit needs, including a website with experts on call to answer questions and direct inquiries to local organizations.**

C. RESEARCH NEEDS

The following research needs were identified:

- Developing mechanisms to overcome split incentives between landlords and tenants.
- Customizing green-energy leases, which are an important solution to the split incentive issue, for the retail sector.
- Documenting "bright spots" to convey the reasons and motivations for the retrofit, what it took to get action, and specifics on how and what was done.
- Researching and documenting how to assemble pools of capital to finance retrofits. Utilities, federal and state tax incentive programs, community development funds, program-related investments (PRIs), and other sources of capital may be available, but it is difficult to understand how to package them as part of a retrofit project since each has different rules.

- Mapping utility and other incentives by geographical location. An online map would help owners and retailers visually understand what financing options were available to them based on their service territory and location.
- Learning how shoppers respond to retrofitted or green retail space and using this intelligence to encourage and promote sustainable retrofitting.
- Developing a better understanding of retailers' needs, energy uses, and such, and how they vary by retailers' size and characteristics. Segmenting the market can be helpful in devising strategies that are effective in persuading different types of retailers to do retrofits.
- Researching the net benefits of retrofits—including impacts on health, tenant retention, sales impact, and asset value. Energy efficiency benefits alone may not make a sufficient case to retail tenants or property owners for doing retrofits. This information would also be valuable to utilities and government agencies.
- Researching whether there is a correlation between a company's performance on energy efficiency and its stock price. Caveats: This can be examined only for large companies, and the linkage, if any, may actually be between the quality of management and stock price.
- Developing an optimization strategy for HVAC rooftop units. They offer an often overlooked opportunity for savings.
- Clearly identifying the actionable data needed by different stakeholders—retailers, owners, finance institutions, and the like—to complete retrofits and then locate existing sources or collect missing data.

TOP THREE RESEARCH NEEDS

1. **Understanding how to integrate different pools of capital. Different rules exist for each, and they are hard to understand. Developing a financing "playbook," including the rules for integrating different sources and a map by geographical location of capital sources, utility incentives, and other programs available, would greatly help.**
2. **Sharing success stories of "bright spots" to influence the "second tier" of companies. While leaders may have already done retrofits, the second tier can benefit greatly from detailed success stories. Documenting who has done a retrofit, what was done and why, how it got approval internally, how it was financed, and what the results were can help inspire many companies to take action.**
3. **Better understanding motivations and benefits. What do retailers, owners, and customers want and why? What are the best means to reach them from a program perspective? What are the critical non-energy benefits of retrofits, such as asset value, employee health, sales, and tenant retention, and how can they be reliably calculated? In this context, it will be essential to work with both the appraisal and brokerage communities.**

SINGLE FAMILY RESIDENTIAL

4

SINGLE FAMILY RESIDENTIAL

A. MARKET DYNAMICS

The following are key dynamics described by experts in attendance.

Mortgage and housing problems continue and are particularly severe in some parts of the country. Philanthropy may wish to concentrate its efforts on low- and moderate-income people because of the belief that most federal aid programs like the Weatherization Assistance Program are aimed at the very poor.

The U.S. Department of Energy's large, far-reaching Better Buildings program will issue lessons learned in the fall of 2012, and foundations should integrate those lessons into their new programs. Once the Recovery Act funds expire, it is unclear what will happen to programs and institutions receiving support. This expiration could adversely impact the retrofit market. Foundations do not have the resources to totally make up for this loss of federal funds, but they should be conscious of it as they develop their programs.

In terms of new program delivery and design, foundations should consult not just energy experts, but also community leaders, behavioral experts, and others. Any program and delivery approach needs an "enabling environment" to be successful, and research should be conducted on what constitutes such an environment and how to foster it. To get the market to scale, statewide policy approaches seem the most promising, but almost all current programs are based in communities or utility service territories. On-bill financing and repayment programs, where efficiency loans are repaid through an existing utility bill, are another promising approach and should be offered by many more utilities. State public utility commissions should encourage all utilities in a state to implement these programs.

Service delivery is a severe problem. Contractor training is needed, coupled with a way to give homeowners' confidence in contractors' recommendations, their work quality, and retrofit performance. "One-stop shops" combining financing with service delivery might help if homeowners are confident that the contractors are qualified and recommending only needed work.

There is a need for more information and actionable data on both best practices and failures in program design and service delivery. These findings should be widely shared so new approaches can be developed and current ones improved.

B. PROMISING PROGRAM OR POLICY APPROACHES

The following content includes current and needed programs and policies as described by experts in attendance.

Roadmaps for statewide programs that include critically needed aspects for success should be developed. These roadmaps would investigate and recommend how a self-sustaining program can be launched and maintained; identify leaders and advocates; and conduct training in areas other than retrofit technologies, such as business training, marketing training, and lender education. The roadmaps would focus on low- to moderate-income families.

