Opportunities for Developing the Building Retrofit Industry and Market (BRIM)

Interim Report
February 1, 2011

Project Team:

John Cleveland and Pete Plastrik, INC (Innovation Network for Communities)
Joel Rogers, COWS (Center on Wisconsin Strategy)
Chinwe Onyeagoro, O-H Community Partners

Project Funders:

The Kresge Foundation
The Rockefeller Foundation

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A Note About Supporting Report Documents

This document is the Interim Report for the BRIM Development Project. A final report will be issued by April 1, 2011.

There are two important supporting documents for this report:

- A set of 102 PowerPoint slides that were used to present the report recommendations to philanthropic funders at a December 13, 2011 meeting at the Rockefeller Foundation in New York City.

- A support report with profiles of 78 organizations that provide Technical Assistance to the BRIM market.

Electronic versions of all three of these files can be downloaded from the Innovation Network for Communities web site at: http://usa.nupolis.com/public/item/264245

SECTION ONE – EXECUTIVE SUMMARY

The Building Retrofit Industry and Market Development Project (BRIM-DP) was launched to inform philanthropic investment in activity around building energy retrofits (i.e., the application energy efficient or clean generation measures to existing building stock). Among relevant funders, these investments had almost always been undertaken to further, *via* the underlying retrofit work, the ultimate goals of GHG emissions reductions, poverty alleviation, or more socially inclusive and equitable economic development. But those making them recognized that scale and sustainability in achieving such ultimate goals required a large intermediate one, viz. a self-sustaining market, and associated high-road industry, for the work itself. BRIM-DP sought to find out what sorts of philanthropic investments might further that goal.

To find out, the project team (INC, COWS, and OH-CP) conducted interviews with key BRIM participants and analyzed the current state of technical assistance (TA) and other supports to the industry. More work is needed, which is why this report is only interim, but we have done enough to offer some recommendations and suggestions for implementing them. This report provides further background and motivation on BRIM-DP, and summarizes those recommendations and suggestions.

We find ample opportunity for philanthropy to help in BRIM's development. As a whole, if not in all its parts, BRIM is at a very early stage of market development. It lacks the typical attributes of self-sustaining markets and industries, including: robust customer demand for products; standards in those products' provision; established paths for the research, development, and commercialization of new practices; and other institutional infrastructure, including industry associations, that contribute to industry governance and innovation. Recently, of course, an enormous infusion of public money through the ARRA (American Recovery and Reinvestment Act), along with the aforementioned philanthropic interest, has led to a small explosion of retrofit projects. Current activity in the areas prominently includes much work on project or **program implementation** (i.e., implementation of retrofit programs and strategies in local and regional markets) and a considerable amount of **technical assistance** to support that implementation (i.e., advising implementers on program design, and linking them to other sources of knowledge and support, including their peers). But much less developed, and particularly significant for our purposes, is investment in **market development** (i.e., the knowledge, innovations, standards and institutions that support the development of self-sustaining market transactions, and associated industry innovation and growth).

We see three main opportunities for philanthropy to contribute to BRIM development:

1. Develop a national strategy/framework for investments in BRIM development, with a view to coordination with government and private players.
2. Plan now for a "post-ARRA" TA infrastructure to support implementation and promote general industry learning.
3. Develop structures to promote collaboration, to BRIM development ends, within and across its own ranks, industry stakeholders, and government

Recommendation One: Develop a National Strategy/Framework for Investing in BRIM Development, With a View to Coordination with Government and Private Players

Findings	Recommendations
• Investing in market development is a specialized activity • The BRIM is at a very early stage of development • BRIM has several distinct sub-segments that need to be addressed differently • Significant investments have been made in key aspects of market development • There are many promising market development opportunities • Market development investments are not well coordinated	1. *Agree on a framework for BRIM development investments and systematically catalogue current initiatives and investments (funders; feds; private).* 2. *Create a three way partnership between USDOE , funders and market players to collaborate on market development investments.* 3. *Develop a network infrastructure to support collaboration and project execution on market investments over the long term.* 4. *Hold an annual BRIM Development conference.*

Recommendation Two – Plan Now For A "Post-ARRA" TA Infrastructure To Support Implementation And Promote General Industry Learning

Findings	Recommendations
• There is a wide diversity of players already active in the BRIM Technical Assistance market. • USDOE is investing $20+ million in a national BRIM infrastructure • USDOE Technical Assistance Program (TAP) funding is temporary; most funding ends by CY 2012 • The current TAP is heavily focused on managing transactions; design of a knowledge management system is not yet apparent • The process for quality control is not transparent	*1. Build on the base created by the USDOE TAP initiative.* *2. Start now to plan for a post-ARRA TA infrastructure.* *3. Make sure that structure has a "learning system" that rapidly disseminates knowledge across players and markets; and use this system to inform market development investments.* *4. Develop robust feedback loops and a continuous improvement process.*

Recommendation Three: Develop Structures To Promote Collaboration, To BRIM Development Ends, Within And Across Philanthropy, Industry Stakeholders, And Government

Findings	Recommendations

• USDOE investments are leading BRIM development, but many other players are also playing important roles.
• Two kinds of collaboration structures could help advance the field:
  • A structure for formal collaboration between funders
  • A vehicle for USDOE to interact with key players in the field, outside of program implementation relationships.
	1. Formalize collaboration across funders through a Working Group structure.
	2. Explore the best way to organize market stakeholders in ways that can align strategies for market development.
	3. Develop MOUs or other structures for collaboration between USDOE and both the Funders Working Group and market stakeholders.

