EXPLORING THE RECOMMENDATIONS OF THE BRIM EXPERT ROUNDTABLES ON COMMERCIAL OFFICE AND RETAIL BUILDINGS

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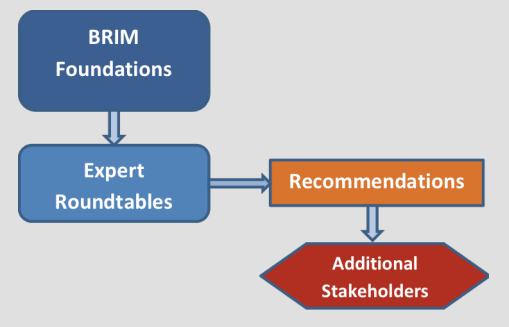
EXECUTIVE SUMMARY

The goals of the Building Retrofit Industry and Market (BRIM) working group of foundations – the Doris Duke Charitable Foundation, Energy Foundation, Kresge Foundation, Living Cities, MacArthur Foundation, and Rockefeller Foundation – are to identify and fund initiatives that stimulate the building energy retrofit market to "go to scale" with "deep" retrofits. In pursuit of these goals, the foundations held roundtables with experts representing a range of stakeholders relevant to targeted property markets, including commercial office and commercial retail. These roundtables generated recommendations on the most promising approaches and top research needs for each property market. (Several "common themes" emerged from the range of roundtables as well, touching on policy, program delivery, and lessons for philanthropy.) The BRIM foundations then sought to explore in greater depth the recommendations raised by the roundtables, gauging the reactions of additional stakeholders and seeing if other suggestions arose.



The foundations asked David Gardiner & Associates (DGA) to conduct this additional stakeholder review. DGA interviewed a wide range of stakeholders in the office and retail markets, including individuals whose companies operate properties (ranging from large portfolios to a single property), directors of industry associations and government energy efficiency programs, and pension fund asset managers (*see Purpose & Process and Appendix A*). DGA solicited opinions about the top three approaches (and, to a lesser extent, research needs) identified by the roundtables, other top approaches for foundations to pursue, and the most promising geographies and organizations on which to focus.

Key Findings from the Interviews

The Context of the Marketplace

Interviewees conveyed the impression that commercial office and retail markets are:

- Achieving some retrofit successes, especially in larger Class A properties.
- Awash in information, programs, and tools, to the point that people are getting lost amidst the clutter and noise, unaware of existing resources geared towards them and unable – whether due to lack of time, knowledge, trust, or motivation – to sort out the good information from the bad.
- Very large, fractured, and diffuse, with the interviews highlighting the wide diversity of stakeholder opinion about all of the foundations' questions and illuminating the absence of any consensus on the critical approaches and needs for spurring deep energy efficiency retrofits at scale.
- Generally lacking a sense of the financial benefits and minimal risks of energy efficiency investments, as well as a sense of environmental urgency about the need to retrofit buildings at the scale and pace that addressing climate change would require.

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This market context presents critical strategic issues for the foundations and suggests that any efforts to scale up and go deeper on building retrofits will require a sustained and extremely well-coordinated effort.

This critical need for philanthropic collaboration was one of the "common themes" identified by roundtable participants as well. Indeed, much of the interviewees' feedback ultimately related to several of the common themes from the roundtables, whether thoughts on operational savings, the need for finance, or how to drive retrofit demand.

Interviewees' Perspectives on the Top Three Approaches from the Roundtables

With respect to the office roundtable's top three approaches, interviewee input generally reflected the following:

- There was considerably less support for the idea of funding the NYC Energy Efficiency Corporation, which is trying new financing structures for funding retrofits, than for the other two "top approaches" from the roundtable (pilot projects and foundation leadership). Several interviewees suggested that financing and access to capital are not major barriers to more retrofits (though others indicated that portions of the market still have capital needs), and several also expressed concern about focusing investment on New York City, which is seen as not being representative of most real estate markets.
- Interviewees generally supported the idea of pilot projects and offered several ideas about what the projects and the accompanying case studies should contain (e.g., a return-on-investment analysis, concise presentation of results) and focus on (e.g., low- or no-cost technologies, whether targeting communities such as brokers makes sense), though they cautioned foundations to be careful not to duplicate the wide range of pilot projects and related initiatives already out there. In addition, a couple of interviewees warned that every building and project always views itself as unique and that the era of just doing pilot projects is over.
- Interviewees generally supported the idea of foundations showing their own leadership, apart from grant-making, noting that it is important for foundations to "walk the talk", though many cautioned that such efforts – apart perhaps from program-related investments in a retrofit fund – are unlikely to have much impact on achieving scale.

With respect to the retail roundtable's top three approaches, interviewee input generally reflected the following:

- Interviewees generally liked the "top three" approaches, although the idea of supporting development of incentives and better data (including mandatory benchmarking) was somewhat less popular than the suggestions that foundations fund multi-stakeholder partnerships or support a "Main Street" challenge and one-stop shop for retrofit needs.
- A few interviewees expressed strong support for incentives and benchmarking, though a couple of interviewees questioned the effectiveness of foundation spending in these areas, while others broadly opposed both incentives (as expensive and prone to limiting action until the next incentive or rebate) and the idea of making benchmarking mandatory.

- Several interviewees supported the idea of multi-stakeholder engagement and education, such as bringing tenants and owners together to address green leasing and mis-aligned incentives; interviewees also seemed to like the idea of sending problem-solving non-profit fellows on site to engage with C-suite executives.
- Several interviewees liked the idea of the Main Street challenge and/or the one-stop shops for small businesses as a good way to enable broader efficiency education and action, though a few interviewees noted the challenges involved in getting the attention of small retailers for whom energy is not a priority, finding ways to engage small retailers cost-effectively, and engaging retailers other than ones likely to do upgrades anyway.

Interviewees offered very limited feedback about research needs in the office and retail sub-sectors. The interviewees who expressed opinions generally indicated that case studies can sometimes be important, but they cautioned that many case studies and other information already exist, case studies are often too long or misleading, and, as noted earlier, every building and project views itself as unique. Interviewees also generally felt a playbook on integrating capital pools would be helpful if it was a living document and that some research on retrofit benefits might be of value.

Other Input from Interviewees

In addition to feedback on the top three approaches put forth by the roundtables, interviewees offered a wide range of input about other top approaches to pursue and the organizations and geographies on which to focus:

- The core barriers identified by interviewees in both sub-sectors seemed to be 1) a lack of understanding by many in the sector about why energy efficiency is strategically and financially important to pursue (and how best to pursue it), and 2) people feeling like the return on investment is inadequate, especially to justify large and deep upgrades. Many interviewees thus stressed the need for a range of educational efforts targeting building operators / engineers, tenants, owners, and others. A few interviewees recommended supporting: incentives and rebates; policies, codes, or disclosure mandates; recognition programs; efforts to conglomerate key actors; technology fixes or promotion; and a range of other ideas.
- A very strong message emerged from the interviews about the relatively cheap operational changes that could accomplish a lot of energy savings. It is worth noting, however, that operational savings do not fit well within the "retrofit" framing, suggesting the potential need for a different way to frame and present this opportunity.
- As for geographic focus, interviewees generally recommended focusing on the first-tier cities (e.g., New York, Chicago, Seattle, San Francisco), many of which have building efficiency disclosure mandates and/or high energy prices. Not all interviewees supported such a focus, with a few instead concentrating on less high-profile cities as being relatively overlooked and necessary for achieving scale. (Interestingly, perhaps because the question was not explicitly framed in these terms, no interviewees flagged as a factor how coal-based the electricity supply is in a region, which would affect the greenhouse gas reductions achieved via efficiency upgrades.)

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- With respect to potential leaders or partners, the main organization mentioned by interviewees in the office context was the Building Owners and Managers Association (BOMA), though interviewees also suggested a great many other organizations, including the National Association of Real Estate Investment Trusts (NAREIT) and the Institute of Real Estate Management (IREM). There was much less consensus with respect to the retail sub-sector, with Energy Star being the only organization mentioned by more than one interviewee.

Discussion & Analysis

Interviewees frequently commented on the vast amount of efficiency information and programs already in the market and the difficulties encountered in trying to sort through all the clutter and noise. The market is awash in information, and yet many owners, developers, tenants, engineers, and other actors know very little about the potential energy savings and financial benefits from efficiency upgrades, are wary of taking any risks in making a decision to advance such upgrades, and do not understand how to choose new efficiency technologies or even how best to operate the technologies (e.g., energy management systems) already in place. Interviewees exhibited varying levels of understanding not only about the efficiency opportunities available, but also about the range of already existing programs (on-going and past) designed to address some of the very "needs" and "approaches" they identified.

Based on interviewees' recommendations and the DGA team's own expertise, the DGA team has identified two general categories of efforts that philanthropies could – and should – pursue. The first category encompasses useful things that could be building blocks in helping to move the markets a bit further along in achieving energy efficiency upgrades. Many of the interviewees' recommendations fall into this first category. There are also a few ideas that fall into a second category of efforts, namely ones that can truly leverage significant improvements in the scale and/or depth of efficiency retrofits befitting the urgency of the climate challenge many of the foundations seek to address.

Efforts that are Useful

- *Compendiums of Programs & Case Studies* – Interviewee suggestions have been presented in this report in relatively unfiltered form. Several of the interviewees' suggestions have already been tried. Before the foundations jump into funding, they should first make sure they have a good inventory of the programs that are already out there (existing and past) and the savings (and persistence of savings) achieved by those programs, to see if there are existing efforts to fund, build on, or revive. Such an effort would be a very useful underpinning for further progress. Foundation support for creating an online searchable database of existing case studies that allows customization of reports in formats familiar to various target audiences could also be useful.
- *Education / Information (e.g., on Operational Savings)* – Despite a strong message from interviewees about being overwhelmed with information, the over-riding message from interviewees was nevertheless a need for greater education, information, and tools about why energy efficiency is strategically and financially important to pursue (and how best to pursue it). Such an effort must be designed to cut through the noise, clutter, and other barriers preventing uptake of such information now. "More education" is often the

answer people give to questions such as the ones to which the foundations sought answers, and it is indeed a necessary underlying base for further progress. Education, information, and tools should undoubtedly be *part* of foundations' efforts to advance efficiency retrofits. For instance, foundation support for education and training on operational changes that could help make progress towards "deeper" energy savings could be worthwhile, though again, foundations should first look to existing and past programs to figure out what has been successful.

Efforts that Could Leverage Improvements in Scale and/or Depth

- *Policies, standards, & incentives/rebates* – Policies, standards, and incentives/rebates can be critical levers for creating wide-scale change, as they tend to spur changes in many buildings with one fell swoop. Interviewees suggested a range of policy and standard changes that could be important, ranging from disclosure mandates to changing the Illuminating Engineering Society lighting standards. Others raised the importance of incentives and rebates for spurring action on retrofits. Some interviewees opposed these approaches, but there are few other tools that can have similarly sweeping impacts.
- *On-site fellows* – In terms of achieving "deeper" retrofits (and, to a lesser degree, achieving scale), it is possible that the idea of sending outside efficiency fellows to engage on-site with companies and executives could make a meaningful difference. Such a program could help some buildings realize much deeper energy savings. It could also be expanded to cover a much wider range of building classes, smaller retailers, and others that have been relatively untouched by existing programs; it could, for example, be anchored to mayors offices or other local sponsors. Environmental Defense Fund's Climate Corps does this already to a degree, with some success, although they have had challenges engaging private sector participants and scaling up their successes. However, such an expanded approach may not be cost-effective or feasible, so foundations need to first evaluate that, as well as the potential for leverage and the need for such programs.
- *Conglomerating key actors to exert pressure* – Organizing a group of key market actors (e.g., tenants or investors) to exert persistent, persuasive, and powerful market and/or political pressure for widespread change could be a strong lever for action on efficiency retrofits. A key question to consider is whether an effort focused on those market actors that are easily organized would reach any actors that are not already engaged. Also, again, foundations should first look to existing and past programs to figure out what has been successful. Our initial assessment is that mobilizing a limited number of the largest tenants helped to drive significant efficiency upgrades in much of the Class A office space. It is hard to tell if further mobilization will drive more in that sector, but it would likely be helpful in Classes B and C, where less has been done, if key actor groups can be identified.
- *Focus on achieving scale with lighting and other low- and no-cost upgrades.* In a typical building, lighting upgrades achieve twice the efficiency gains of the next equipment upgrade. These improvements are easier to understand and implement than other improvements and have rapid paybacks. It therefore may make sense to focus on driving lighting upgrades across all commercial building classes (e.g., revisiting EPA's Green Lights program), rather than seeking fuller upgrades. At a minimum, it would be useful to compare the savings that might be achieved by driving lighting upgrades in Classes B

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and C (i.e., scale) to the savings from driving more comprehensive upgrades in Class A (i.e., depth). In addition, driving adoption of other low- and no-cost technologies could similarly help achieve greater scale.