Mechanisms to drive consumer demand for retrofits should be promoted by Foundations, governments and utilities. A comprehensive approach would include benchmarking; improving service marketing and sales tactics; securing open access to utility data and analyzing it in combination with existing program successes; exploring innovative measures to interest consumers, including those used successfully in other countries; and building a strong advertising or public service campaign linking energy efficiency to other important national goals. Learning both who participated in

to drive demand. Ratings, disclosure, and on-bill financing are all critical to building demand.

Engaging with the real estate community is also necessary to build demand. Mechanisms are needed that show real estate agents and appraisers the positive impact of retrofits on home value.

Policies and programs to connect energy retrofits to other expected transactions over the lifetime of a house should be developed. Approximately 75 percent of renovations (often kitchens and bathrooms) are done in the first year of ownership. Other opportune times are when HVAC systems are being replaced due to equipment failure; when large-scale renovations are undertaken; at time of foreclosure or mortgage refinance; and during natural disaster recovery.

Roadmaps for all aspects of retrofits for different audiences could expand the market. The roadmaps would cover elements such as financing, marketing, contractor quality, and inspection. The audiences would include state or local officials, contractors, homeowners, and financers.

Developing and promoting new cost-effectiveness models for utility energy efficiency programs, which define efficiency as a broad resource, would stimulate the retrofit market. Current models used by most states' public service commissions to evaluate utility programs do not account for myriad societal benefits, such as health improvement, that can be attributed to energy efficiency. At best, in a very few states the cost-benefit tests "decouple" profits from sales. It is critical to work with consumer groups, such as AARP, which have expressed concerns about potential impacts on electric rates, and shift the discussion to the impact on total bills rather than just utility rates. Evaluation of energy efficiency programs should focus on the total societal resources being used and all of the societal benefits.

Sharing data and developing better information mechanisms will stimulate the market. The market needs better data and the ability to integrate data that exists separately among utilities, banks, and others to better drive transactions. Data and information from multiple servicers needs to be collected, synthesized, and analyzed. Better information on programs and approaches, such as experience with different financing programs, rating or benchmarking programs, and the results of retrofit programs, will enhance the market's effectiveness and smooth its operation. The data and information have to be developed and presented in a form usable for the intended recipient.

Private companies could help stimulate consumer interest. Manufacturers of green or sustainable products could provide incentives for their employees to undertake retrofits in their homes. Employees could encourage their neighbors or coworkers to do the same and share experiences.

TOP THREE PROGRAM AND POLICY APPROACHES

1. **Preparing roadmaps for and supporting statewide programs. Statewide approaches are best suited to taking residential retrofits to scale. The roadmap elements are detailed above; philanthropy could develop them in partnership with others such as governments or utilities.**
2. **Developing and promoting new tests for utility cost-effectiveness; the issues involved are detailed above. The tests being applied by public service commissions affect the ability of a utility to promote energy efficiency in every sector, not just the residential sector, which makes this a high priority.**

3. **Developing programs to drive consumer demand. Driving demand encompasses a variety of activities, including: publically disclosed benchmarking or ratings with multiple listing services (MLS) or the like; improving marketing and sales tactics; developing easier financing mechanisms, such as on-bill financing and repayment; opening access to utility data and analyzing it in combination with existing program successes; and exploring innovative measures to interest consumers. These should be keyed to points in the life cycle of the home, such as refinancing. The approach should be kept simple and not too time consuming. Valuable lessons could be learned by better understanding who is taking advantage of existing programs and why, as well as who is not participating and why. Based on this information, programs could be expanded, replicated, or modified as appropriate.**

C. RESEARCH NEEDS

The following research needs were identified:

- Understanding and quantifying non-energy benefits, such as job creation, economic development, home value, and health. With this information, utility programs could document new benefits, economic development funds could be applied for retrofits, and "market driver" programs could be designed.
- Evaluating and detailing the best and worst program design and delivery practices. Publicizing these results to utilities, government agencies, and private sector companies is necessary to make them effective.
- Preparing separate, detailed case studies on key issues for different target audiences (homeowners, financers, and others), because each audience needs different types of actionable information. Issues would include the impacts of retrofits, their costs, and their delivery and financing methods.
- Understanding how to assemble an investment portfolio of projects and program-delivery opportunities so that financers—including perhaps foundation PRIs, service providers, and others—will feel confident that the portfolio can achieve good results. Individual investments in retrofits have potentially more risk than a portfolio approach. Portfolio investments would have different needs, but new developments like insurance could strengthen this approach.
- Understanding what residential market segments are being served by which program types to assist in program design. How are utility or government programs reaching different subsectors of the residential market? Learning how effective such programs are and what could be changed to make them more effective would be beneficial to expand their market reach.
- Learning what drives consumers to take action. What are the primary motivators of action—desire for more comfort, lower bills, community involvement, or other factors?