We recommend the following next steps, respectively, for these recommendations:

Developing an investment strategy/framework

1. Identify which funders are interested in working on this issue in a structured way
2. Conduct the next level of inventory on market-building projects:
   - List of projects by relevant categories
   - Develop standard profile for each project
   - Develop database format for sharing
   - Conduct a high level assessment of the strategy within each niche, using "investment advisors" where appropriate
3. Meet to review results and plan next steps.

Preparing for post-ARRA TA

1. Identify key players to provide input to USDOE post-ARRA TA planning.
2. Develop a Funders Working Group assessment of current and planned foundation investments in TA capacity.
3. Hold a meeting in the February time frame with DOE; funders; and key field networks on future TA infrastructure.

Developing structures for collaboration

1. Formalize a Funders BRIM Working Group:
   - Members
   - Mission
   - Facilitation and analysis support
   - Meeting schedule
   - Priorities

2. Convene a meeting of key market stakeholders to explore how best to organize the field for collaborative interaction (after next level of market building investments has been completed) and to review priorities for BRIM development.

Section Two – Project Background

The BRIM Development project evolved from discussions between philanthropic funders and others about the need for a more deliberate and strategic approach to investments design to support the creation of a robust and self-driving market for building energy efficiency retrofits across all building segments.

Long-term, the building performance improvement sector need a robust collaborative R&D infrastructure that builds the market institutions, standards and relationships that mature, efficient and competitive markets require. This sector is at an early stage of development and lacks much of this infrastructure. Work on understanding the technical assistance resources and peer learning networks for the sector should build towards a broader strategy to build these market-enhancing structures.

The key deliverables for the project include the following:

- Scan major providers of technical assistance (TA) for the building energy efficiency retrofit industry (including all building types, i.e., single- and multi-family residential, commercial/industrial, public/institutional);

- Identify salient problems in the present Technical Assistance system (quality, coverage gaps, inefficiencies in provision) and recommend steps toward their solution;

- Identify the requirements of an applied R&D and innovation infrastructure for the industry and recommend steps in its design and construction;

- Facilitate a meeting among relevant industry, government, and private non-profit actors sector to consider these findings and recommendations.

The project team includes four principals:

- John Cleveland and Pete Plastrik from the Innovation Network for Communities (INC).
- Joel Rogers from COWS (Center on Wisconsin Strategy).
- Chinwe Onyeagoro, from O-H Community Partners.

Funding for the project was provided by the Kresge and Rockefeller Foundations.

The key steps in developing this interim report included the following:

- **Interviews.** The team conducted one-on-one interviews with 27 individuals involved in the retrofit market at the national and local levels. (See Attachment 1 for a list of the individuals interviewed.)

- **Secondary Research and Profiles.** The team identified 156 potential providers of building retrofit technical assistance and program implementation support. These players were segmented based on several factors, including type of organization; geographic scope; size; and service offerings. Individual profiles were developed for 78 of these players.

- **Interim Findings Memo.** In September, 2010, an memorandum summarizing the interim findings of the research was circulated for feedback from funders, USDOE staff and others.

- **BetterBuilding Grantee Meeting.** On October 21, 2010, the BRIM Development Project Team convened over 30 people representing 19 BetterBuilding grantee sites to explore opportunities for collaboration across sites.

- **Meeting With USDOE Staff.** A meeting was held in Washington, DC on November 29 with staff of the BetterBuildings Program and the USDOE Technical Assistance Program.

- **Funder Meeting and Presentation.** On December 13, a meeting of representatives from 15 foundations involved in building retrofit grant making, Living Cities, and the USDOE was convened to share the key project findings.[1]

The following additional research is in process and will support the development of the final project report:

- Additional interviews with key stakeholders not adequately represented in the first round of interviews, including representatives from the utility industry; ESCO industry; and private banking.

- Development of a more complete list of active BRIM market development investments from foundations, the federal government, local players, NGOs, and private industry.

- Profiles for a key subset of these market development projects.

[1] A copy of the 102 page PowerPoint presentation used at that meeting can be downloaded from: www.nupolis.com.

Section Three – Framing the Building Retrofit Opportunity

For purposes of this analysis, energy efficiency building retrofits are defined as:

> *"The retrofitting of existing buildings to reduce overall energy consumption and shift energy consumption to renewable energy sources."*

As numerous other reports and analyses have noted, the development of a robust energy efficiency building retrofit market in the U.S. represents a significant environmental and economic opportunity:

- Building stocks account for 40% of all U.S. energy consumption, and 72% of total electrical consumption.
- Buildings account for 38% of national carbon emissions.
- It costs $400 billion a year to heat and cool the U.S. building stock.

By improving the energy efficiency and renewable energy content of the U.S. building stock, we can:

- Significantly reduce greenhouse gas emissions
- Reduce the cost of heating and cooling for building owners and tenants
- Create tens of thousands of new construction and related jobs

<u>BRIM Has At Least Five Distinct Market Sub-Segments</u>

There are at least five sub-markets within the overall building retrofit market. The five segments include:

- Single family residential homes (both owner occupied and rental)
- Multi-family buildings
- Small commercial/industrial (generally under 75,000 sq ft of space)
- Large commercial/industrial
- The "MUSH" market (Municipal, University, Schools, Hospitals)

Each of these sub-segments has its own owners, economics, patterns of energy use, market drivers and regulatory structures. These market differences need to be taken into account when developing market-building strategies.

<u>Framing the Challenge of Building the BRIM Market</u>

There are three kinds of work that support the development of the BRIM market. They are all important, and various players are investing in each one:

- **Program Implementation** – Implementation of retrofit programs and strategies in local and regional markets.

- **Technical Assistance** – Advising implementers on program design, and linking them to other sources of knowledge and support, including their peers.

- **Market** Development – Investing in knowledge, innovations, standards and institutions that support the development of self-sustaining market transactions.