- *New building ownership efficiency ethic*- Foundations could support a focused effort to create a widespread ethic of efficiency and retrofits among building owners and all connected with the industry. The idea would be to try to replicate the ethic that has started to grow stronger concerning recycling – i.e., to make it something that people just feel they ought to do as a matter of course. Such an effort might include reviewing existing retrofit challenges to the industry from the President or other elected officials and both simplifying and expanding them for larger impact, broader education about the benefits of building retrofits, or public recognition or embarrassment for those who do the right or wrong thing. There is considerable research from the academic community about how society establishes norms, as well as social and behavioral work being done by groups such as the Garrison Institute, which the foundations may wish to analyze.
- *Encouraging collaboration, coordination, and expanded communications.* The interviews suggest that the many private and government organizations working on building efficiency are not "breaking through the noise". Foundations are funding many non-profit groups working on discrete aspects of the issue, but it is not clear that these groups coordinate with each other or that their work is part of an over-arching strategy. There is also a vast array of building labels, with new labels potentially emerging from a range of initiatives. To break through the clutter that is out there, the foundations may wish to insist on stepped up collaboration and coordination among even just the non-profit groups working in this area. This could be accompanied by a significant communications effort designed to drive even more action by building owners, tenants, investors, policy makers, and others. It may also be appropriate to include other organizations from the private and public sectors, such as Energy Star.

All of the measures above could support comprehensive and strategic approaches to energy efficiency retrofits that include packages of technology and operational practice measures. Driving broader adoption of lighting and other low- and no-cost measures are the only exception, as they represent relatively easy ways to achieve substantial energy savings in a broader range of buildings.

With respect to geography, foundations may want to consider a portfolio approach, working in places where they can aim for further depth (e.g., Class A buildings in major cities), places where they can aim for greater scale (e.g., secondary markets and/or Class B and C buildings), and places where they can aim for serious greenhouse gas reductions (e.g., major coal-using states). We are not recommending a specific focus on one building class or another, but rather that the foundation might take several approaches as part of a portfolio approach. Those that succeed can be expanded.

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PURPOSE AND PROCESS

During the summer of 2012, the BRIM working group held a roundtable with experts representing different stakeholders relevant to the commercial office sub-sector of the building market, as well as a roundtable with experts on the commercial retail sub-sector, including representatives from retrofit service companies or equipment providers, finance, building owners, utilities, federal and state officials, nonprofit organizations, and others. The purposes of the roundtables were to discuss what approaches were most promising to stimulate the building energy retrofit market to "go to scale" with "deep" retrofits and to identify for philanthropy (and, to a degree, others) priority action items. The expert roundtables issued recommendations of their top three approaches in each sub-sector, as well as the top three research needs to assist implementation of those approaches.[1]

The purpose of this current work is to further explore the recommendations made by the office and retail roundtables with an array of other stakeholders within the office and retail real estate fields (i.e., ones who did not participate in the roundtables), 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 philanthropy (and, to the extent appropriate or identified, other market participants) to bring the retrofit industry to scale with a goal of deep retrofits.

The DGA team identified a range of stakeholders in the office and retail sub-sectors, as well as those with expertise in both. Ultimately, the DGA team was able to conduct interviews with 33 of the individuals identified (*see Appendix A*), representing an array of experiences and perspectives, including individuals in firms that are lessees / tenants, owners / developers / operators (including REITs), property / facility managers, pension funds, service providers, and program administrators. Some of the firms are publicly traded, others private; some very large, others very small.

In many, if not most, of the interviews, the individual's available time was severely constrained, limiting the number of questions (and follow-up questions) that could be asked. Accordingly, not all questions to which the BRIM foundations sought answers could be asked or fully explored during the interviews. Nevertheless, the DGA team procured valuable feedback from its interviews that should help the foundations triangulate on their preferred approaches.

[1] The recommendations of all five expert panels are detailed in "Report on Expert Recommendations to Increase the Pace and Scope of the Building Market", October 2012, by James L. Wolf.

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PHILANTHROPY ROLE & BROADER CONTEXT

We have been through many years of pilots, educational initiatives, and other programs designed to test and promote energy efficiency retrofits. Significant progress has been made. Many Class A office buildings and a few leading retailers in top-tier cities have made and continue making serious investments in improving energy performance (particularly with respect to lighting), driven by market pressures and, to an extent, the range of past and current programs, tools, partnerships, and other initiatives. LEDs for lighting are starting to come to prominence in these markets. These actors can still go "deeper" on retrofits, while getting to "scale" could require bringing in (perhaps starting with lighting) actors in other geographies and building classes.

Yet many barriers remain to scaling up and deepening energy efficiency progress in commercial office and retail buildings. The markets are very diffuse, with millions of possible actors and diverse building types located in geographies with different climates and energy prices. Every building and every project views itself as unique. The market is awash in information, and yet many market actors know very little about the potential energy savings and financial benefits from efficiency upgrades, are wary of taking any risks in making a decision to advance such upgrades, and do not understand how to choose new efficiency technologies or even how best to operate the technologies already in place. Some building owners lack capital to make upgrades, while others have capital but question the return on investment. Owners and tenants often have mis-aligned (or no) incentives to invest in energy efficiency retrofits, often depending on who is paying the electricity bill. Given the recent rough economy and real estate market, some owners have been reluctant to place demands on tenants who are not pressing efficiency issues during leasing discussions, while some tenants are finding it hard to convince owners to invest in efficiency retrofits from which owners believe they will see little benefit. Small retailers have neither the time nor the ability to deal with everything involved in efficiency upgrades. And many actors in the markets, lost amidst the sea of information or too busy with other things to care, do not know what the good programs, services, and tools are that are geared toward them.

Given the lengthy history of energy efficiency programs and the very urgent need to quickly ramp up reductions in greenhouse gas emissions, foundations should be seeking ways to move beyond pilot projects, education on financial value to a passive population, etc. There are enough successes, failures, lessons learned, and continued enthusiasm to move forward in a more comprehensive and urgent way. However, the interviewees offered no consensus on what a clear, game-changing path forward might be. Within this context, there are positive initial steps that philanthropy can pursue, recognizing that these fall short of the high-leverage initiatives needed. Among other things, foundations can:

- Support initiatives to consolidate, organize, and make easily accessible the range of resources already in existence.
- Support initiatives designed specifically to cut through the noise to reach key targeted audiences with clear, unbiased information and/or training.
- Support focused pilot projects for key technological *and* operational changes, with clear strategies for communicating the lessons learned to targeted audiences.
- Supporting efforts to identify and advance potential levers that can create widespread, deep, significant change, such as policy.

POTENTIAL APPROACHES: OFFICE

Comments on the Top Three Approaches from the Roundtable

The BRIM working group foundations convened an expert roundtable this summer to begin exploring ways to go to scale and go deep with energy efficiency retrofits in commercial office buildings. The roundtable came up with a list of the top three things foundations could do in this area:

- Conducting pilots in 5-7 specifically targeted cities, with development of marketing, disclosure, benchmarking, and finance tools, as well as detailed case studies.
- Supporting the very prominent existing efforts of the NYC Energy Efficiency Corporation, which is trying new financing structures for funding retrofits, and then preparing lessons learned and case studies so others can learn from NYCEEC.
- Showing leadership themselves, apart from just making grants, such as through program-related investments to galvanize a fund to support retrofit funding, focusing on their own real estate assets or ones they are invested in (e.g., stimulating advances in energy efficiency in the assets in which they are invested), or having Board members encourage other community leaders to take action to begin retrofits for their properties.

Interviewees generally supported the first and third ideas on pilots and foundation leadership, while there was considerably less support for the second idea on NYCEEC and financing. It is important to note that these "three" approaches are not always clear or cohesive; they are amalgamations of a range of ideas presented during the expert roundtables. It was therefore not always clear which aspects of the approach description interviewees were responding to when they said they liked or disliked an idea. Similarly, some interviewee feedback focused only on one aspect of an approach and so did not address every element or the idea in its entirety.

Conducting Pilots in Targeted Cities, With Associated Tools and Case Studies

Only two interviewees opposed the pilot project idea. All remaining interviewees in the office sub-sector that expressed an opinion were either in favor of the idea (often with specific ideas of what the pilots should be) or somewhere in between support and opposition.

- *Support* – Many interviewees favored the idea of conducting pilots, including some who thought it was the approach that would have greatest impact. Among the elements that individual interviewees suggested be included in the pilots were:
  - Some kind of return on investment analysis and average cost per kilowatt-hour;
  - Up-front design that enables measuring results not only from an energy standpoint but also from a human standpoint (i.e., do the people in the space feel better about it), that takes account of the need for the retrofit process to minimally disrupt the workplace, and that filters out what is an issue of technology versus what is an issue with the reliability of a particular manufacturer;
  - Project types that can make sense to, and develop an efficiency retrofit pathway for, different types of ownerships;
  - Coverage of Class A, B, and C buildings so the case studies could apply to any building;
  - Case studies that were short and tight (not tomes); and

- Carefully thought out marketing, communications, and dissemination strategies to get the information out to those who need it.

Interviewees also offered a range of specific ideas about what the focus of the pilots ought to be, including:

- Technology and practices that realize energy savings regardless of people and use, focused on the commercial high-rise multi-tenant environment (200,000 square feet or above);
- Surgical pilots that could shift the marketplace to adopt simple low- or no-cost technologies that are wildly underutilized (e.g., pilots focused on carbon dioxide sensors or fixing / optimizing outdoor air dampers) and that can get you at least halfway to 30% savings – and *not* massive projects that involve multi-week audits and a ton of bundled technologies (though another interviewee cautioned that doing low- and no-cost measures separate from an integrated strategy would leave the remaining measures with a much longer payback period);
- Projects that take similar buildings, sub-meter some and not others, and then gather some real data to see the differences;
- Testing ideas about whether it makes sense to target particular communities with educational efforts (e.g., targeting tenants and landlords on the financial benefits of energy efficiency, targeting the broker and interior architect communities about the benefits of energy efficiency so that when there is lease turnover, and tenants come in to look at the space with their brokers and architects, they ask about the energy performance of the space);
- The efficiency gains that result from training building operators on how to properly use their operating systems; and
- Creating an "actual functioning living lab office center" research institute that focuses on integration and interoperability, offering free office space to tenants with the caveat that the operations of the building are a laboratory for students to test energy efficiency ideas.