TOP THREE RESEARCH NEEDS

1. Developing a methodology for the full substantiation of non-energy benefits, including job creation, economic development, home value, and health. This would help enhance utility programs, access economic development funds for retrofits, and develop better marketing materials. Endorsements from many different stakeholders for the resulting methodology would ensure credibility. To withstand criticism on this likely controversial topic, the community should consider using the American National Standards Institute (ANSI) to develop the methodology.
2. Preparing case studies documenting several items, including the best and worst practices for program delivery for governments, utilities, and service providers, and case studies of impacts on homeowners that could be used in marketing and delivery design.
3. Gaining a much more nuanced understanding of what drives consumer behavior to do retrofits, and then seamlessly integrating this learning into the marketing, financing, and delivery of retrofits.

MULTIFAMILY

5

MULTIFAMILY

A. MARKET DYNAMICS

The following are key dynamics described by experts in attendance. The multifamily roundtable had the most experts, representing the diversity in the market.

There is a need to define what the "multifamily" market is. Is it buildings with five or more apartments? Different organizations have different guidelines for what they consider multifamily. The market has three tiers—subsidized, low- to moderate-income, and higher-income—and within those tiers the housing stock varies widely in age and composition. In utility and government programs multifamily is often included in residential programs, but it should be its own category.

In part due to current economic conditions, the market is seeing a move toward renting rather than owning. Leases are typically very short term, which results in less interest in retrofit measures with longer payback periods due to the split incentives between landlord and tenant. The overall energy cost in many multifamily units may be low in absolute dollar terms, but it is not low as a percentage of the tenant's income. Tenant behavior is critical in this sector and often does not receive sufficient attention; the HUD Innovation Fund's work on this aspect of potential energy savings is instructive.

A better understanding of the value of non-energy benefits is needed, since energy efficiency savings alone may not be a sufficient driver for "deep" retrofits. These benefits include health, job creation, and asset value. On a cautionary note, retrofits—or even a good rating, in areas where disclosure is required—might make the property more valuable and therefore decrease housing affordability if higher rents could be justified.

The process for considering, financing, and implementing retrofits through many of the current program delivery mechanisms is simply too complex for most owners, and must be simplified.

Several potential financing sources are available, such as utility incentives, tax credits, and community funds, but there is confusion in the marketplace about how to package and assemble financing from these different sources and the particular requirements for each.

Programs, such as those offered by utilities, that focus on individual pieces of equipment for a "one-shot" retrofit spur action for specific upgrades but make it harder to go back to the same customer later to undertake a more comprehensive retrofit. Targeting opportunities to do retrofits, such as at the time of building rehabilitation, equipment replacement, or refinancing, is important.

Philanthropies need to consider the right sequence for their actions in order to intervene appropriately and effectively with market dynamics. For example, if the local financial community does not believe it has sufficient information to have confidence in financing retrofits, obtaining that information and working with that community should precede the launch of a program aggressively promoting the benefits of retrofits.

B. PROMISING PROGRAM OR POLICY APPROACHES

The following content includes current and needed programs and policies as described by experts in attendance.

Benchmarking and disclosure of the building's energy use is potentially a large demand driver for retrofits. The work to benchmark a building may impose costs on owners, so incentives to defray costs should be considered when benchmarking is not mandatory.

Sustainability, including energy efficiency as well as other components, could become a federal mandate. The model for this approach is the Americans with Disabilities Act (ADA), which requires that an existing building be made accessible to the disabled when it undergoes a major modification.

A center of excellence for the multifamily sector, which would house information and financial and technical experts, should be established. This could be a step toward a potential "one-stop shop" where interested owners could seek advice and be quickly connected to resources. The center could network with regional and local service providers to help the market move more quickly.

Developing special-purpose energy-service companies, or ESCOs, exclusively for multifamily properties could transform the subsidized multifamily market. These ESCOs could still be available for other parts of the multifamily market as well. The "traditional" ESCO does not adequately serve the multifamily market for a variety of reasons. Extensive due diligence on how to establish, operate, and finance ESCOs is needed to determine if they are truly a viable option. A special-purpose ESCO would also be valuable in testing how to aggregate smaller multifamily buildings to reduce retrofit transaction costs.

Financing options, in addition to the special-purpose ESCO, include two related approaches: a national fund for multifamily retrofits and the strategic use of foundation funds for retrofits, which could be an element of a national fund. The national fund could, for example, purchase securitized debt issued by private financers of retrofits. It could be used strategically as a loan loss reserve, credit enhancement, or to buy securitized debt. Foundations would participate in order to galvanize the market and assist until private capital could take over once the business models and opportunities are proven.