The goal of these three strategies is ultimately to develop a robust self-organizing market for building retrofit transactions. In other words, the real work is about **developing a market**, not implementing programs. The development of a robust self-organizing market will ultimately determine whether or not the retrofitting of buildings can make a significant contribution to energy independence, greenhouse gas reduction and equitable sustainable development.

Program implementation can play an important role in helping to develop a market, by jump-starting demand; creating confidence about market transactions; developing market standards; and creating confidence for private players to enter the market. But it needs to be complemented with investments in a market infrastructure.

There are four main ways to invest in the development of market infrastructure. These include:

Strategy	Description
Knowledge Creation	Research on market dynamics; core technologies; best practices; benchmarking; etc.
Innovation	Development of new products, services, technologies that advance the market.
Standards	Creation of policy requirements & industry standards that enable consumer protection; fair trade; social equity; quality standards; environmental protection; etc.
Institutions and Structures	Organizations, trade associations, networks and other vehicles for organizing players for collaboration within the market.

There is a long history of philanthropy, federal and state governments and other socially-motivated players investing in the development of specific markets. These have included agriculture, manufacturing modernization, public choice in education, affordable housing, sustainable forestry and others. In each case, these have required several decades of intensive investment coordinated over a broad range of market players.

<u>BRIM Is At a Very Early Stage of Development</u>

Many segments of the building energy efficiency retrofit market (also often referred to as the “building performance improvement market”) are very early in their development (you might even say that it is in “pre-development”). Robust markets are characterized

by most of the following:

A Customer Need and Value Proposition that Generates Strong Demand

- Good consumer information about the product/service
- Perceived customer need for the product/service
- Consumer confidence in product/service performance
- Clear performance measurements
- Ability to pay and payment systems that enable convenient and secure transactions

An Industry Value Chain that Can Provide Quality Products and Services on a Reliable Basis, and Support Continuous Improvement

- Consistent industry standards that govern market transactions and create "transaction confidence" in the market
- Industry and trade associations that collaborate on industry development
- Professional associations that advance professional standards and development
- Occupational credentialing and certification systems to support talent supply chain
- Well developed supply chains and OEM-supplier standards and relationships
- An R&D infrastructure that supports continuous innovation

Many of these elements of the building retrofit market are very early in development, or do not yet exist. The ability to develop a robust self-organizing market has, fundamentally, not yet been proven out. Specific retrofit market barriers include the following:

- Consumers have not been convinced that the benefits outweigh the costs of the transaction
- There are no standardized measurements to quantify energy savings
- The value of energy efficiency is not recognized in the appraisal of market value
- Getting financing for energy efficiency can be complicated and expensive
- The "hassle factor" in getting a retrofit done is very high and can involve management of several independent contractors and extensive disruption to the home.
- For many building sectors, the margins to contractors are low, and do not cover the costs of a complex sales process.

Part of this reality is that many of the motivations for developing this market have nothing to do with the customer value proposition. Instead, they are about the ancillary and aggregated benefits (such as reducing energy use; reducing greenhouse gas emissions; creating new jobs; etc.) of retrofits. The difficulty, of course, is that you don't

get any of these ancillary benefits if customers aren't convinced of the value proposition. If the value proposition is not compelling in and of itself (or can't be designed to be compelling), the focus of behavior change needs to shift from private market transactions to stronger policy incentives (subsidies or penalties) that support and enhance market transactions.

Section Four – Recommendations on BRIM Market Development

Summary of BRIM Market Development Findings and Recommendations

Key Findings

- *There are many promising opportunities for investing in BRIM development – and a reasonable level of consensus on the priorities*
- *There is no "silver bullet" strategy available – it requires many investments in many facets of the market*
- *The investments need to be coordinated with each other to maximize learning and adaptive capacity*
- *Each area of investment is complex in its own right – managing the complexity across multiple domains is quite challenging, but not impossible*
- *Different players have different areas of expertise; it is important to differentiate and specialize*
- *In the absence of strong industry institutions, some kind of network structure will probably be needed to coordinate investments*

Recommendations

1. *Agree on a framework for BRIM development investments and systematically catalogue current initiatives and investments (funders; feds; private).*
2. *Create a three-way partnership between USDOE , funders and market players to collaborate on market development investments.*
3. *Develop a network infrastructure to support collaboration and project execution on market investments over the long term.*
4. *Hold an annual BRIM Development conference.*

The BRIM project team identified a broad range of opportunities for investing in the development of the BRIM market. These are summarized in the tables below.