- *In-Between* – Several interviewees were not opposed to the idea of conducting more pilot projects but thought that there were serious limitations to the idea. These interviewees generally mentioned that there are a lot of pilot projects and related initiatives already out there and that a lot of the information already exists, so they suggested either pooling resources with other initiatives or ensuring that any foundation pilot projects do not duplicate what is already going on. A couple of these interviewees suggested the pilots *might* be useful if they looked at a very specific technology (e.g., LEDs), while another suggested a pilot might be useful if it looked very specifically at providing consulting services for efficiency at the intersection of permit application, review and conformance to local building energy efficiency codes. One interviewee warned that it is not always easy to spend free money, as the Energy Efficient Buildings (EEB) Hub is learning in trying to spend the money it has on pilot projects. Another warned that it can be very challenging to combine engineering knowledge and finance knowledge in a way that accurately measures and reports energy savings from the pilot to the various audiences involved. Another interviewee was skeptical that more pilots would get much press coverage outside of the local markets where the pilots took place. Finally, one interviewee offered the sage caution that while pilots and case studies are useful, building owners and operators feel that "our building is *always* different."

- *Oppose* – One interviewee flat-out opposed the pilot project idea, arguing that it would be difficult to accomplish much in 5-7 projects with funding only in the area of $10 million. Another asserted that "doing a pilot and a case study has been debunked; it just doesn't work anymore. Every building and project is unique in its own way."

Supporting the Existing Efforts of NYCEEC on New Financing Structures for Funding Retrofits

Not all interviewees were knowledgeable about NYCEEC, so to the extent those interviewees offered views on this approach, their responses centered more generally on a finance-centric, NYC-centric, and/or existing-versus-new-efforts approach. That being said, only a few interviewees expressed strong support for this approach. A few opposed the idea, and many fell somewhere in between.

- *Support* – Only a few interviewees favored the idea of supporting NYCEEC's efforts. One interviewee thought NYCEEC was a great model to support and suggested looking at the Boston initiative as well (which will largely involve smaller owners). Others thought the general idea was fine given the bureaucracy involved in funding today that deters people, but warned that any support for existing efforts should first involve an assessment of whether the organization is effective, has proper analytics, or is biased towards certain types of technologies. Another interviewee, who is very familiar with NYCEEC, suggested that foundations writing checks to support NYCEEC could be a very good idea, as a bridge source of capital while it works to develop private sources of capital (though foundation involvement in trying to design new NYCEEC products or programs would be less welcome).
- *In-Between* – Several interviewees thought that support for NYCEEC or for providing retrofit capital might be a good thing but should not be anywhere near the top of the list because, as one put it, "financing is not the big hang up – it's the feeling like the return on investment is not there." Another similarly stated that "I don't think the broad real estate market's barrier to energy efficiency is lack of access to capital. The question on any investment idea is 'what's the payback?'." Another interviewee explained that financing makes decisions easier when calculating ROI but does not get people to review, analyze, and approve retrofit projects in the first place. Other interviewees expressed mixed views about capital availability, generally stating that large institutions do not see access to capital as a roadblock while "many building owners" and "smaller organizations" have capital needs, though one interviewee suggested that utilities have reached out to many of those users. One interviewee asserted that the key is to "take the burden of the upfront capital away from the owner and put it on someone else"; the expense of financing might spur a company to use its own capital, but outside capital would enable faster progress on efficiency upgrades.

  Interviewees who generally supported exploring financing issues (whether at the top of their list or not) expressed concern about focusing investment on New York City. One argued that "anything that expands a NYC mandated program isn't a good thing, while a few other interviewees suggested that NYC "is really unusual and not representative of most cities in the U.S.", there is a group "that does not follow NY and distrusts it", and talking just about NYC "loses its applicability to the broader market." Another interviewee warned that "every group formed in Manhattan for real estate tends to be politically charged", which raises the risk of other interests trumping what the

foundations are trying to achieve. One of these interviewees suggested that investing in NYCEEC would be worthwhile mainly if the ownership groups funded by NYCEEC were willing to expand their NYC energy efficiency retrofit programs to all their building portfolios throughout the country.

- *Oppose* – A few interviewees did not support this approach, largely for the reasons already described by those who fell somewhere in-between. One interviewee asserted that a financing pilot project would not be a big motivator for the interviewee's company, which would just look to provide the capital itself to avoid the hassle of financing, and that financing efforts like NYCEEC's are a driver for only a modest portion of the industry. Others echoed that the financing can be provided in-house ("we have the money and can spend it if we see the validity of it"). One interviewee further explained that lenders are very resistant to changing their underwriting criteria and processes. Another interviewee suggested that NYCEEC does not need the help, as it will only affect New York ("no one outside New York will read it") and that the first step is "to get people to understand what we're talking about", whereas "the financing of all this stuff is relevant, but that's very much tomorrow and next year."

Showing Foundation Leadership Apart from Grant-Making

Interviewees generally supported the idea of foundations showing their own leadership outside of grant-making. However, it is important to note that the description of this "approach" in particular actually encompassed at least three distinct approaches (program-related investments to galvanize a fund to support retrofit funding, focusing on advancing energy efficiency in their own real estate assets or ones in which they are invested, and having Board members encourage other community leaders to take action to begin retrofits for their properties), so interviewees sometimes expressed support for only one of these, not all. That being said, no interviewees were entirely opposed to the idea; they all either supported the approach (or at least one aspect of it) or fell somewhere in-between support and opposition.

- *Support* – Several interviewees expressed relatively strong support for at least one of the ideas encompassed in this approach, with more than a few putting this approach at the top of their lists. One interviewee maintained that if foundations "are not using the same energy efficiency methods and technologies that they are pushing for, then it is hard to take them seriously. … I think they need to get their house in order before they go out and be missionaries to the world." Others similarly supported foundations having to "walk the talk", "having the ability to live with what they are funding", raising awareness among other community leaders, and advancing adoption of energy efficient practices and technologies by exposing designers, developers, and contractors to them while retrofitting foundation properties. Other interviewees expressed support only for particular ideas within this approach, including:
    - Program-related investments to galvanize a fund to support retrofit funding. One interviewee suggested that the fund idea should be at the top of the list, as actual provision of capital to do retrofit projects is great and makes retrofits more doable. Another liked the idea of a rolling fund "if attached to the pilot concept and not allowed to grow beyond a certain surgical focus", such as the small stuff that slips through the cracks but have a large impact (e.g., cleaning coils, replacing filters); beyond that, this interviewee felt that nothing

foundations did with their own properties or Board members would in any way "change the market." Another interviewee felt that "with billions in assets, were one to make a statement on investing based on sustainability objectives, that would have an impact" (whereas the foundations have fairly limited property holdings, and the impact of Board members depends on who they are and what they are willing to do). One interviewee suggested the foundations could do program-related investments that finance and provide initial capital for private sector organizations that are trying to make a business out of improving energy performance. Another suggested that a retrofit fund could be valuable, perhaps providing competitive grants to private owners willing to take a chance on particular technologies or strategies, with the grants turning into low-interest loans paid back with the savings if the technologies or strategies work.

  - Focusing on advancing energy efficiency in their own real estate assets or ones in which they are invested. One interviewee, for instance, indicated that a key motivator at many properties for change to be made is either ownership or specific tenant populations making requirements that something be done, so "if foundations have investments in real estate and set mandatory requirements, that is a big motivator for people to go back and look at what they are doing" with respect to efficiency; this interviewee further supported foundations implementing recommissioning or retrocommissioning on their own properties but thought it would be more effective to create an organization that goes out and does such assessments at no or minimum charge to help others understand the opportunities.
  - Having Board members engage with other community leaders. One interviewee, for instance, suggested that a foundation that has recruited and retained a Board that includes prominent influential people involved in real estate markets could very well use that influence in a very valuable way.

- *In-Between* – A small number of interviewees fell somewhere in-between support and opposition to this approach, though given the multi-faceted nature of this approach, the lines between supporting only one idea while opposing others, opposing one idea and expressing no opinion on the others, and in-between support for the overall approach are a bit hazy. One interviewee, for instance, suggested that foundations whose goal is energy reduction spending money to retrofit their own properties sounds "good but self-serving" and "won't inspire anyone else" without a good payback analysis and a strong business case. Another interviewee suggested the approach faced "a lot of barriers" but overall is not a bad idea – though what the barriers are and which aspects of the multi-faceted approach the interviewee was referring to remain unclear.
- *Oppose* – No interviewees squarely opposed this approach.

Other Approaches Raised by Interviewees

In addition to their views on the top three approaches raised during the roundtable, interviewees offered several other "top" approaches for foundations to consider in the office sub-sector. Many of these focused on the need to provide some sort of education, information, or tools to a

range of players in the market. Other suggestions included focuses on policy, incentives, recognition programs, and conglomerating key actors, as well as a range of other ideas.

Education / Information / Tools

The majority of interviewees focused on the importance of providing education, information, or tools to key actors in the market. This included:

- *Filtering vendor noise* – Three interviewees with expertise in the office sub-sector noted the need to provide information to enable people to sort through all the claims, products, and services offered by vendors. (One retail interviewee also focused on this problem.) One interviewee noted that there are a lot of firms selling "blue-sky products that sound good but do not achieve what they are supposed to" and providing "some debunking" would be valuable (though, as a caution, this interviewee also noted that most engineers do not trust the free support/analysis opportunities that are already out there, believing there must be a catch). Another interviewee similarly described how there "seems to be lots of information, services, and products available, but they are coming from people with an agenda to sell it, so maybe there is too much noise and not a clear enough message from an independent source" such as a foundation or organization with no product or service to sell; this interviewee suggested the big institutional players would value that kind of information. Along the same lines, a third interviewee stressed the need for "unbiased education that cuts through the strident voice of the marketplace trying to sell expensive equipment" such as a new $100,000 chiller that is much more profitable than but likely not as impactful as a $100 carbon dioxide sensor.
- *Providing skills training* – Three interviewees identified a need for improved skills training on energy efficiency. All of these interviewees focused squarely on building operators, noting that "most operators are not trained to use all the tools at their disposal" in their "extraordinarily sophisticated" building energy management systems, that buildings "have building control systems that are just amazing and are being used as time clocks", and that it would be worth exploring how to send building operators to get "specific guidance and instruction" on their operating systems: "if you can teach your operators how to properly use their systems, you will make huge leaps in efficiency." One of these interviewees further indicated that there is nowhere that engineers can take real courses in energy efficiency management, retrocommissioning, and other important usable topics and that perhaps foundations could pursue efforts to include these efficiency components in licensing tests (in jurisdictions where they are not already included).
- *Promoting tenant education* – Several interviewees noted the important role that foundations and non-profit organizations can play in improving energy efficiency education for tenants, who control a significant portion of the electricity consumption in an office building through the way they use their space. One suggested the need to create "Education on Electricity 101" to teach tenants that includes how electricity is made, how it gets to a building, how tenants consume it, what a meter is, how to read an electric bill, how can tenants deploy in their own spaces with minimal effort a range of basic technology and programs (e.g., competitions among divisions or floors), what the potential savings opportunities and payback periods are, what the incentives are, and some real case studies. Another interviewee suggested creating a white paper or other materials to circulate to tenants. A third suggested educating both tenants and landlords

on the financial benefits of energy efficiency. Others indicated a need to teach clients, brokers, and users of buildings the benefits of energy efficiency and smart practices (e.g., turning off lights, computers, printers, etc.) and to stress the potential marketing / PR benefits of efficiency upgrades.