Data and information are important both to attract financing and to give property owners confidence in results thus driving demand. A data warehouse and analysis center could be established that would offer actionable information on retrofit performance, financing, and related issues. The center could also compile case studies of best practices for program delivery, financing and other market approaches, as well as their results.

State policy roadmaps could be prepared, detailing what needs to happen in each state to get the multifamily retrofit market running effectively. The roadmaps would emphasize policy but also include other items, such as the preparation of effective marketing materials.

TOP THREE PROGRAM AND POLICY APPROACHES

1. **Establishing a center of excellence, including a web-based "one-stop shop" staffed by personnel who would respond to questions and direct inquirers to appropriate local organizations or experts. Regional or state experts would feed into the national center, and the national center would similarly feed back to the regions. The center would house the data warehouse and analysis functions to serve the market and would prepare case studies highlighting best practices.**
2. **Addressing finance needs. Initiatives would include the preparation of a business plan for a special-purpose ESCO and a plan for how to source capital and start a national fund for retrofits. The national fund would need some foundation support through PRIs or other means. Foundation support could serve a variety of functions from loan loss reserves to credit enhancements, but mainly it would be a catalyst to attract private capital.**
3. **Establishing rating and disclosure programs, either voluntary or mandatory. If the program is voluntary, incentives to building owners should be provided to encourage participation. In addition, there should be documentation of how disclosure and rating systems are working in the few locations where these programs are currently operational.**

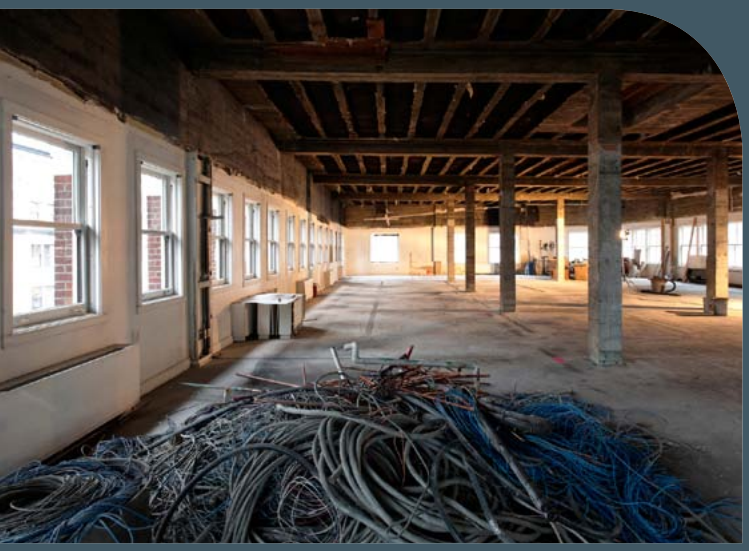
C. RESEARCH NEEDS

The following research needs were identified:

- Documenting the finance experience, including customer experience and acceptance, operational issues, loss ratios, and loan performance. Effective financing is critical to stimulate the market, and many different financing programs are currently operational, including on-bill financing or repayment and several different products offered by Fannie Mae. Detailing how to package financing from several different sources would also be beneficial.
- Developing business plans for three new entities: a center of excellence, a national fund for retrofits, and a special-purpose ESCO. The business plan for each would cover all aspects of how to make it operational, from functions to staffing to financing.
- Documenting the current experience with rating and disclosure laws. What are the implementation issues? Have they prompted an increase in retrofits, and do they affect housing affordability? The State of Minnesota and Bright Power are working on understanding some of these issues.
- Studying how to facilitate access to utility data. A synthesis of existing studies should be done first.

TOP THREE RESEARCH NEEDS

1. **Documenting the experience with all types of finance programs. The report should be written to assist the development or expansion of financing programs, and should clearly detail the finance industry's needs. The report should also detail ways to package different sources of capital, from utility incentives to tax credits to community development funds.**
2. **Developing business plans for the three new entities (center of excellence, special-purpose ESCO, and national fund).**
3. **Documenting the experience with ratings and disclosure programs: the types that are best and why, the implementation issues involved in different approaches, and their level of effectiveness in stimulating retrofit markets. One of the first tasks would be to determine what research is under way and whether coordination among the research projects would be beneficial.**



HEALTH CARE

6

HEALTH CARE

A. MARKET DYNAMICS

The following are key dynamics described by experts in attendance.

The health care subsector is among the most complex in the building sector given the many developments ongoing in the field. Different segments of the market, such as local clinics and hospitals, have very different needs and capabilities concerning retrofits. Doctors' offices are another part of the health care market, but these are probably more closely aligned with the commercial office space sector.