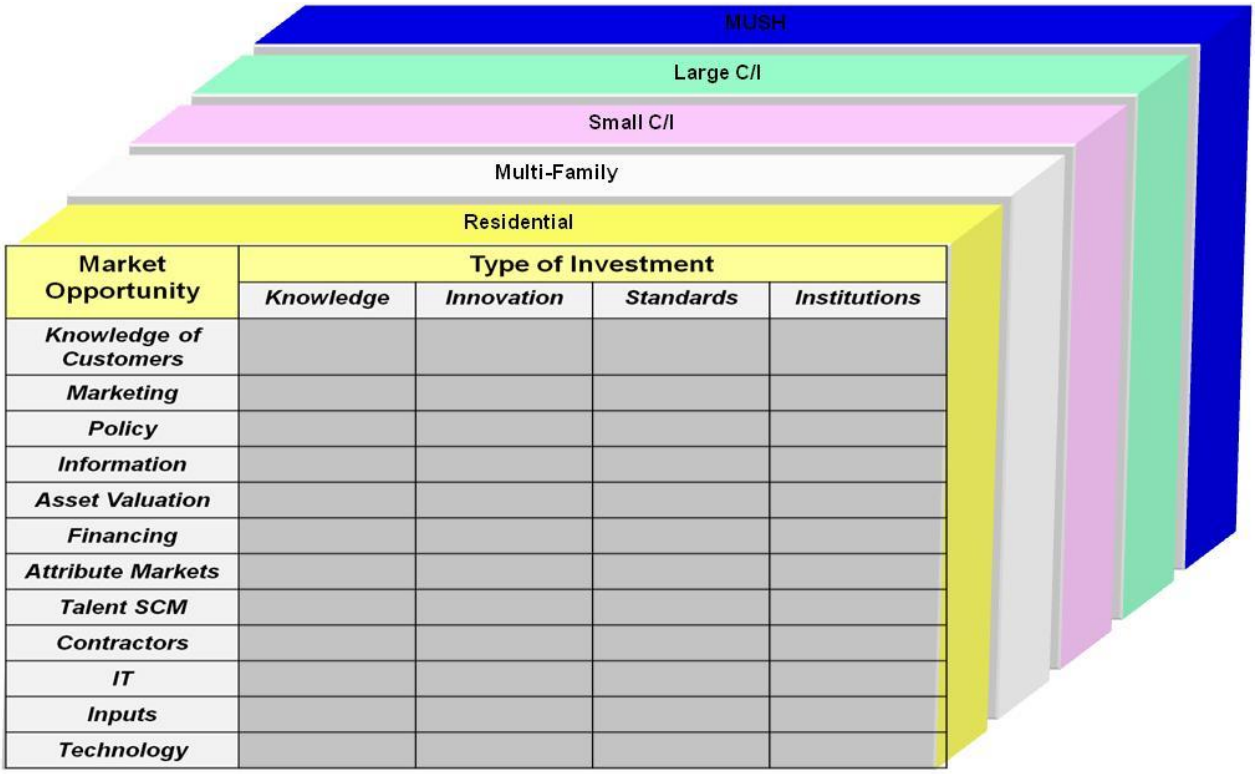
Market Problem	Development Opportunity
Knowledge of Customers	• Standard definitions of market segments • Longitudinal consumer research on perceptions of the value proposition
Effective Marketing	• Development of common messages and marketing strategies by segment • Consistent branding of the value proposition for customers
Policy Incentives	• Research on impact of specific policy incentives on customer behavior by segment
Information	• Energy management tools • Energy scoring platforms & building rating systems • National utility data sharing agreements • National energy use databases • Standardized monitoring and verification protocols
Asset Valuation	• Building industry comparables for EE buildings and changing appraisal methodology
Financing	• Industry accepted underwriting standards • Alternative financing business models • Secondary market development • Leveraging utility system benefit charges
Attribute Market Access	• Standards for carbon credit & offset certification • Standards on ownership of carbon credits • Standards for inclusion in forward capacity markets
Talent Supply Chains	• Occupational credentialing and certification systems • Standardized education and training curricula • Labor demand forecasting systems
Contractor Quality	• Contractor certification systems • Contractor development systems • Contractor business tools
Information Technology	• Enterprise Resource Planning (ERP) systems for integrated management of customer transactions • Data and software interoperability standards
Input Costs	• Material and components joint purchasing
Building Technology	• Applied R&D in new building energy efficiency technologies

These opportunities can be further segmented by:

- The type of market development opportunity they represent (e.g. Knowledge Creation; Innovation; Standards; Institutions)

- The sector they apply to (e.g. single family; multi-family, commercial/industrial; MUSH)

An integrated national market development strategy would create a “portfolio” of investments for each content area designed to create scalable market solutions in that specific area. The graphic below represents what such an integrated strategy might look like.



Market Opportunity	Type of Investment			
	Knowledge	*Innovation*	*Standards*	*Institutions*
Knowledge of Customers				
Marketing				
Policy				
Information				
Asset Valuation				
Financing				
Attribute Markets				
Talent SCM				
Contractors				
IT				
Inputs				
Technology				

Examples of Current Investments in BRIM Development

A combination of the federal government; local initiatives; foundations; and private players have already launched or are planning some promising investments in different initiatives to build a market infrastructure for the building retrofit market. The list of initiatives the BRIM Project team was able to develop is incomplete, and part of the next phase of the work plan is to flesh this out in greater detail, and also develop up to date profiles on a subset of key initiatives so it is possible to understand exactly what it is that they are trying to do.

The graphic below summarizes where a sampling of these initiatives fall on the opportunity matrix."

Market Opportunity	Market Segment			
	Residential	Multi-family	C/I	MUSH
Customers	LBL Driving Demand Research			
Marketing				
Policy				
Information	Residential Home Scoring System		Commercial Bldg Rating System; EPA Portfolio Manager	
Asset Valuation	EE Comparables Network			
Financing	HUD Title I "Power Saver" Program	DBA Foundation Multi Family Database		
Attribute Mkts				
Talent SCM	Residential Retrofit Guidelines			
Contractors				
IT	BPI Home Perf. XML			
Inputs				
Technology	USDOE Building Energy Efficiency Hub; Energy Efficient Homes Partnerships			

A short description of each of these initiatives is provided below.

Lawrence Berkeley Labs "Driving Demand" Research

Merrian Fuller of the Lawrence Berkeley labs led a team that conducted a comprehensive survey of demand generation strategies for the residential retrofit market. The report, "Driving Demand for Home Energy Improvements", establishes the foundation for collaborative development of research; marketing tools; common collateral and other means for building a broader consumer demand-driven market.

USDOE National Residential Home Scoring System

This initiative includes a number of different components, all of which are designed to lead to a standardized national system for measuring and rating the energy performance of homes. These components include:

- A standardized set of metrics for measuring home energy performance
- A labeling system that gives specific homes a "score" and a "label" reflecting that score
- A National Building Performance Registry that serves as a data repository for information from all labeled homes.