- *Promoting general education for owners, developers, engineers, staff, and others* – In addition to all these specific educational / informational suggestions, many interviewees flagged the general need for energy efficiency education, including for engineers and field staff, senior management, big owners, small owners, corporate users that own their own real estate, large publicly traded REITs, electrical contractors, and brokers. Specific suggestions included:
    - Educating engineers that a system that is not broken may still need to be changed.
    - Educating developers, investors, and large and small owners about the technological and operational efficiency options they could employ in their buildings.
    - Creating an online tool in which building staff could enter their actual equipment, its age, and some utility information and produce potential scenarios for efficiency upgrade opportunities (operational and technology) and potential payback periods.
    - Articulating the business case for investment in sustainability, targeting senior and executive management among large investment owners, corporations, and REITs. The business case would describe both the tangible value creation of energy efficiency and the risk mitigating benefits of hedging against a "brown discount" in the growing number of markets where green assets are said to lease and sell at premiums. Such an effort should include good quantitative case studies and financials that demonstrate that making energy efficiency upgrades improves the bottom line – i.e., "a strong economic argument that they will make more money if they do it this way" – though only one interviewee explicitly indicated a need to provide data on the impact of retrofits on asset value. (One interviewee cautioned that publicly traded REITs are in some ways a challenging target because their investment return cycle is much quicker than most upgrades apart from lighting.)
    - Changing the construction process to improve communication between the various parties so people understand and integrate the technologies, processes, and costs involved in efficiency retrofits. For example, many electrical contractors will still calculate the labor costs for a project that is wired versus wireless at the same rate due to a lack of understanding. Part of this effort may involve stimulating development of better software that enables all parties to better figure out the technologies, processes, and costs involved in transforming a space.

Promoting Incentives / Rebates

Apart from the education focus, foundations could also promote the creation and use of rebates and tax incentives. One interviewee, emphasizing California roots, highlighted the vital role that

rebates play in advancing energy efficiency upgrades in office buildings: "Basically rebates are saying that energy efficiency is on sale, but it's temporary, so it motivates people to purchase while these rebates are available rather than saying 'I'll just buy them next year'." Another interviewee similarly suggested the need to mirror utility rebate programs by providing some kind of tax incentive program for demonstrating in a verifiable way that energy consumption was reduced by some percentage over some previous year's usage – in order to drive action on the huge range of no- and low-cost things that could be done to operate buildings more efficiently.

Another interviewee, however, noted that while tax credits (and, presumably, rebates) are a good thing, they are rarely large enough to spur major efficiency upgrades: "A tax credit is great, but it is not a reason to make the decision."

Promoting Policies / Codes / Disclosure Mandates

Four interviewees indicated a need for promotion of policies or codes. One suggested that "what would really move the needle" is to "invest in efforts to get code mandates", whether ASHRAE or forced energy disclosure. Another similarly suggested that a top approach should be to work with cities and states on policy initiatives like the New York City disclosure regulation. A third argued that foundations should use their dollars to advocate for "consistency in the program offerings" that support energy efficiency, noting the need for consistent regulation across the country, ideally with some sort of federal standard or guidance "that could be used as a bit of a stick." However, this interviewee also cautioned that while disclosure requirements can be good, "no one is walking away from a sales contract or lease" because of Energy Star rating disclosure. Another interviewee argued that the fundamental needs are "policy and benchmarking" to enable everything else on energy efficiency retrofits to occur, noting that both a market for white tags and data from benchmarking would be incredibly helpful.

Recognition Programs

Three interviewees stressed the importance of recognition programs, whether for owners or for tenants, to motivate action on efficiency upgrades. Foundations could either create their own recognition programs (without reinventing the wheel and watering down the existing market) or could recruit more organizations or cities to participate in the existing programs, like BOMA's Kilowatt Crackdown challenge or its recently concluded 7 Point Challenge. A fourth interviewee suggested a need for a separate kind of stamp or verification that shows a building is properly operated, to spur developers, investors, owners, and others to recognize the importance of a good operator and the potential savings of real-time commissioning (e.g., cleaning coils).

Conglomerating Key Actors

Three interviewees advanced the idea of conglomerating key actors for a focused push. (Note: these focused pushes could conceivably take place within the context of pilot projects.) One interviewee suggested collecting 20-40 top owners of office space, getting them together in a room, showing them the energy efficiency business case and path forward, and spurring them to take action in 1 billion square feet of office space. Alternatively or additionally, this interviewee suggested identifying the top 20 tenants (in terms of square feet) in 20 markets, having a sit-down conversation with each CEO (or whoever is relevant) about the business case for efficiency, and having these tenants in turn send a letter to the top owners of office space in each

market saying that efficiency is important, the tenants are looking for space that has these attributes, and the tenants will not go to spaces that lack them.

Another interviewee suggested approaching Energy Star buildings that have received low scores, as they have already shown interest by applying for Energy Star but have been unable to achieve their goals. Similarly, another interviewee suggested targeting the 500 buildings in a market that are the lowest performers (through benchmarking).

Other Ideas

Interviewees suggested some other possible priorities as well, including:

- Funding groups that can help innovate on technology (e.g., making chillers 20% more efficient).
- Supporting the Garrison Institute's efforts on Climate, Buildings, and Behavior, which seeks to apply insights from social and behavioral science to what is needed to change energy use and message energy efficiency to building users.
- Educating utilities about the importance of providing electricity user information, to enable demonstration to building owners and users of the value of energy efficiency.
- Exploring ways to revise the Illuminating Engineering Society's standards for lighting in commercial buildings, which provide for far too much light.
- Exploring ways to improve the process of underwriting building acquisitions to better account for investments in energy efficiency improvements.

It is also worth noting that one interviewee expressed extreme pessimism "that a foundation can come in, spend some money, and make a difference in the world" on this issue. The question of how $10 million could best be spent to spur deep energy efficiency retrofits at scale was deemed to be "a silly question".

Discussion & Analysis

Interviewees frequently commented on the vast amount of efficiency information and programs already in the market and the difficulties encountered in trying to sort through all the clutter and noise, yet they also cited a need for more education, information, and tools. Many interviewees seemed relatively unaware of the range of already existing programs (on-going and past) designed to address some of the very "needs" and "approaches" they identified.

With respect to the roundtable's top three approaches:

- If the foundations pursue them, pilot projects should be surgical and non-duplicative. Noteworthy interviewee suggestions for pilots include testing low- and no-cost technologies (e.g., carbon dioxide sensors) that are underutilized and that can achieve significant energy savings, exploring the effectiveness of engagement with targeted communities (e.g., brokers), and documenting the efficiency gains from properly training building operators on their operating systems. To the extent practicable, foundations should explore the feasibility of identifying existing programs that could be used to test these ideas rather than creating new pilots.

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- If foundations decide to pursue the NYCEEC approach, they may want to first get a better sense of which actors in the marketplace actually need capital and how to structure the involvement so that the benefits actually reach others outside New York.
- There are many good reasons for foundations to put their money where their mouths are when it comes to their own real estate holdings and investments. However, if foundations are going to go this route as part of an attempt to go deep at scale with energy efficiency retrofits, they may want to consider linking up with other foundations or others in real estate – or in some other way tackling the fact that successes that are limited to the foundations' properties alone would not achieve the scale the BRIM foundations seek. Foundations' program-related investments in a retrofit fund are another matter and could have a larger impact, though, as with the NYCEEC option, foundations may first want to get a better sense of which actors in the marketplace actually need capital.

Among the other ideas that would be useful for foundations to pursue further are the following:

- *Compendium of Programs* – Interviewee suggestions have been presented in this report in relatively unfiltered form. Several of the interviewees' suggestions have already been done or tried. Before the foundations jump into funding, they should first make sure they have a good inventory of the programs that are already out there (existing and past) and the savings (and persistence of savings) achieved by those programs, to see if there are existing efforts to fund, build on, or revive. (BOMA, in particular, has many such initiatives with which foundations should become familiar.) Such an effort will not drive change in itself, but it would be a very useful underpinning for further progress.
- *Education / Information (e.g., on Operational Savings)* – The over-riding message from interviewees was a need for greater education, information, and tools about why energy efficiency is strategically and financially important to pursue (and how best to pursue it), designed to cut through the noise, clutter, and other barriers preventing uptake of such information now. "Education" is often the answer people will give to questions such as the ones to which the foundations sought answers, and it can be very challenging for foundations and non-profits to provide education to targeted audiences in a meaningful way. It is an underlying base of knowledge needed for everyone to move forward with retrofits, though in itself it will not be game-changing. Education, information, and tools should undoubtedly be *part* of foundations' efforts to advance efficiency retrofits. Owners, developers, contractors, and others could be good targets for general awareness-raising efforts that can help achieve some sort of "scale" by broadening the pool of informed and active players. (Resources for educating REITs probably need not be prioritized, as REITs represent a very small portion of the market and are generally already engaged.)

  A very strong message emerged from the interviews about the relatively cheap operational changes that could help make progress towards "deeper" energy savings – such as some building operators using their sophisticated energy management systems basically as time clocks. Operational changes can be paired with larger investments in big technology retrofits, but they can also help achieve substantial savings from the technologies already in place. This is an area that presents relatively inexpensive and easy energy savings opportunities and could be a worthwhile focus for foundation

support. For example, foundations could support organizations providing specific skill training sessions for building operators and/or support efforts to get energy efficiency management, retrocommissioning, and other important usable topics included in licensing tests. Two important things are worth noting, however. First, operational savings do not fit well within the "retrofit" framing, suggesting the potential need for a different way to frame and present this opportunity. Second, there have been many efforts over the years to educate various audiences about efficiency retrofits, including on operational savings, so, as just noted, foundations should first look to existing and past programs to figure out what has been successful (including trainings offered by the Association of Energy Engineers).

- Other ideas raised by interviewees that may be worth further exploration include learning more about potential synergies with the Garrison Institute[2] and determining whether a roadmap across the stakeholders involved in underwriting building acquisitions is needed.

A few ideas put forth by interviewees (or building on their input) have at least the potential of leveraging more sweeping change to achieve scale and/or depth, including the following:

- *Policies, standards, & incentives/rebates* – Policies, standards, and incentives/rebates can be critical levers for creating wide-scale change, as they tend to spur changes in many buildings with one fell swoop. Interviewees suggested a range of policy and standard changes that could be important, ranging from disclosure mandates (which show promise but whose effectiveness at spurring changes by building owners is yet to be determined, given how new and few in number they currently are) to changing the excessive Illuminating Engineering Society lighting standards. Incentives and rebates can spur additional action on retrofits. As is clear from the interviewee feedback in this section, some interviewees opposed these approaches, resisting policies (especially mandates) and questioning the efficacy and cost of incentives and the ability to get incentives to those who would not otherwise act, but there are few other tools that can have similarly sweeping impacts.
- *Conglomerating key actors* – Organizing a group of key market actors (e.g., tenants) to exert persistent, persuasive, and powerful market pressure for widespread change could be a strong lever for action on efficiency retrofits. A key question to consider is whether an effort focused on those market actors that are easily organized would reach any actors that are not already engaged. Also, again, foundations should first look to existing and past programs to figure out what has been successful.
- *Focus on achieving scale with lighting and other low- and no-cost upgrades.* In a typical building, lighting upgrades achieve twice the efficiency gains of the next equipment upgrade. These improvements are easier to understand and implement than other improvements and have rapid paybacks. It therefore may make sense to focus on driving lighting upgrades across all commercial building classes (e.g., revisiting EPA's Green Lights program), rather than seeking fuller upgrades. At a minimum, it would be useful to compare the savings that might be achieved by driving lighting upgrades in Classes B

[2] *Disclosure: Stuart Brodsky is on a leadership committee at Garrison.*

and C (i.e., scale) to the savings from driving more comprehensive upgrades in Class A (i.e., depth). Similarly, driving adoption of other low- and no-cost technologies could help achieve greater scale, as they provide easy, cheap energy savings.

- *New building ownership efficiency ethic* – Foundations could support a focused effort to create a widespread ethic of efficiency and retrofits among building owners and all connected with the industry. Such an effort might include reviewing existing retrofit challenges to the industry from the President or other elected officials and both simplifying and expanding them for larger impact, broader education about the benefits of building retrofits, or public recognition or embarrassment for those who do the right or wrong thing. The idea would be to try to replicate the ethic that has started to grow stronger concerning recycling – i.e., to make it something that people just feel they ought to do as a matter of course. There is considerable research from the academic community about how society establishes norms, as well as work being done by groups such as the Garrison Institute, which the foundations may wish to analyze.