Management attention in hospitals and many clinics is focused on the implications of the Affordable Care Act, often known as Obamacare. Energy costs may be large in an absolute sense in many hospitals, but they are frequently a very small percentage of total costs so often do not receive much attention.

Clinics generally lack the technical expertise to evaluate technological options or financing, and often have a hard time obtaining credit. For large hospitals, it appears that stringent return-on-investment criteria limit access to internal capital for retrofits given other perceived priorities. Outside capital appears to be available, but demand for retrofits is low.

In the health care market and hospitals in particular, there is no downtime, so retrofits must be carefully scheduled and coordinated with ongoing operations. Compliance with health codes also presents unique challenges for those conducting retrofits in terms of air circulation and other issues. Building engineers in hospitals need training in the latest technologies, their potential benefits, and how to evaluate them.

Cheap natural gas is affecting the economics of both renewable energy and energy efficiency in hospitals. Plug loads are growing. The use of EPA's Portfolio Manager tool is among the highest in the hospital sector.

Various potential energy-related goals for the health sector are possible, including carbon neutrality. An individual hospital or building might pursue this goal; more comprehensively, the whole supply chain could be examined, including emissions from the plant where equipment was manufactured.

Many hospitals are part of the Healthy Hospital Initiative, which includes an energy efficiency goal as one of six areas of focus related to hospital "health." The initiative asks hospitals to commit to goals and actions, but its options for energy-use reduction are fairly modest, at 3, 5, or 10 percent; see healthierhospitals.org/. Many hospitals that have signed on to this initiative have achieved significantly more savings—often in the 20 percent range in case studies—than the level to which they committed.

B. PROMISING PROGRAM AND POLICY APPROACHES

The following content includes current and needed programs and policies as described by experts in attendance.

The Healthy Hospital Initiative is achieving results. Its modest energy efficiency goals could lead to cream skimming and undertaking only fast-payback retrofits rather than going deep, though, so those goals might be worthy of reexamination.

A carbon-neutral goal for health care, including a baseline for carbon in the health care sector, should be established. The whole supply chain should be examined, as was apparently done in the U.K., revealing insights on transportation

planning and other issues related to use of the health care system. Once the baseline is established, specific goals and the business case for energy efficiency retrofits should be made.

A case for energy efficiency that could be presented to executive management should be prepared. The benefits of energy efficiency beyond reduction in energy costs, both to the individual hospital or clinic and to the broader community, need to be convincingly documented. They would include health benefits to the community as well as to staff and patients, the potential for increased revenues through increased patient attraction because of an enhanced image, and lower health insurance premiums because of cleaner air.

Preparing a broad business case for how energy efficiency affects health is an excellent vehicle to get the CEOs of hospitals engaged in the community to promote energy efficiency. Establishing the health linkage to energy efficiency is essential to persuade them to undertake this role.

For clinics, the following approaches are a high priority: tie payments in reimbursement contracts for clinics to the energy efficiency of the building; develop special-purpose ESCOs to serve clinics that provide technical assistance and financing; and prepare a how-to guide on packaging different financing sources, such as community redevelopment funds and utility incentives.

Information needs to get out to clinics and hospitals. Knowledge communities could be sponsored on all aspects of retrofits, from technologies to delivery to performance to financing. Clinics should crowdsource ideas on these subjects. Case studies on both new and existing technologies, including how to implement and finance them, could be prepared by an organization such as the Center for Health Design.

Clinics that have had difficulties in accessing financing could work with a program that uses foundation PRIs to supplement technical assistance. It is important to establish partnerships for clinics if they are expected to implement a retrofit program.

A purchasing co-op could be formed to encourage use of efficient equipment and help clinics and hospitals deal with their growing plug loads.

A technical roadmap for doing "deep" retrofits could be prepared. The roadmap would discuss technologies, how to implement them without interfering with ongoing operations, and financing.

TOP THREE PROGRAM AND POLICY APPROACHES

1. **Funding the Healthy Hospital Initiative discussed above. Because it is operational, it can deliver immediate results if its reach is expanded.**
2. **For clinics assisting in the formation of a special-purpose, mission-driven ESCO, developing case studies, and fostering knowledge communities and crowdsourced ideas. Foundations could fund the preparation of a business plan for the mission-driven ESCO and/or provide some source of capital to galvanize the private capital market. The capital could be PRIs for a loan loss reserve or other uses, but it would be guided by the business plan developed.**
3. **Establishing a carbon baseline for health care throughout the whole supply chain, as was done in the U.K. This could be a potentially significant driver of retrofit demand. Related activities include establishing quantified goals for carbon reduction, documenting the business case for energy efficiency, and quantifying retrofits' other non-energy benefits, with an emphasis on those affecting health.**

C. RESEARCH NEEDS

The following research needs were identified for the health care sector:

- Expanding the tools for making the business case in the health care sector, and working with the developers of these tools to make sure they include non-energy benefits and health in particular. Existing resources include a Harvard tool that looks at life-cycle costs.
- Determining the plug load in both hospitals and clinics, and then assessing the possibility of an ENERGY STAR rating for some of the major energy-consuming equipment.
- Examining the technical assistance and financing needs and options for clinics, including NYCEEC and others. If warranted, a business plan could be prepared for a special mission-driven ESCO for clinics.
- Defining the boundaries of the baseline study of carbon in the health care sector. Existing tools and research should be assessed. The final report should be written to be useful to the "C" suite in the health care sector and financial community.