A pilot of the scoring system was launched in the fall of 2010 in 10 pilot communities and states, covering the full range of building types and climate environments. The intention is to launch the program on a national basis in the later part of 2011.

USDOE National Commercial Building Rating System

This initiative will create a parallel system of metrics, labels and data repository for commercial buildings. The measurement system will be based on the EPA Portfolio Manager platform.

USDOE National Residential Retrofit Guidelines

This DOE initiative, which was rolled out in July of 2010 seeks to create standard work specifications for retrofit work and then link these to "essential knowledge skills and abilities" which in turn are used to create an industry worker occupational certification architecture that drives the design and content of training and education programming in the private and public sectors. The report "*Workforce Guidelines for Home Energy Upgrades*" summarizes the work of this initiative to date.

USDOE Building Energy Efficiency Hub

DOE has committed over $120 million to an "Energy Innovation Hub" headed up by the University of Pennsylvania to develop new building energy efficiency technology. The mission of the Hub is described in the following fashion:

> *"The mission of this Energy Innovation Hub is to research, develop and demonstrate highly efficient building components, systems, and models which are applicable to both retrofit and new construction. The Hub team will pursue a research, development and demonstration (RD&D) program targeting technologies for single buildings and district-wide systems. These technologies include computer simulation and design tools to enable integrated project teams of architects, engineers, contractors and building operators to work collaboratively on retrofit, renovation and new building design projects; advanced combined heat and power (CHP) systems; building-integrated photovoltaic systems for energy generation; advanced HVAC systems with integrated indoor air quality management; and sensor and control networks to monitor building conditions and optimize energy use. The RD&D program will also incorporate a systematic analysis of the role of policy, markets and behavior in driving the adoption and use of energy technologies in buildings."*

USDOE Residential Retrofit Technology Development

As part of the Building America program, DOE has invested $30 million in 15 applied R&D "Energy Efficient Homes Partnerships" to develop building technologies that can be used for energy efficiency retrofits. These "technologies" (some are hard technologies and some are operating systems) cover a broad range of content,

including:

- Manufactured homes and system-built housing solutions
- Specific applications for different climates (hot and humid; cold; hot and dry; etc.
- Audit tools and technology
- Advanced energy controls for residential buildings
- Residential renewable energy technologies

These investments are intended to extend the focus of the Building America program on existing as well as new homes.

HUD Title I Power Savers Loan Guarantees

The Department of Housing and Urban Development is launching a two year pilot of its Power Savers loan guarantee program in 2011. The features of the program include the following:

- Covers loans for up to $25,000 of home improvements
- 90% insurance coverage for lenders; maximum of 10% of portfolio
- Creates effective loan loss reserve fund of 9% for qualified lenders
- Targeted at communities with retrofit initiatives; Better Building communities automatically eligible
- FHA is working with Ginnie Mae to develop secondary market options

BPI Home Performance XML Standards

The Building Performance Institute has development a set of XML (Extensible Markup Language) standards to allow easy management and transferability of data related to home performance improvements. open data collection and reporting tool that can be used by all sectors of the growing home performance industry to easily exchange information online.

The Home Performance Extensible Markup Language (HPXML) data schema was developed by BPI with US Environmental Protection Agency (EPA) funding. HPXML is based on exchange capability in use by thousands of contractors in New York state programs and is currently used in the EPA-sponsored Northern Virginia Home Performance with ENERGY STAR® program. The HPXML schema is available in its current form for use by any person or organization through a public BPI-sponsored web site, www.homeperformancexml.org.

Deutsche Bank Americas Foundation Energy Efficiency Database

The DBA Foundation has supported a project to create a database of 100 New York City multifamily properties that will allow an evaluation of energy and cost savings due to the implementation of efficiency measures. The database will be used to inform bank underwriting standards. The project has four phases:

- Aggregate the building-specific data
- Analyze projected vs. actual performance
- Develop underwriting guidelines
- Develop a tracking process to track performance over time

Center for Neighborhood Technology Green MLS 2.0

Motivation to invest in retrofits is limited in part because the value of retrofits is rarely reflected in the market value of a home. The way the system works now, it's much easier today to increase the appraised value of a house by rehabbing a kitchen or bathroom than by making energy efficiency improvements. Without the promise of improved value, it is difficult for individuals to justify higher upfront costs of energy efficient remodeling. The real estate market needs a system that accurately measures the value of energy efficiency improvements and allows for them to be systematically compared with other homes with similar levels of energy efficiency improvements (e.g. comparables), so the market can value it correctly.

The Center for Neighborhood Technology Green MLS 2.0 initiative is forming a network of BetterBuilding sites to develop a system and methodology for integrating energy efficiency information into the Multiple Listing Service (MLS) and property appraisal systems. The project will have five phases:

1. Create dialogue and partnership between selected BetterBuildings grantees, the MLS staff that serve that market area (MLS technology platform), and local REALTOR association (MLS users) in the area.
2. Facilitate a Learning Network to accelerate availability of retrofit comparables in key markets.
3. Design BetterBuildings/MLS interface with process steps that insure reliability of retrofit claims.
4. Educate local appraisal community on availability of retrofit comps.
5. Design a reporting process to track trends in local retrofit sales.

Recommended BRIM Development Action Steps

This is an excellent beginning portfolio for market development investments. The next challenge, however, is to evolve from an interesting set of projects into an effective collaborative R&D infrastructure for the industry – supported by a coordinated national strategy that is shared across government, private and non-profit investor networks.

The BRIM Project Team makes the following recommendations to move to this next level of strategy:

1. *Agree on a framework for BRIM development investments and systematically catalogue current initiatives and investments (funders; feds; private).*

Collaboration on a long-term investment strategy will require a common language and framework to communicate across multiple investment venues. The framework the BRIM Project Team has developed is a start in this direction, but requires substantial enhancement and higher levels of detail to serve this purpose effectively.