RESEARCH NEEDS: OFFICE

Comments on the Top Three Research Needs from the Roundtable

The expert roundtable this summer also came up with a list of the top three research needs for advancing the top approaches in the office sub-sector:

- Case studies with actionable information on all aspects of retrofits, written for different audiences, with "commercial quality" data.
- Research on how to build demand for retrofits, learning from ongoing programs.
- Research on the non-energy benefits from retrofits (commercial office property value, health of office occupants, worker productivity, tenant retention, etc.), including perhaps how to quantify them in a robust way.

The limited time availability of many interviewees meant that several were not asked about research needs at all, so the extent of the feedback the DGA team collected is not particularly deep. To the extent that interviewees did express opinions about the roundtable's top three research needs, they tended to be spread across support, opposition, and somewhere in-between, and they tended to address the first of the three (case studies) more than the other two.

Opposition to the top three research needs did not focus on each one individually. Rather, two interviewees, when presented with the list, just said they saw no value in those items. One interviewee stated that "it's all out there" already, such as on the DOE commercial building alliance website and the in the research being done by the national labs. Another interviewee similarly asserted that he did not see "any gaps in the information available" and thought there is "enough of all that out there already." As this opposition covered all the listed research needs, there is no "Oppose" category described under each individual research need below.

Case Studies

Interviewee feedback on the case studies idea is, by necessity, tied to the feedback on the pilot project "top approach", given the tight connection between pilot projects and case studies.

- *Support* – One interviewee suggested that case studies needed to focus on overall energy consumption reduction from buildings instead of on reductions from common areas such as bathrooms and lobbies – and that the information needs to be simple and accessible for owners. Another interviewee indicated a need for case studies related to keeping tenants, getting new tenants, losing tenants, etc. – in other words, case studies focused not just on technologies but also on how everything tied to the retrofit relates to tenant flows (e.g., how the math is different depending on lease structure).
- *In-Between* – A few interviewees expressed mixed views about case studies. One suggested that case studies are critical but often too long, and, as noted earlier with respect to the pilot project approach, "our building is *always* different." Another interviewee similarly maintained that case studies are often ineffective because they focus on top companies with lots of money and resources to implement retrofits, as opposed to scaling case studies to the target audiences in a way that is closer to home. Another interviewee argued that case studies are often misleading in focusing on an

individual step as opposed to a more strategic and holistic sequence of steps. In addition, a couple of interviewees indicated that given the large volume of case studies already in existence, a more useful (and cost-effective) approach than doing more would be to collect the existing ones. One interviewee suggested developing a robust white paper summarizing a large volume of existing case studies, highlighting best practices, models, success stories, economic benefits, and other key findings (e.g., reviewing a hundred case studies on lighting retrofits and LEDs), while the other interviewee suggested that a searchable database might be even better, enabling people to search for examples based on particular upgrades (e.g., lighting, water, heating).

Research on How to Build Demand for Retrofits

Interviewees provided no feedback on this particular research need.

Research on Non-Energy Benefits of Retrofits

There was fairly minimal feedback on the idea of research on the non-energy benefits from retrofits (e.g., property value, worker health, worker productivity, tenant retention). The little specific feedback there was, however, was generally positive.

- *Support* – A couple of interviewees suggested that it would be valuable to provide data demonstrating that more advanced energy-efficient buildings lead to a decrease in sick days for employees in those buildings. One interviewee also noted the need for data, where it does not already exist, on whether buildings with better energy efficiency, LEED certification, Energy Star scores, etc. actually sell for more than comparable buildings without those.
- *In-Between* – One interviewee noted that a lot of the non-energy benefit information "is pretty well understood now" but indicated there may not be much on "the tenant retention piece" for individual upgrades.

Other Research Needs Raised by Interviewees

In addition to the research needs raised by the expert roundtable, interviewees identified a few other specific needs, including:

- Figuring out why every giant portfolio exhibits such large variability in energy performance – far larger than technology differentials, weather, and climate would suggest. One interviewee suggested that the differences in performance within a portfolio are "large enough that it leads you away from 'what equipment do we need to retrofit' because the difference exceeds the gains from any retrofit." Energy Star apparently has a "massive collection of data" that a researcher could analyze to potentially illuminate the issues around these performance differences.
- Conducting a fine-grained survey (if DOE and EPA have not already done so) of what has worked for buildings and what has not in terms of administrative models for energy efficiency programs (e.g., the funding collected via the public benefit charge on ratepayers) across the United States.
- Analyzing the cities with benchmarking regimes to assess whether they are collecting the same information and to compare what is working in one place versus another.

- Figuring out some way to rank actions by relative likelihood of reducing costs, increasing rents, reducing energy consumption, and the like, in order to enable prioritization of efforts to deploy "a behavioral regime focused on tenants versus one focused on facilities managers versus capital investment on a new skin or HVAC system" (assuming this kind of research is even possible).
- Helping distinguish the separate "value-adds" from the individual elements of the fragmented green building world – Energy Star versus LEED versus GreenPrint versus the Global Real Estate Sustainability Benchmark (GRESB).

Discussion & Analysis

The limited feedback on research needs limits the DGA team's ability to provide meaningful guidance here. However, if the foundations are going to pursue funding for research needs at all, the DGA team recommends:

- *Online case study compendium* – Creating an online searchable database of case studies could be very useful, preferably one that enables different audiences to access the case study data in the formats most familiar to them. While the lack of good or accessible case studies is not really much of a barrier to investment or improvement in energy efficiency upgrades, supporting development of a resource that standardizes collection and allows customization of reports can be an excellent project that few organizations other than foundations would support. (In addition, such a resource might help better disseminate existing answers to several of the research questions posed above. The fact that some of the questions above have already been asked and answered – and yet are still being asked – highlights the need for better dissemination of information.)
- *Comparative benchmarking analysis* – Many of the city benchmarking programs are relatively new, so there may be limited data to compare thus far, but foundations should be prepared to support comparative benchmarking research and analysis in this area in the near future.

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POTENTIAL APPROACHES: RETAIL

Comments on the Top Three Approaches from the Roundtable

The BRIM working group foundations also convened an expert roundtable this summer to begin exploring ways to go to scale and go deep with energy efficiency retrofits in commercial retail buildings. The roundtable came up with a list of the top three things foundations could do in this area:

- Supporting development of incentives and better data, including mandatory benchmarking at a state or regional level, the creation of regional competitions (e.g., using EPA Portfolio Manager and working with the International Council of Shopping Centers), and the creation of a database with energy consumption and finance information.
- Funding multi-stakeholder partnerships, including multi-stakeholder collaboration across the supply chain to commit to goals and identify opportunities, sending senior fellows from non-profits (or elsewhere) to a site to actively problem-solve and engage with C-suite executives, and doing an analysis and case studies of success stories that highlight the business case for retrofits.
- Supporting a "Main Street challenge" like the Better Buildings Initiative but focused on smaller owners and retailers, including setting up one-stop shops for all retrofit information and needs.

Perhaps even more than with the top three office sub-sector approaches, it is important to note that these "three" approaches are not always clear or cohesive; they are amalgamations of a range of ideas presented during the expert roundtables. It was therefore not always clear which aspects of the approach description interviewees were responding to when they said they liked or disliked an idea. Similarly, some interviewee feedback focused only on one aspect of an approach and so did not address every element or the idea in its entirety.

In addition, it is important to recall that some interviewees straddled both the retail and office sub-sectors, so some feedback that was reflected in the office sub-sector sections is reflected here as well.

Interviewees generally supported the three ideas, though the first less than the other two.

Supporting Development of Incentives and Better Data

Interviewee feedback on the first approach tended to center around the concepts of incentives and benchmarking.

- *Support* – One interviewee expressed support for the idea as a whole, suggesting that "the more knowledge out there, the better", "people respond to what their peers are doing", and the approach would lead to "great publicity for first movers." Three other interviewees focused on incentives, with one indicating that they "would like to see incentive programs for initial investment" in energy efficiency technologies, another maintaining that "incentives are huge" because "that's where you really bring in people", and a third noting that, while the database of energy consumption and finance is a good

idea, "because of tighter margins at a lot of retail facilities, incentives become more important."

A couple of interviewees expressed strong support for the benchmarking aspect of this approach, suggesting that to make it work in the retail sector, a few of the major retailers would have to lead the way (as "retail is a very follow-the-leader type of thing"). They also suggested that it may be worth reaching out to the top green contractors in the retail space. Another interviewee remarked that this approach is the most "grounded" of the top three based on an expectation that there will be an increase in local mandates based on Portfolio Manager.

- *In-Between* – A couple of interviewees had a more mixed response to this approach. One remarked that more incentives are a good thing but it was not clear "how effective that spending [by foundations] would be at this point." This interviewee further noted that benchmarking could help but that the Federal Energy Regulatory Commission and state public utility commissions were already requiring utilities to be more open with billing information, providing it in an understandable format, including benchmarking, so the effectiveness of foundation funding in that area is also unclear. Another interviewee noted that some places, like California, have plenty of incentives, so one would first have to look countrywide to see where such incentives are needed and lacking.
- *Oppose* – A few interviewees opposed foundations pursuing this approach. One opposed the focus on incentives and indicated a "philosophical problem with rebates", namely that "businesses may wait until the next rebate before they act again on energy efficiency." Another suggested that "there are way more inefficient buildings in this country than efficient ones", and so it would be "a disaster" to make it mandatory to go on Portfolio Manager and force a baseline, especially for older buildings, and the amount of incentives that would be needed to offset that would be "scary". Another interviewee similarly expressed strong opposition to the mandate, calling it a "non-starter", and also noted the challenge of the site versus source energy issue. Another interviewee suggested that this approach would largely be irrelevant to independent small retail businesses that would not care much about the savings from new lighting systems and that lack the capital to put out in anticipation of returns in a few years.

Funding Multi-Stakeholder Partnerships

Interviewees were generally supportive of the second approach of foundations funding multi-stakeholder partnerships, including multi-stakeholder collaboration across the supply chain to commit to goals and identify opportunities, sending senior fellows from non-profits (or elsewhere) to a site to actively problem-solve and engage with C-suite executives, and doing an analysis and case studies of success stories that highlight the business case for retrofits. This "approach" actually encompasses several ideas, and interviewees generally focused on particular aspects in their feedback.

- *Support* – Several interviewees thought aspects of this approach were good ideas. One interviewee noted the "very horizontal market" that exists in the United States as opposed to Europe, with lots of players with different roles, which could make multi-stakeholder initiatives valuable in figuring out "if their incentives are well-aligned or not." Another interviewee also liked the general idea of multi-stakeholder engagement and education,

positing that there could be huge value in arranging a partnership of tenants and ownership at one site or in educating a partnership of the small number of companies that are in very mall everywhere about how to reduce costs.

With respect to the problem-solving senior fellows, one interviewee deemed this approach to be "the best" because it involved "putting people out there to talk one-on-one with the C-suite" about things that can be done. Another similarly appreciated the idea of senior fellows making site visits, noting that "if that resource is created and is knocking on doors, that is a benefit" that would not otherwise happen. Another interviewee generally expressed support for addressing the need for more top-down involvement and engagement by CEOs recognizing energy efficiency as a strategic imperative.

- *In-Between* – A few interviewees had more mixed reactions to this approach, partly due to the fact that they needed more information about this multi-faceted approach to really understand it. One indicated a need for "more information to have an informed opinion" but generally could not see "why that wouldn't be helpful." A couple of other interviewees similarly expressed doubts about their understanding of what this approach encompassed, noting that for any multi-stakeholder engagement in retail, it will be important to look at the lease agreements to see who is paying the electric bills. Another interviewee suggested the multi-stakeholder approach with case studies "could be helpful but has been done in the past" and is unlikely to yield immediate reductions or produce anything "quick and deep".
- *Oppose* – No interviewees squarely opposed this approach.