TOP THREE RESEARCH NEEDS

1. **Preparing the business case for energy efficiency. First steps are determining how it should be written to influence executives and obtaining the needed information to make a strong argument. Quantifying energy efficiency's non-energy benefits, with an emphasis on health, is critical. Tools that look at the life-cycle impact of energy efficiency should be expanded to include relevant non-energy benefits. Plug loads should be carefully examined. Case studies using these new metrics should be developed.**
2. **Documenting the financing and technical assistance options for clinics. Existing organizations such as NYCEEC and the Chicago Infrastructure Bank should be interviewed to gain an understanding of their current capabilities to serve clinics and how they could be improved. If research concludes that a special-purpose ESCO is needed, a business plan should be prepared.**
3. **Developing and conducting a baseline study of carbon emissions from the health care sector. The study should contain the information and conclusions needed for executives to take action.**

SYNERGIES AND COMMON THEMES

7

SYNERGIES AND COMMON THEMES

A. SYNERGIES

Each expert roundtable focused on one specific subsector of the building market. The experts were also asked to consider synergies—programs or policies that would benefit many of the subsectors.

Benchmarking and disclosure are among the strongest demand drivers and could be done for all sectors. Crossing sectors would also benefit this type of effort by creating efficiencies in training contractors and administrative staff. Contractors could be trained to rate different types of buildings as part of a comprehensive effort.

Having utilities actively engaged in the market is critical to every subsector. Public service commissions' adoption of improved utility cost-effectiveness tests that reflect all non-energy benefits from retrofits would likely increase utility provided incentives for retrofits. Utilities' on-bill financing and repayment programs are a ripe opportunity for program expansion in several subsectors. Access to utility data is a problem in some states, and easing access to data would improve energy efficiency programs and financial services, and decrease burdens on owners to disclose energy usage.

Improvements to streamline program mechanisms are critical to every sector. Many current program designs are too complicated and operations take much too long, which diminish demand from building owners, who are put off by lengthy and unclear projects or processes.

Programs with a geographic focus, such as a city, usually but not always serve more than one subsector. Publicity and momentum can be improved by having programs cross-cut sectors. Additionally, if multiple interventions (e.g., programs to drive demand as well as to provide financing) are needed for the market to be successful, it is easier to package these in a geographical location to have positive impacts.

Green-energy leases, which are intended to harmonize the financial interests of owners and tenants, while not yet widely utilized, have the potential to be implemented in many sectors. They are appropriate for commercial office and commercial retail space as well as multifamily units. Programs to drive demand for them are needed.

PACE programs are currently viable for both the commercial office and commercial retail subsectors. PACE programs can expand back into the residential sector if issues with Fannie Mae and Freddie Mac can be resolved.

The need for training, certification, and quality assurance of contractors cuts across all sectors. Programs addressing this could significantly increase demand for retrofits, as they would have minimized typical owner concerns about quality construction.

The very small retail, or "mom-and-pop shop," commercial subsector is similar to small multifamily and single family residential sectors. These owners or tenants often have little technical expertise and difficulty obtaining financing for projects. In rental properties there are split incentives between landlord and tenants inherent in most leases. It's important to have awareness that programs designed for one of these subsectors might be applicable to the others.

Crossing all sectors, the experts determined a need for real estate agents, appraisers, and finance institutions to be knowledgeable about retrofits and to understand their scope and impact.

B. COMMON THEMES

Several themes emerged from many of the roundtables. Some related to policy and program delivery, while others focused on the very processes of the roundtables and lessons for philanthropy.

The building market in most subsectors is still distressed in many parts of the country. This can be an obstacle to doing retrofits, but can also be an opportunity if the right program designs are coupled with an ability to document the non-energy benefits of retrofits. In addition, if retrofits can be shown to increase property values in depressed areas, it may become appealing to undertake a retrofit as part of refinancing.

A 20 percent reduction in energy use is readily achievable with the right program designs. "Deep" energy savings may require a much larger percentage, but panelists agreed that—in most buildings across all sectors—achieving a 20 percent reduction is not difficult. As noted earlier, the philanthropies defined a "deep energy retrofit" as a systematic approach that considers both building operations and a comprehensive list of technologies, including the building envelope, and agreed that it should be considered periodically over time and not as a one-time event.