2. *Create a three-way partnership between USDOE , funders and market players to collaborate on market development investments.*

   A partnership needs to be created between key government players (USDOE; EPA; and some local investors), foundations who are investing in this space, key non-profit market players, and private investors so that investments can be effectively coordinated. We do not envision this as needed to be a formal set of relationships, but rather a loose "alignment network" that allows the players to effectively communicate with each other and collaborate as needed in ways that increase the effectiveness of each investment.

3. *Develop a network infrastructure to support collaboration and project execution on market investments over the long term.*

   As noted in Recommendation #2, above, a network is probably the best organizational form for this kind of investment collaboration. We recommend that a BRIM Market Development Investor Network be created to support this purpose. The functions of the network would be to:

   - Evolve the BRIM market development framework, including updating the key market barriers and investment opportunities.
   - Populating a database of with profiles of key market development investment projects, so all network members understand the work that is in process.
   - Collaboratively assessing the current portfolio in key market development niches (such as finance; asset valuation; information systems; market demand; etc.) and identifying gaps and opportunities.
   - Facilitating collaborative R&D investments between network members.
   - Sponsoring and supporting the annual BRIM Development Conference.

4. *Hold an annual BRIM Development conference.*

   An annual BRIM Development Conference would be an opportunity to annually assess the evolution of the market (with market research presentations); present completed work and work in process; an identify new investment opportunities.

Section Five – Recommendations on BRIM Technical Assistance Infrastructure

Summary of BRIM Technical Assistance Findings and Recommendations

Key Findings

- There is a wide diversity of players already active in the BRIM Technical Assistance market.
- USDOE is investing $20+ million in a national BRIM infrastructure
- USDOE Technical Assistance Program (TAP) funding is temporary; most funding ends by CY 2012
- The current TAP is heavily focused on managing transactions; design of a knowledge management system is not yet apparent
- The process for quality control is not transparent

Recommendations

1. *Build on the base created by the USDOE TAP initiative.*
2. *Start now to plan for a post-ARRA TA infrastructure.*
3. *Make sure that structure has a "learning system" that rapidly disseminates knowledge across players and markets; and use this system to inform market development investments.*
4. *Develop robust feedback loops and a continuous improvement process.*

Analysis and Segmentation of Technical Assistance Players

The BRIM Project Team conducted an analysis of the key players in the BRIM Technical Assistance market. The first phase of research focused on identifying existing technical assistance providers in the building retrofit market. For this purpose, the market was segmented in the following ways:

- *Geographic scope:* regional and national organizations
- *Entity type:* for-profit, not-for-profit, government, and public private partnership
- *Service offering:* Provide direct or indirect technical assistance services to support the capacity building of building retrofit providers and professionals as well as to enable the delivery of building retrofits, including marketing, planning, design, implementation, and evaluation

This market definition excluded organizations that focus on a single city or state as well as those organizations that serve exclusively as building retrofit program operators and/or delivery institutions.

The list of building retrofit TA market participants was assembled from a variety of sources, including:

- U.S. Department of Energy (DOE) Technical Assistance Provider (TAP) Network
- Innovation Network for Communities (INC) database
- DOE Energy Efficiency Partnership for Homes directory
- GuideStar, national database of tax-exempt entities
- Hoovers, national database of public traded companies
- Capital IQ, national database of public and private companies
- LexisNexis
- Public literature scan, using targeted key word searches

After completing preliminary research on existing TA providers, a taxonomy was created to define the market structure. The Building Retrofit TA market was organized by entity type, building type, and technical assistance service type. All 156 TA providers identified were classified using information from each organization's website as well as their GuideStar, CapitalIQ and/or Dun & Bradstreet profiles, if available.

The next phase of research focused on conducting secondary analysis on key Building Retrofit TA providers within the market. Detailed organizational profiles were created for each provider, which included the following information:

- name of the organization
- website address
- geographic scope
- mission
- year established
- staff size
- expertise
- products / programs / services
- key relationships

As part of the secondary analysis, 78 (~50% of the total) organizations were profiled. These organizations were selected based on their relationships with key funders/government agencies, size and influence of their network/client portfolio, and recognized brand name. These organizations were also cross-referenced to the USDOE Technical Assistance Program. **A list of these organizations is provided in Attachment 1. In addition, the full set of organizational profiles can be downloaded from the Innovation Network for Communities web site at: .**

Summary of Market Research Findings

The building retrofit technical assistance market is currently comprised of a balanced mix of for-profit and not-for-profit organizations, along with a handful of government and public private partnership entities. The vast majority of organizations profiled have been funded using American Recovery and Reinvestment Act funding, in whole, or in part by

federal government agencies, including U.S. Department of Energy and the Environmental Protection Agency. These organizations include:

- DOE Energy Efficient Housing Partnership Grantees ($30 million)
- DOE TAP Network Providers ($20 million)
- Environmental Finance Center Network Universities ($24 million)
- Federal Government Research Laboratories (i.e., Lawrence Berkeley National Laboratories, National Renewable Energy Laboratories, Oak Ridge National Laboratories)

The building retrofit TA market is evenly split between not-for-profit (48%) and for-profit organizations (42%). However, not-for-profit providers primarily tend to be 501(c)(3)/civic organizations (53%) and industry trade associations (35%) while for profit organizations are overwhelmingly management consulting firms (70%).

The focus and capacity of the technical assistance providers in this market varies widely. Most organizations provide assistance in multiple technical assistance service areas. The most common categories of technical assistance offered are: (i) retrofit program design (49% of all organizations offered this type of TA), (ii) building testing assessment and certification (43%), (iii) financing (38%), and (iv & v) retrofit program management/ retrofit program performance evaluation (34%). The categories for which there is the least assistance are job standards / targeted hiring & contracting (7%) followed by workforce training and preparation (15%).