Supporting a "Main Street" Challenge and One-Stop Shops for Retrofit Needs

Most interviewees supported the idea of a "Main Street challenge" like the Better Buildings Initiative but focused on smaller owners and retailers, including setting up one-stop shops for all retrofit information and needs, though a few interviewees opposed the idea or were somewhere in-between.

- *Support* – Several interviewees liked the idea of the Main Street challenge and/or the one stop shops. A couple of interviewees suggested that retailers would welcome a non-profit one-stop shop that is "trustworthy" and an "honest broker" and that could provide answers to all their retrofit questions at once, especially if they also did site visits and provided audits and analyses; the approach "could be a solid building block for getting good knowledge out there and sifting out the bad". Another interviewee similarly remarked on the value of having trustworthy sources that are able to provide retrofit answers and ideas to small business people

  Even in support, a few interviewees flagged some cautionary issues for foundations interested in this approach. One suggested that the challenges would have to be done locally or regionally, have good implementation, and generally avoid focusing on "most improved" (as that disadvantages those already doing good things). Two others warned that "energy is not a big priority for smaller retailers" due to lack of time, knowledge, and staff and that "the trick is really getting their attention", but they felt that a friendly local competition (perhaps coupled with incentives) could be valuable.

- *In-Between* – A few interviewees had somewhat mixed reactions to this approach (recognizing that there is a fine line between falling somewhere in-between support and opposition and supporting the approach with some cautionary flags). One interviewee, for instance, liked the idea of a one-stop shop for small businesses but warned that "small customers are very non-cost-effective to deal with" and generally cannot handle the transaction costs involved in retrofit engagements (e.g., having an engineer pay a site visit), so foundations would need to find a way to create an organization that makes it more cost-effective without dumbing it down to the point where it is no longer beneficial. Another interviewee suggested that the Main Street challenge is a good idea but "will probably pull in the ones more likely to do it anyway."
- *Oppose* – A couple of retail interviewees opposed this approach. One indicated that "there is a lot of information out there already", so "adding more meetings or calls" may not be significant or provide "any kick in the pants." Another interviewee remarked that a locally-driven energy efficiency retrofit campaign or challenge program would not be likely to catch the attention of small independent retailers who generally limit store maintenance to replacing burned-out light bulbs and occasionally repainting after the store is closed; even if a retrofit would save money, such retailers would "fuss with who is going to move the merchandise stock and how to not interrupt customer access while things are being renovated."

Other Approaches Raised by Interviewees

In addition to their views on the top three approaches raised during the roundtable, interviewees offered several other "top" approaches for foundations to consider in the retail sub-sector. As was the case in the office sub-sector, many of these focused on the need to provide some sort of education, information, or tools to a range of players in the market. Other suggestions included focuses on technology fixes or promotion, policy, recognition, and foundation board leadership.

Education / Information / Tools

The majority of interviewees focused on the importance of providing education, information, or tools to key actors in the market. This included:

- *Filtering vendor noise* – Two interviewees (one of which also has expertise in the office sub-sector) noted the need to provide information to enable people to sort through all the claims, products, and services offered by vendors. As noted in the office section, one interviewee noted that there are a lot of firms selling "blue-sky products that sound good but do not achieve what they are supposed to" and providing "some debunking" would be valuable (though, again, as a caution, this interviewee also noted that most engineers do not trust the free support/analysis opportunities that are already out there, believing there must be a catch). Another interviewee noted the rarity of energy experts within retail organizations and the challenge of being able to "filter out all the scams", suggesting that out of all the audits, services, and products in the marketplace now, probably only about 30 percent are "real". This interviewee stressed that "you can't trust your vendors" and that there may be a role for non-profit organizations to provide unbiased information (the interviewee mentioned that there is an existing organization that charges an annual $30,000 fee to provide that kind of Consumer-Reports-type service). Relatedly, this interviewee identified a corollary problem, namely the challenge of finding a way for the

good products that do exist to even cross people's radar screens. Accordingly, this interviewee emphasized the need for "education that sifts out what's real and what's not" and that helps to "age the industry a bit."

- *Providing skills training and education for technical facilities staff / engineers* – Three interviewees identified a need for improved skills training and education for technical facilities staff on energy efficiency. As noted in the office sub-sector section, one interviewee noted that buildings "have building control systems that are just amazing and are being used as time clocks", that there is nowhere that engineers can take real courses in energy efficiency management, retrocommissioning, and other important usable topics, and that perhaps foundations could pursue efforts to include these efficiency components in licensing tests (in jurisdictions where they are not already included). This interviewee indicated a general need to educate engineers that a system that is not broken may still need to be changed and suggested creating an online tool in which building staff could enter their actual equipment, its age, and some utility information and produce potential scenarios for efficiency upgrade opportunities (operational and technology) and potential payback periods. This interviewee further noted that engineers in the retail sub-sector tend to be less sophisticated than those in the office sub-sector.

  This view was backed up by two other interviewees. One suggested a need for "training technical staff and creating a reporting system that creates accountability," pointing out that "you don't improve efficiency, or anything, unless you measure it." The other interviewee remarked that "facilities people are really in charge of energy in many companies" in retail, but many of them do not trust or understand new efficiency technologies, do not want to put their jobs on the line for them, know the stores can be run the way they are now, and do not want to risk making an unprofitable decision. Accordingly, this interviewee suggested that education is needed to make people trust the technology (even, and perhaps especially, light bulbs) and feel confident in the financial business case behind it.

- *Promoting general education and tools for tenants, owners, and others* – In addition to these specific educational / informational suggestions, a few interviewees flagged the general need for energy efficiency education, including for tenants, owners, and senior management. Specific suggestions included:

  - Creating a free evaluation toolkit that includes a reliable, easy-to-fill-out template with serious economics behind it that would allow people to really understand the financial benefits of efficiency retrofits, taking into account several types of analyses (NPV, IRR, etc.).
  - Providing business owners with information about the economic benefits from investing in new capital and/or technology and generally trying to elevate the profile and awareness of energy efficiency opportunities.
  - Reaching tenants with education on the opportunities related to their responsibility for utilities, light replacements, HVAC maintenance, and the like.

Technology Fixes / Promotion

Interviewees also offered a few suggested ideas that focus squarely on technological approaches, including:

- Working to remove the barriers that limit opportunities for better use of energy management / monitoring systems, such as the fact that there are a lot of proprietary software and protocols in the marketplace, which may require retailers to buy three different systems if they want to have "the ultimate information and system feedback on buildings."
- Supporting "non-profits who can change technology" and can "get the technology to where it needs to be."
- Providing or promoting sub-meters, as people who pay for their own bills have greater incentives to try to reduce those bills.
- Identifying a technology that could be of interest in the restaurant or retail sector that can generate a lot of energy efficiency gains and then trying to secure a commitment from an entire sector to adopt it.
- Exploring ways to revise the Illuminating Engineering Society's standards for lighting in commercial buildings, which provide for far too much light (as noted in the office section).

Promoting Policies / Codes

Two retail interviewees offered their views on pursuing policy approaches, with one in favor and one expressing much more caution. The interviewee favoring pursuing a policy approach argued that code changes can create a level playing field for retail companies, can save a huge amount of energy, and may be the only place that philanthropic money could make a deep impact (outside of money for technological upgrades). This interviewee called for "policy advocacy and education" to change the codes or tax structures "so that it is too hard *not* to do this stuff." The other interviewee noted that policy requires "force and taxpayer dollars" and can be a "slippery slope", as progress can grind to a halt when funding runs out. This interviewee further observed that policy can promote retrofits but "it does not change the fundamental reservations people have about technology and techniques."

Other Ideas

Interviewees suggested some two other possible priorities as well, which were also raised by others in the office sub-sector section:

- Enabling retail companies to be recognized for an award for their efficiency retrofit efforts, as "these public companies also love having their name in lights."
- Getting "the leaders of the foundations and their board members to call up and campaign their influential friends to get energy efficiency done," spurring one-by-one conversations, from leader to leader, to get energy efficiency seen as a strategic imperative.

Discussion & Analysis

As in the office sub-sector, interviewees frequently commented on the vast amount of efficiency information and programs already in the market and the difficulties encountered in trying to sort through all the clutter and noise, yet they too cited a need for more education, information, and tools. Again, many interviewees seemed relatively unaware of the range of already existing

programs (on-going and past) designed to address some of the very "needs" and "approaches" they identified.

With respect to the roundtable's top three approaches:

- Incentives, better data, and benchmarking are, in themselves, usually good things. Foundations pursuing the idea of supporting development of incentives and better data, including mandatory benchmarking, should be aware of the limitations of incentives, identify where they are lacking and needed, reach out to leaders in the retail space on benchmarking, and decide whether voluntary or mandatory benchmarking is the best path forward.
- The general idea of multi-stakeholder engagement seems worth pursuing, though the description of the concept is somewhat vague. In particular, sending outside fellows to engage on-site with companies and executives seems like it could be a valuable resource, assuming it is well-designed, well-implemented, and non-duplicative of other similar programs out there. EDF already has a Climate Corps that sends MBA students to organizations to achieve significant energy savings. Such a program could help some buildings realize much deeper energy savings. The program could also be leveraged and significantly expanded to a much wider range of building classes, smaller retailers, and others that have been relatively untouched by existing programs, but that would require a very large number of fellows. There are a few key questions to consider in this approach. First, is such an effort cost-effective or even feasible? Second, would it really be able to leverage significant change at scale – would it ever be able to reach enough buildings? Third, why does it even take an outside fellow to identify and act on these potential energy savings, as opposed to companies, owners, and retailers doing it on their own?
- Pursuit of a "Main Street" Challenge and one-stop shops for small retailers may be beneficial, but foundations should keep in mind the array of significant red flags raised by interviewees – in particular, the challenge of actually reaching those who would not have engaged anyway and who have no time, bandwidth, or capital to do anything major in their stores.

Among the other ideas that would be useful for foundations to pursue further are the following:

- *Compendium of Programs* – As noted in with respect to the office market, before the foundations jump into funding, they should first make sure they have a good inventory of the programs that are already out there (existing and past) and the savings (and persistence of savings) achieved by those programs, to see if there are existing efforts to fund, build on, or revive. Such an effort will not drive change in itself, but it would be a very useful underpinning for further progress.
- *Education / Information* – There are leaders in the retail sector who have been very successful in the area of efficiency, but as in the office sector, the dominant message from several interviewees was that many actors do not really understand efficiency benefits, technologies, and practices. Again, the interviewees cited a need for greater education, information, and tools, designed to cut through the noise, clutter, and other barriers preventing uptake of such information now. Education, information, and tools should undoubtedly be *part* of foundations' efforts to advance efficiency retrofits,

including, as noted with respect to the office market, a potentially worthwhile focus on achieving deeper operational savings.

Only one interviewee advocated for changes to *policies and codes* in order to create a more level playing field in the retail market. As noted with respect to the office market, policies can be critical levers for creating wide-scale change, but further inquiry is needed to identify the key policies to spur action in the retail market.

RESEARCH NEEDS: RETAIL

Comments on the Top Three Research Needs from the Roundtable

The expert roundtable this summer also came up with a list of the top three research needs for advancing the top approaches in the retail sub-sector:

- Understanding and developing a playbook on how to integrate different pools of capital (utility, federal, state, community development funds, etc.).
- Detailed case studies on success stories, documenting who has done retrofits, why, how it got internal approval, what was done, how it was financed, and what the results were.
- Better understanding the motivations and benefits for retailers, owners, customers; how to reach them with a retrofit program; the impacts of retrofits on sales, employee health, property value, etc.; and how to work with appraisers on appreciating the value of retrofits.

Even more than with the office sub-sector interviews, the limited time availability of many retail interviewees meant that most were not asked about research needs at all, so the extent of the feedback the DGA team collected is extremely shallow. To the limited extent that interviewees did express opinions about the roundtable's top three research needs, there was a relatively even split between support and opposition, though no one opposed the first idea on developing a playbook on pools of capital.