A compelling need for mechanisms to drive demand for efficiency and retrofits exists in every sector. Benchmarking, ratings, and competitions are some examples of demand-driving mechanisms. Select cities are taking the lead in disclosure and ratings. Panelists generally agreed that the term "retrofit" is a poor word choice for marketing and does not incite demand.

Understanding, reliably quantifying, and documenting the non-energy benefits of retrofits are important elements in stimulating demand. The asset value of the building is the key non-energy impact from retrofits. Other non-energy benefits mentioned included health, job creation, productivity, and tenant retention.

Simplicity, packaging, and speed in program approaches are needed. Within subsectors, there will be differences in marketing, delivery approaches, and other elements. Yet all programs need to be simple; technical assistance needs to be packaged with financing more often; and the process cannot require too much of an owner's time. The "one-stop shop" approach has appeal in many sectors.

Utilities could have a central role in advancing the retrofit market. First, public service commissions could employ cost-effectiveness tests that recognize all the non-energy benefits from utilities' energy efficiency programs and provide appropriate incentives for utilities to promote efficiency to realize both the energy and non-energy benefits. Second, programs such as on-bill financing and repayment to help finance retrofits look very promising for many sectors. Finally, access to data needs to be eased for individual customers as well as to enable analysis for social and marketing purposes.

In many of the subsectors, significant energy savings can be realized by adjusting building operations. Given the large opportunity for long-term savings, proper building maintenance and operation does not receive sufficient attention in most program designs. Better training of building operators, as well as contractors and retrofit deliverers, is needed. The increasing importance of control technologies may heighten the need for better training so the technologies are used most effectively.

The need for financing is a common theme, although in some sectors capital is available but demand is not. The size of the individual retrofit project also affects what types of institutions or financing mechanisms are available. Approaches to financing range from developing business plans for special-purpose or mission-driven ESCOs for select market segments to documenting and simplifying the processes for packaging the different available capital sources. Foundations can play a critical role in using PRIs creatively to attract private capital, and use their capital for a variety of other purposes, from loan loss reserves to credit enhancements. Foundations should not attempt to do this on a project-by-project or "one-off" basis; their capital should be part of a portfolio available for retrofits to minimize risk and be more effective in the market.

Philanthropy can exercise leadership to encourage retrofits in other ways besides playing a critical role in financing. Board members can exert peer-to-peer pressure on other community leaders to conduct retrofits, for example, and foundations can examine their real estate investments and ask managers about their properties' energy efficiency.

Preparing case studies with actionable information for different target audiences is a part of almost every approach considered promising. Analysis should be conducted to determine what each stakeholder requires to consider information actionable—that is, information he or she can rely on to justify a decision. Getting the needed information may be challenging, and careful consideration must be given, sector by sector, on how best to secure it.

The challenge of taking the retrofit market to scale is a large one, so philanthropy should go "deep" rather than "wide," meaning that philanthropic dollars should be focused and not spread too thinly on too many things.

Given the scope of the challenge, philanthropic collaboration is beneficial—both among foundations and with the private sector and government agencies. To collaborate with the private sector and government agencies, philanthropy must better explain the levers and types of activities that it can undertake. Many in the private sector, some in government, and even some in the nonprofit sector are not familiar with ongoing philanthropic programs and are unaware of the type and scope of activities that foundations can undertake.

Finally, the experts who developed these recommendations said they participated because it was impressive to see a large group of foundations collaborating and they realized that the intended outcome was an "action outcome"—a guide for philanthropic programs. They also noted that a small roundtable is much more conducive to a productive meeting than a large conference.

NEXT STEPS

8

NEXT STEPS

AS NOTED PREVIOUSLY, this group of six philanthropies has not formally endorsed the findings or recommendations of the roundtables. They are presented here to help inform and spur the thinking of the wider community interested in these issues, as they have for the foundations that sponsored this effort.

In the fall of 2012, the foundations will evaluate the recommendations with a wider group and seek to identify roles that philanthropy can play to help build the market, identify leaders who can take an active role in advancing promising approaches, and identify good locations for pilots. The foundations are considering the recommendations from the roundtables as they develop their individual action plans as well as continuing to explore possibilities for collaborating on promising approaches, research questions, and common themes.