When reviewing the 78 secondary analysis profiles:

- The top 5 TA service areas are roughly the same with (i) retrofit program design (47%), (ii) financing (41%), (iii) building testing assessment and certification (39%), (iv) retrofit program performance evaluation (34%), and (v) retrofit program management (30%)
- The market has grown quickly over the past two decades, with 35% of providers established between 2000 and 2010 and another 25% between 1990 and 1999.
- Organizational capacity is still limited as 24% of these organizations have less than 10 full-time employees, 39% have less than 20, and 59% have less than 50. Only 5% of providers have staff of 500+, none of which include not-for-profit organizations.
- Geographic focus: Most organizations (88%) are national in scope; however, based on low staffing levels and lack of distributed office facilities it is likely that these organizations are limited to serving multiple regions (at any given time) rather than the entire country.

<u>High Level TA Provider Taxonomy</u>

At a very high level, the technical assistance providers fall into a number of different categories. These are summarized in the table below.

Type of Organization	Examples
National integrated service providers.	Conservation Services Group; Honeywell; ICF; Sentech; Vermont Energy Investment Corporation
Regional integrated service providers.	Center for Neighborhood Technology; Southface; Strategic Energy Innovations
National players with a focused content area.	Ballard Spahr; Partnership for Working Families; Renewable Funding
Regional players with a focused content area.	Environmental Finance Center Network *(1 university per region – 10 total);* Shorebank Enterprise Cascadia
National membership organizations and networks.	ACEEE, Emerald Cities; Energy Services Coalition; ICLEI; Urban Sustainability Directors Network
Regional membership organizations and networks.	Midwest Energy Efficiency Alliance; Northeast Energy Efficiency Partnership; Northwest Energy Efficiency Alliance; Southwest Energy Efficiency Project
National industry/trade associations.	Efficiency First; National Home Performance Council; Building Performance Institute; USGBC

USDOE Technical Assistance Program (TAP)

In 20009, the US Department of Energy implemented a national Technical Assistance Program (TAP), funded under the Energy Efficiency and Conservation Block Grant (EECBG) program. The TAP program is administered by the Weatherization and Intergovernmental Programs division within the Energy Efficiency and Renewable Energy (EERE) section of USDOE.

The key features of the USDOE TAP program are summarized below:[2]

- Over $20 million in funding is committed over three years.
- Targeted customers include all 3,000+ EECBG recipients.
- The program is supported by a Technical Assistance Center that includes a call center, on-line customer service center and Solutions web site.
- The TA provider network includes over 200 individuals from over 45 organizations.

[2] Additional detail on the TAP initiative is included in the supplemental PowerPoint presentation to this interim report. See Page 2 of this report for the web site for download information.

- The provider network is broken into four teams, each addressing a slightly different content area:
    - A **performance contracting** team focused on Energy Performance Contracting for commercial/industrial buildings.
    - A **financing mechanisms** team focused on solutions to flow capital to energy efficiency projects.
    - A **program design and implementation** team focused on supporting local sites in the design and launch of their initiatives.
    - A **DOE labs** team that provides access to 50 experts at the National Renewable Energy (NREL) lab; Lawrence Berkeley National Lab; Oak Ridge National Lab; and Pacific Northwest National Lab.
- The network is coordinated regionally by a set of Regional Coordinators that serve as the first point of contact for users.
- The TAP uses a TA request process flow to screen and respond to requests for assistance.

In addition to the TAP, there is a technical assistance infrastructure for the BetterBuilding grantees that consists of a set of Collaborative Working Groups and Affinity Groups. These groups draw heavily on the TAP provider network for technical support.

The USDEO TAP program represents a major investment in a technical assistance infrastructure for the BRIM market. However, this a temporary infrastructure that is unlikely to continue past its current funding. The majority of the USDOE TAP funds are expected to be expended by the end of CY 2011, and it is unlikely that it will be refunded at any significant level. As a result, the USDOE is beginning now to plan for the "post TAP" technical assistance structure.

<u>Recommendations on BRIM Technical Assistance</u>

1. *Build on the base created by the USDOE TAP initiative.*

   The infrastructure and sets of relationships created by the USDOE TAP is a good base to work from. It has created networks, expertise and business processes that did not exit previously. The key now will be to figure out how important elements of this infrastructure can be preserved in a more open market environment after the federal funding ends.

2. *Start now to plan for a post-ARRA TA infrastructure.*

   This is the right time to start planning for the TA design after the federal funding ends. Philanthropic funders have a core interest in this design, since it involves many of their grantees – who have been receiving a lot of core funding from federal sources that are scheduled to end.

3. *Make sure that structure has a "learning system" that rapidly disseminates knowledge across players and markets; and use this system to inform market development investments.*

   The structure has been heavily focused on one-on-one transactions – in many ways as a matter of necessity borne out of the need to respond to a high volume of request in a very short time frame. However, the TAP structure, if properly managed, should be a significant source of learning and insight about barriers to market development and could inform a national market development investment strategy. This will require deliberate design of a "learning system" and disciplined knowledge management to inform national strategy.

4. *Develop robust feedback loops and a continuous improvement process.*

   Finally, as a matter of simple good management, the future TA infrastructure needs a robust and disciplined process for quality feedback from users that fits into a continuous improvement process to make changes in its design.

Section Six – Recommendations on BRIM Collaboration Structures

Because the building retrofit market is at a very early stage of development, the structures for strategic collaboration at the industry level that one finds in more mature markets are not yet developed. As a result, there is not yet strong strategic alignment across key stakeholders on the strategies for development of the market. There are many different players doing many innovative things, but without a shared strategy. We believe that modest investment in collaboration structures can help accelerate this process.