Understanding and Developing a Playbook on How to Integrate Different Pools of Capital

Two interviewees offered limited feedback supporting the need for understanding and developing a playbook on how to integrate different pools of capital. Both indicated the playbook would be "helpful", and one suggested that it "would have to be a living document because it all changes so often."

Case Studies on Success Stories

The three interviewees that offered views on the need for detailed case studies on success stories split into support, opposition, and in-between. The supportive interviewee indicated that case studies could be helpful if delivered in the right way – i.e., not as "a 400-page report that will sit on a shelf." The interviewee with more mixed views remarked that case studies "can be helpful or can be useless", that one should never take a case study at face value, and that case studies, though helpful, are never a basis for making decisions. The interviewee opposed to producing case studies simply asserted that "a lot of that is already out there."

Better Understanding Retrofit Motivations and Benefits

Two interviewees offered limited feedback on the need for better understanding the retrofit motivations and benefits for retailers, owners, and customers. One interviewee supported the idea, noting that "retail is all about the customer experience" and so "the marketing and PR angle" can have a much bigger impact in the retail sub-sector than in the office sub-sector. This interviewee suggested researching whether "green retailers do better" and conducting customer surveys to figure out how much such issues make a difference to them, what else customers

would like to see, etc. Another interviewee opposed this research need, asserting that "that stuff is mostly on the sidelines."

Discussion & Analysis

The extremely limited feedback on research needs limits the DGA team's ability to provide meaningful guidance here. However, if the foundations are going to pursue funding for research needs at all, the DGA team recommends:

- *Online case study compendium* – Retail sector case studies should be included in the online searchable database of case studies suggested under office sector research needs.
- *Energy monitoring for smaller retail* – A research need tied to one of the other interviewee-suggested approaches involves developing a better understanding of how energy monitoring/management systems would impact consumption in less sophisticated retail spaces, which would illuminate whether pursuing efforts to remove barriers to better use of such systems would help achieve scale and depth.

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PROMISING GEOGRAPHICAL LOCATIONS TO TEST APPROACHES

Interviewee Suggestions on Promising Geographical Locations

Interviewees identified several geographic markets or cities that could be well-positioned to initiate or further pursue proactive efforts to build the market for commercial retrofits, though responses tended to focus on the "obvious" places to advance efficiency. The answers among office and retail interviewees were virtually identical and so are combined here.

In general, most interviewees recommended places that have disclosure mandates (or other similar legislation) and/or very high electricity prices. In places with disclosure mandates or similar policies, interviewees noted that "you already have people paying attention to the issue", plus "in these markets where they are obligated to do this, it would be valuable to provide information on how to do this." In places with high electricity prices, energy efficiency upgrades are easier because the high prices equate to quicker payback periods. Interviewees thus tended to suggest places like New York City (and the NY/NJ area including Long Island), Washington DC, Philadelphia, Austin, Seattle, San Francisco, and Chicago, with a couple of votes for Baltimore (which apparently has both a green lease mandatory requirement and a prideful desire for recognition) and Boston as well. Even though these are in many ways the "obvious" places, interviewees maintained that there is still "tons of low-hanging fruit" in these cities, that foundations could still "have a big impact if they went way deep" there, and that if you lead the way in these first-tier cities, "it will happen in other cities."

Many interviewees suggested California (and in some cases, the entire West Coast) as a whole, in addition to cities such as San Francisco, Los Angeles, and San Diego, not only because of policies and high electricity prices but also because of a general culture that in which "they want to save the world regardless of the cost" and are "early adopters of a lot of these feel-good energy things." One interviewee suggested that foundations "double down their efforts in Seattle, San Diego, and San Francisco." A couple of interviewee, however, raised the possibility that California may be "pretty saturated" – i.e., so far ahead of the game in terms of building codes and incentives that additional incentive efforts there may not make much difference.

Two interviewees flagged Texas as an interesting possibility because its incentive programs seem to sell out and oversubscribe very quickly and because the state may be at a point where it either needs to expand capacity or reduce demand.

One interviewee framed the choice (without recommending an answer) as focusing on the cities such as these, where there is the most consumption, the most square footage, a fairly small number of owners, and committed public servants, versus focusing on a larger number of property owners in a lager range of places even if they are not as responsible for electricity consumption, as we may never get to scale without broader outreach. While, as noted, many interviewees opted for the former, a few suggested consideration of the latter approach.

One interviewee argued that "markets are already making a difference in Class A buildings in marquee cities" and that foundations should instead "do things in places people don't expect", focusing on Class B and C buildings in secondary and tertiary markets like Des Moines, San Antonio, and Detroit. Another interviewee had more of a middle position, suggesting cities like

Boston, San Diego, Denver, and Seattle where the markets "have a willingness and receptivity in this space and are not so big as to be buried by all the other things going on in that market."

Interviewees also suggested Honolulu, central California (e.g., Fresno), and Florida, without elaborating much on the reasons for those recommendations.

A couple of interviewees stressed the importance of picking a few different geographic regions and focusing on different energy efficiency priorities that address regional weather differences.

Discussion & Analysis

To the extent the foundations decide to focus on specific geographies, their goals in advancing energy efficiency retrofits will in some ways dictate the choice of geography (and, for that matter, building classes):

- Foundations with a primary interest in going "deep" with energy savings should probably focus their efforts on the major cities that interviewees recommended (where Class A buildings have been the primary targets). These are places that already have high electricity prices that give shorter payback periods, engaged market and government actors, and various policies and incentives to support action.
- Foundations with a primary interest in going to "scale" with energy efficiency retrofits may want to consider promoting efforts in more secondary markets to bring more buildings into the retrofit world (and/or focusing on Class B and C buildings in the primary markets). It is possible that efforts in the major cities will trickle down or spread to other smaller cities, but there will still need to be at least some direct efforts in those places to raise awareness and spur action. Foundations may want to identify regions/markets that are under-stimulated, understand why they are under-stimulated, and identify programs (preferably already existing) that could be used to stimulate them towards greater efficiency; Energy Star data may aid in that analysis.
- It should be noted that interviewees were only asked about energy savings, going deep at scale with energy efficiency retrofits, and the like. The issue of greenhouse gas reductions was not raised at all in the interview questions, nor by a single interviewee. If foundations are primarily interested in reducing greenhouse gas reductions from buildings, then that might suggest a different geographic focus – one that is based at least in part on how coal-based the power sector is in various locales.

PROMISING LEADERS TO IMPLEMENT APPROACHES

Interviewee Suggestions on Promising Leaders

Interviewees identified a range of organizations that could be good candidates to play an active role in promoting or administering the implementation of approaches to spur energy efficiency retrofits in commercial buildings to go deep at scale.

Within the office sub-sector, organizations mentioned by interviewees included:

- *Building Owners and Managers Association (BOMA)* – BOMA was the organization mentioned by far the most frequently by interviewees. BOMA is seen as a well-respected, well-known mainstream partner with some green initiatives that can provide foundations with a stamp of approval and a conduit to the property manager and owner communities, as well as with ideas of how best to engage the communities. It also has many local chapters. One interviewee suggested that if BOMA recommends actions, their members know there is a good business case behind it. On the other hand, interviewees suggested that BOMA is apparently stronger in some geographies than others, its staff is already apparently stretched thin, it is not likely to adopt many new efforts (though it would probably welcome support for what it is already running), and it is not likely to include foundations' names in its efforts (to the extent foundations are looking for a "visual splash").
- *National Association of Real Estate Investment Trusts (NAREIT)* – NAREIT was identified by a few interviewees as a potentially useful conduit for foundations to reach REITs on efficiency issues. One interviewee described NAREIT as "important" and as tending to include the high finance institutional real estate investors. Another interviewee described the organization as "slowly getting there" on energy efficiency.
- *Urban Land Institute (ULI)* – A couple of interviewees identified ULI as being another key organization. ULI is a non-profit that involves the entire spectrum of real estate development and land use. One interviewee suggested that ULI is an organization in which many property managers participate, along with owners, leaseholders, and others, and that it might therefore be a good organization to work with on education efforts to reach professionals across a broad cross-section of the industry. Another interviewee noted that ULI is already "doing good stuff" on efficiency, though one interviewee suggested that ULI engages the portion of the market that is already engaged on efficiency.
- *Institute of Real Estate Management (IREM)* – A few interviewees mentioned IREM as a good way to reach out to property managers. Like BOMA, IREM has local chapters, but it appears to be more specialized and, according to one interviewee, more likely to be open to efforts that prominently include foundations' names (again, to the extent foundations are looking for a "visual splash").
- *Energy Star* – A few interviewees identified Energy Star as having access to some of the target audiences and having the ability to distribute educational materials. One interviewee suggested that foundations will need to partner with an organization like

Energy Star that "already has a relationship with the market" and "can cut across the noise and get to the end user."

- *CoreNet* – CoreNet is an association of corporate real estate professionals, service providers (e.g., brokerage firms and architects), and developers, which could be a potentially useful conduit for foundations interested in pursuing corporate-owned facilities. A couple of interviewees identified CoreNet as one of the key organizations to have involved in education and messaging efforts.
- *Commercial Real Estate Energy Alliance (CREEA)* – The Commercial Real Estate Energy Alliance (CREEA) is an industry-led association of commercial property owners and operators, coordinated by the Department of Energy (DOE), that works to advance efficient building technologies, promote the construction of high-performance buildings, and reduce the energy consumption and carbon footprint of the commercial real estate market. Basically, DOE has roundtables with the real estate industry, learns about the industry's hesitations to adopt new technologies, funds one of the DOE labs to test the technologies, and then issues an unbiased report that helps the industry understand the technology better and reduce risks associated with adopting it. A couple of interviewees mentioned CREEA (or a CREEA-type effort) as a good potential fit for foundations. One interviewee noted that CREEA is likely to be rolled into the Better Buildings Initiative, though CREEA members remain great potential connections. Another interviewee suggested the desirability of creating another CREEA based on the DOE model.
- *Leadership in Energy and Environmental Design (LEED)* – LEED is the U.S. Green Building Council's very well-known green building program and rating system; it was mentioned by only two interviewees. One interviewee reluctantly mentioned LEED as a possible leader to connect with in pursuit of the foundation's efforts, noting that LEED largely leverages real estate assets against themselves "for the betterment of consultants and vendors" but that it is impossible to deny the improvements to buildings. Another mentioned LEED as having some access to building engineers.
- *Vornado Realty Trust* – Vornado is a REIT that is one of the largest owners and managers of commercial real estate in the United States. One interviewee mentioned that Vornado is already doing a lot in this area, has dedicated funding for energy efficiency, is pursuing combined heat & power, and has the capital to pursue a range of efficiency retrofit efforts. If foundations wish to engage with leaders who might be able to help move others, this interviewee suggested they speak with Vornado. Another interviewee similarly suggested that if foundations decide to roll out "something new and different with real money", they should first vet it with Vornado, Hines, USAA, and other Class A owners and managers that have been active in support of efficiency retrofits.

Individual interviewees also mentioned a range of other organizations that might be worth contacting, including: the Property Management Association in the Washington, DC area (which has apparently done an outstanding job on the residential side in creating competitions and awards to get properties to improve and could be looked at for good ideas or models); the International Facility Management Association (to reach facilities managers), the National Association of Power Engineers, the National Electrical Contractors Association and its Electrical Contracting Foundation (ECF, or ELECTRI'21), the Real Estate Roundtable, NAIOP (the Commercial Real Estate Development Association), the Institute for Market Transformation,

the Rocky Mountain Institute, the Alliance to Save Energy, the Energy Future Coalition, and Ceres. One interviewee also urged collaborating with organizations that are "local and in the community", "credible", and "can get stuff done", like the regional energy efficiency collaboratives.