SUPPORT

THIS REPORT WAS COMPLETED WITH SUPPORT FROM:

THE DORIS DUKE CHARITABLE FOUNDATION

THE ENERGY FOUNDATION

THE KRESGE FOUNDATION

LIVING CITIES

JOHN D. AND CATHERINE T. MACARTHUR FOUNDATION

THE ROCKEFELLER FOUNDATION

9

EXPERT ROUNDTABLE MEMBERS

COMMERCIAL OFFICE EXPERT ROUNDTABLE

LAURIE ACTMAN
Deputy Director
Energy Efficient Building Hub

JAKE BAKER
Assistant Vice President, Lead Analyst, Energy Efficiency Finance
Deutsche Bank

ROBERT BEST
Executive Vice President
Jones Lang LaSalle

UWE BRANDES
Senior Vice President
Urban Land Institute

ANDREW BURR
Director, Building Energy Performance Policy
Institute for Market Transformation

BEAU ENGMAN
Vice President, Commercial Energy Solutions
Johnson Controls

GREG HALE
Senior Financial Policy Specialist
Natural Resources Defense Council

SUSAN LEEDS
Chief Executive Officer
New York City Energy Efficiency Corporation

VICTOR OLGYAY
Principal
Rocky Mountain Institute

DAN SELIGMAN
Senior Advisor
Energy Future Coalition

JANET STREFF
Manager
State of Minnesota Energy Office

COMMERCIAL RETAIL EXPERT ROUNDTABLE

MATTHEW BROWN
Principal
Harcourt, Brown & Carey

DOUG GATLIN
Vice President, LEED and Product Management
U.S. Green Building Council

SIVA GUNDA
Project Manager
Energy Efficiency Center, UC Davis

DAVID HEWITT
Executive Director
New Buildings Institute

ANNE HOSKINS
Vice President, Federal Affairs and Policy
PSEG

CHARLES LEITNER
Chairman
ULI Greenprint Center for Building Performance

JOYCE MIHALIK
Vice President, Energy Services
Forest City

SUSAN ROCHFORD
Vice President, Energy Efficiency, Sustainability and Public Policy
Legrand, NA

ADAM SIEGEL
Vice President, Sustainability and Retail Operations
Retail Industry Leaders Association

JANET STREFF
Manager
State of Minnesota Energy Office

SINGLE FAMILY RESIDENTIAL EXPERT ROUNDTABLE

ANNE EVENS
Chief Executive Officer
CNT Energy

ROBIN LEBARON
Managing Director
National Home Performance Council

EMMAIA GELMAN
Senior Researcher
Laborers International Union of North America

BRIAN HENDERSON
Southeast Regional Coordinator
National Association of State Energy Offices

PETER KRASJA
Chairman and CEO
AFC First Financial Corp.

DAVID LEE
Director, Residential Building Programs
U.S. Department of Energy

GEORGE MALEK
Energy Efficiency Portfolio Manager
Commonwealth Edison

DEREK SMITH
Chief Executive Officer
Clean Energy Works Oregon

LAURA STUKEL
Realtor, NAR Green and EcoBroker certified

DAVID WEITZ
Director, Applied Building Science
Conservation Services Group

MULTIFAMILY EXPERT ROUNDTABLE

DAVID ABROMOWITZ
Director, Real Estate Group
Goulston and Storrs

TOBY AST
Manager, Energy Initiatives
Preservation of Affordable Housing

DOUG BIBBY
President
National Multi Housing Council

ANNE EVENS
Chief Executive Officer
CNT Energy

BRIAN HENDERSON
Southeast Regional Coordinator
National Association of State Energy Offices

SCOTT JOHNSTONE
President
Vermont Energy Investment Corporation

GEORGE MALEK
Energy Efficiency Portfolio Manager
Commonwealth Edison

TRISHA MILLER
Senior Advisor
Office of Sustainable Housing and Communities
HUD

CHRISSA PAGITSAS
Green Initiative Program Manager, Multifamily Risk
Fannie Mae

JEFFREY PERLMAN
President
Bright Power Inc.

RICK SAMSON
President
Stewards of Affordable Housing for the Future
Energy

LAURENCE SCARPA
Principal
Brooks & Scarpa

TED TOON
Associate Deputy Assistant Secretary
Office of Affordable Housing Preservation, HUD

HEALTH CARE EXPERT ROUNDTABLE

JERRY ABRAHAMS
Partner and Chief Investment Officer
Captona Partners

MICHAEL BROWN
Director
CitiGroup

HEATHER BURPEE
Research Assistant Professor
University of Washington

GARY COHEN
President
Health Care Without Harm

RAMÉ HEMSTREET
Vice President, Operations and Chief Energy Officer
Kaiser Permanente

BRIAN HENDERSON
Southeast Regional Coordinator
National Association of State Energy Offices

CLARK REED
National Manager, Marketing, Energy Star Buildings
U.S. EPA

STEVE ROSENSTOCK
Senior Manager, Energy Solutions
Edison Electric Institute

RICK SMITH
Area General Manager
Johnson Controls

GAIL VITTORI
Co-Director
Center for Maximum Potential Building Systems

GERVEAN WILLIAMS
Director of Financial and Operations Management
National Association of Community Health Centers