Within the retail sub-sector, unlike the office sub-sector, there was little repetition among interviewees with respect to organizations mentioned as potential leaders or partners. In fact the only organization mentioned by more than one interviewee was Energy Star. Beyond that, others mentioned included the International Council of Shopping Centers (ICSC), Food Marketing Institute (FMI), National Restaurant Association, Edison Electric Institute (EEI), DistribuTech (which is more on the utility side of the industry), the Illuminating Engineering Society (which has lighting standards that are too high), the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), the National Association of Power Engineers, the National Automobile Dealers Association, small business development centers (including Small Business California), the top retail owners (like Simon Property Group), and a group (whose name the interviewee could not remember) within the "normal retailers association" that talks about sustainability in retail and improving facilities (perhaps the National Retail Federation's Sustainable Retailing Consortium).

Discussion & Analysis

Interviewees suggested a very wide range of organizations. DGA recommends the following as having the highest potential for immediate follow-up:

- *BOMA* rose to the top of the list based on interviewee feedback, and this seems right. There is a lot to be learned and leveraged from current and past BOMA initiatives.
- *IREM* could offer good opportunities for foundation partnership and access to property managers.
- The foundations' efforts should leverage as much as *Energy Star* is willing to share. Much of Energy Star's work is in the public domain and is designed to be co-branded. Similarly, the foundations should support efforts to get the findings of *CREEA*'s work into the broader marketplace.

These organizations (and several others on the list) are among those that should be included in any effort to create a compendium of past and current initiatives.

In addition, the interviews suggest that the many private and government organizations working on building efficiency are not "breaking through the noise". This may because the groups that are working in this area are not coordinated or are not engaged in adequate efforts to communicate successes and failures in the area of commercial building efficiency. For example, even among just the non-profits that foundations fund, it is not clear if NRDC's work with cities is coordinated with the Institute for Market Transformation's and the Energy Future Coalition's work in this area, if EDF's Climate Corps is coordinated with these efforts, or if any of these is part of an over-arching strategy. There is also a vast array of building labels, such as Energy Star, LEED, Green Globes, and the Living Building Challenge, with new labels potentially emerging from initiatives on Net Zero Buildings and High Performance Buildings. To break through the clutter that is out there, the foundations may wish to insist on stepped up

collaboration and coordination among even just the non-profit groups working in this area. This could be accompanied by a significant communications effort designed to drive even more action by building owners, tenants, investors, policy makers, and others. It may also be appropriate to include other organizations from the private and public sectors, such as BOMA, IREM, and Energy Star.

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APPENDIX A: INTERVIEWEES FOR BOTH OFFICE & RETAIL

Listed below are the individuals interviewed for this paper. Several interviewees were expert in both the office and retail sectors.

- Dan Adler, *President*, **Adler Financial Group**
- Don Anderson, *Chief Sustainability Officer*, **Blackstone**
- George Caraghiaur, *Senior VP, Energy & Procurement*, **Simon Property Group**
- Jim Chace, *Former (and Founding) Director*, **Pacific Energy Center**
- Candace Damon, *Vice Chairman*, **HR&A Advisors**
- George Denise, *Global Account Manager,* **Cushman & Wakefield** (providing facility management services for **Adobe Systems Incorporated**)
- Susan Hakkarainen, *VP of Marketing and Communications*, & Tom Ike, *VP of Global Sales*, **Lutron Electronics Inc.**
- Steve Kiesner, *Director of National Customer Markets*, **Edison Electric Institute**
- Andy Kitchens, *VP Corporate Engineering Services*, **Hines Property Management**
- Jerry Lawson, *National Manager of ENERGY STAR, Small Business & Congregations Network*, **U.S. EPA**
- Gary Le Francois, *Senior VP Director of Engineering, Mid Atlantic*, & Glen Fernald, *Managing Senior VP & Director of Management Services, Mid-Atlantic*, **Transwestern**
- Gary Levitan, *Manager of Energy and Utilities*, **Saks Fifth Ave**
- Kathy Loftus, *Global Leader, Sustainable Engineering, Maintenance & Energy Management*, **Whole Foods**
- Scott Lyle, *COO*, **Arden Realty at GE Capital**
- Bill Moebius, *Senior VP, Director of Energy & Sustainability*, **Stream Realty Partners**
- Brad Molotsky, *Executive VP & General Counsel*, **Brandywine Realty Trust**
- Kurt Padavano, *COO*, **Advance Realty**
- Dave Pogue, *Global Director of Sustainability*, **CBRE**
- Dan Probst, *Chairman, Energy and Sustainability Services*, **Jones Lang LaSalle**
- Jon Ratner, *VP Sustainability Initiatives*, & Joyce Mihalik, *VP Energy Services*, **Forest City Enterprises**
- Jim Riley, *Chief Development Officer*, **Quality Brand Capital LLC & Sonoran Coffee and Baked Goods LLC**
- Homer Robinson, *President and CEO*, **Kaiserman Company**
- Carlos Santamaria, *VP – Engineering Services,* **Glenborough, LLC**
- Cherie Santos-Wuest, *Principal Investment Officer for Real Estate*, **Connecticut Retirement Plans & Trust Funds**
- John Scott, *Executive VP of Property Management*, **Colliers International**
- Steven Spiegel, *Owner*, **Extra Extra News and Video**
- Randal Stites, *VP of Engineering Services*, **Polinger Shannon and Luchs**
- Nicholas Stolatis, *Senior Director, Global Sustainability and Enterprise Initiatives*, **TIAA-CREF Global Real Estate**
- Mike Thompson, *Portfolio Manager*, **CalSTRS**
- Brenna Walraven, *Managing Director*, **USAA Real Estate**
- Boyd Zoccola, *Executive VP*, **Hokanson Companies, Inc**

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APPENDIX B: INTERVIEW GUIDE FOR OFFICE INTERVIEWS

The Energy Foundation and a consortium of the other foundations have hired us to gather insights about what approaches are most promising to stimulate the commercial office building energy retrofit market and really "go to scale" (i.e., a *significant steady* increase in the amount of capital – particularly private capital – being devoted to building retrofits as part of an evolving self-sustaining market over time) to achieve "deep" retrofits (a minimum of 30% energy reduction, building operations and technologies, over time). As part of that, the foundations want to know what the priority action items are they (and perhaps other market participants) can help with.

(***If not familiar with foundations…***) As background, if you're not familiar with them philanthropic foundations generally fund only non-profits for activities such as policy advocacy, research, convening various stakeholders to share experiences, etc. with the aim of bettering the world in some way.

There will be no attribution in the report – just a list at the back of everyone we spoke with.

1. What do you think the top / most promising approaches are for going deep at scale with commercial office building retrofits? As an expert, what do you think it takes to scale up retrofits?

2. If you had $10 million to allocate to really make a meaningful difference on this, how/where would you spend it?

3. The foundations convened an expert roundtable this summer to begin exploring these issues. That roundtable came up with a list of 3 top things foundations could do in this area. What do you think about these approaches for foundations? Are they also promising? Any notable problems with them?

- Conducting pilots in 5-7 specifically targeted cities, with development of marketing, disclosure, benchmarking, and finance tools, as well as detailed case studies.

- Supporting the very prominent existing efforts of the NYC Energy Efficiency Corporation, which is trying new financing structures for funding retrofits, and then preparing lessons learned and case studies so others can learn from NYCEEC.

- Showing leadership themselves, apart from just making grants, such as through program-related investments to galvanize a fund to support retrofit funding, focusing on their own real estate assets or ones they are invested in (e.g., stimulating advances in energy efficiency in the assets in which they are invested), or having Board members encourage other community leaders to take action to begin retrofits for their properties.

4. Are there particular people or organizations in the commercial office market (whether private sector, government, or other) who are good candidates to play an active role in promoting or administering the implementation of these most promising approaches?

5. Are there particular geographic markets or cities that are well positioned to initiate or further pursue a proactive effort to build the market for commercial office retrofits? Are there any that seem promising as a place to test particular interventions?

(If there's extra time…)

6. What do you think the top / most pressing research needs are for going deep at scale with commercial office building retrofits?

7. What do you think about these research needs?

- Case studies with actionable information on all aspects of retrofits, written for different audiences, with "commercial quality" data.
- Research on how to build demand for retrofits, learning from ongoing programs.
- Research on the non-energy benefits from retrofits (commercial office property value, health of office occupants, worker productivity, tenant retention, etc.), including perhaps how to quantify them in a robust way.

8. If the foundations conduct research projects or fund pilot programs, what do you advise be done with its documentation to provide a benefit to a wider audience? How does the information do something besides sit on a shelf (or in an inbox)?

9. What are the greatest barriers to going "deep" at "scale"? What have been some of the greatest mis-steps?

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APPENDIX C: INTERVIEW GUIDE FOR RETAIL INTERVIEWS

The Energy Foundation and a consortium of the other foundations have hired us to gather insights about what approaches are most promising to stimulate the commercial retail building energy retrofit market and really "go to scale" (i.e., a *significant steady* increase in the amount of capital – particularly private capital – being devoted to building retrofits as part of an evolving self-sustaining market over time) to achieve "deep" retrofits (a minimum of 30% energy reduction, building operations and technologies, over time). As part of that, the foundations want to know what the priority action items are they (and perhaps other market participants) can help with.

(***If not familiar with foundations…***) As background, if you're not familiar with them philanthropic foundations generally fund only non-profits for activities such as policy advocacy, research, convening various stakeholders to share experiences, etc. with the aim of bettering the world in some way.

There will be no attribution in the report – just a list at the back of everyone we spoke with.

1. What do you think the top / most promising approaches are for going deep at scale with commercial retail building retrofits? As an expert, what do you think it takes to scale up retrofits?

2. If you had $10 million to allocate to really make a meaningful difference on this, how/where would you spend it?

3. The foundations convened an expert roundtable this summer to begin exploring these issues. That roundtable came up with a list of 3 top things foundations could do in this area. What do you think about these approaches for foundations? Are they also promising? Any notable problems with them?

- Supporting development of incentives and better data, including mandatory benchmarking at a state or regional level, the creation of regional competitions (e.g., using EPA Portfolio Manager and working with the International Council of Shopping Centers), and the creation of a database with energy consumption and finance information.

- Funding multi-stakeholder partnerships, including multi-stakeholder collaboration across the supply chain to commit to goals and identify opportunities, sending senior fellows from non-profits (or elsewhere) to a site to actively problem-solve and engage with C-suite executives, and doing an analysis and case studies of success stories that highlight the business case for retrofits.

- Supporting a "Main Street challenge" like the Better Buildings Initiative but focused on smaller owners and retailers, including setting up one-stop shops for all retrofit information and needs.

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4. Are there particular people or organizations in the commercial retail market (whether private sector, government, or other) who are good candidates to play an active role in promoting or administering the implementation of these most promising approaches?

5. Are there particular geographic markets or cities that are well positioned to initiate or further pursue a proactive effort to build the market for commercial retail retrofits? Are there any that seem promising as a place to test particular interventions?

(If there's extra time…)

6. What do you think the top / most pressing research needs are for going deep at scale with commercial retail building retrofits?

7. What do you think about these research needs?

- Understanding and developing a playbook on how to integrate different pools of capital (utility, federal, state, community development funds, etc.).
- Detailed case studies on success stories, documenting who has done retrofits, why, how it got internal approval, what was done, how it was financed, and what the results were.
- Better understanding the motivations and benefits for retailers, owners, customers; how to reach them with a retrofit program; the impacts of retrofits on sales, employee health, property value, etc.; and how to work with appraisers on appreciating the value of retrofits.

8. If the foundations conduct research projects or fund pilot programs, what do you advise be done with its documentation to provide a benefit to a wider audience? How does the information do something besides sit on a shelf (or in an inbox)?

9. What are the greatest barriers to going "deep" at "scale"? What have been some of the greatest mis-steps?

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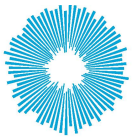

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