The good news is that some of this infrastructure is already starting to emerge. There are several strong national organizations now that represent key segments of the market; the federal players like USDOE and EPA are getting more strategic about their investments in market development; and there is an emerging network of philanthropic funders that are investing for the long term in BRIM Development.

The BRIM Project Team believes that there are three promising collaboration opportunities that could support and accelerate this momentum:

1. *Formalize collaboration across funders through a Working Group structure.*

   There is a very strong network of philanthropic funders who have made significant investments in BRIM development across all three categories – program implementation; technical assistance; and market development. There are strong relationships and networks between these organizations. The BRIM Project Team believes that a more formalized Working Group structure would help enable strategic collaboration within this sector.[3]

2. *Explore the best way to organize market stakeholders in ways that can align strategies for market development.*

   The BRIM Project Team recommends convening key market stakeholders (including many of the national NGOs and trade associations) to explore ways for the industry to become more effectively organized to interact among itself, and between the industry and federal and philanthropic market development investors.

3. *Develop MOUs or other structures for collaboration between USDOE and both the Funders Working Group and market stakeholders.*

   The USDOE will continue to be a major investor in BRIM development, across all building segments. The Project Team recommends that formal and informal processes be explored to assure alignment between federal investments and other key investors.

[3] At its January 25, 2010 meeting, the Living Cities Green Economy Working Group, which includes many of these funders, agreed to extend participation to several non-Living Cities members to form the nucleus of such a Working Group.

Section Seven – Recommended Next Steps

The BRIM Project Team recommends the following practical short term steps to begin implementing its recommendations.

Strategy Area	Recommended Next Steps
BRIM Market Development	1. Identify which funders are interested in working on this issue in a structured way 2. Conduct the next level of inventory on market-building projects: • List of projects by relevant categories • Develop standard profile for each project • Develop database format for sharing • Conduct a high level assessment of the strategy within each niche, using "investment advisors" where appropriate 3. Meet to review results and plan next steps.
BRIM Technical Assistance	1. Identify key players to provide input to USDOE post-ARRA TA planning. 2. Develop a Funders Working Group assessment of current and planned foundation investments in TA capacity. 3. Hold a meeting in the February time frame with DOE; funders; and key field networks on future TA infrastructure.
BRIM Collaboration Structures	1. Formalize a Funders BRIM Working Group: • Members • Mission • Facilitation and analysis support • Meeting schedule • Priorities 2. Convene a meeting of key market stakeholders to explore how best to organize the field for collaborative interaction (after next level of market building investments has been completed) and to review priorities for BRIM development.

Attachment 1 – Technical Assistance Organization Profiles

1. Affordable Comfort, Inc.
2. Alliance to Save Energy
3. American Council for an Energy-Efficient Economy*
4. Apprise Inc
5. Ballard Spahr*
6. Blue Springs Energy
7. Bright Power
8. Building America Retrofit Alliance
9. Build it Green
10. Building Performance Institute
11. Catalyst Financial Group, Inc*.
12. Center for Climate Strategies*
13. Center for Neighborhood Technology Energy
14. Change to Win
15. COWS (Center on Wisconsin Strategy)
16. Clean Economy Development Center
17. Clean Energy Advocates, Inc.
18. Clean Energy Solutions, Inc.
19. Clinton Climate Initiative
20. Conservation Services Group
21. Consortium for Advanced Residential Buildings
22. Consortium for Energy Efficiency
23. Economic Development Research Group
24. Efficiency Cities Network
25. Efficiency First
26. Emerald Cities Collaborative
27. Energy Efficiency Finance Corporation*
28. Energy Futures Group*
29. Energy Programs Consortium*
30. Energy Services Coalition*
31. Enterprise Green Communities
32. Environmental Finance Center*
33. EP Systems Group*
34. Fraunhofer Center for Sustainable Energy Systems
35. Green for All
36. Groom Energy
37. HarcourtBrown, LLC
38. ICF Incorporated*
39. ICLEI USA
40. Institute for Building Efficiency (Johnson Controls)
41. Institute for Market Transformation
42. Integrated Building and Construction Solutions
43. Honeywell
44. Laborers' International Union of North America
45. Lawrence Berkeley National Lab*
46. LI Green
47. Living Cities
48. Lockheed Martin*
49. Midwest Energy Efficiency Alliance*
50. National Association of State Energy Offices*
51. National Governors Association*
52. National Renewable Energy Laboratory
53. Natural Resource Defense Council**
54. Next Step Living Inc.
55. Northcross, Hill, & Ach*
56. Northeast Energy Efficiency Partnership*
57. Northwest Energy Efficiency Alliance*
58. Oak Ridge National Laboratory*
59. Partnership for Working Families
60. PSD Consulting (Performance Systems Development)
61. Pike Resarch
62. Policy Link
63. Housing for the Future*
64. Strategic Energy Innovations
65. The Cadmus Group*Public Technology Institute*
66. Recurve
67. Renewable Funding, LLC*
68. Sentech*
69. Shorebank Enterprise Cascadia
70. Southface
71. Southwest Energy Efficiency Project*
73. Stewards of Affordable The DC Project
74. The Jordan Institute
75. University of Delaware Center for Energy & Environmental Policy*
76. Urban Sustainability Directors Network
77. US Green Buildings Council
78. Vermont Energy Investment Corp*

***Organizations that are part of the USDOE Technical Assistance Program provider network**

Attachment 2 – Direct Interview List

Person	Organization
David Bank	Civic Ventures
Colin Bishop	Clean Economy Development Center
Dana Bourland	Enterprise Community Partners
Eric Bloom	Pike Research
John Bracey	Southface
Will Byrne	DC Project
Eric Coffman	Affordable Comfort
Steve Cowell	Conservation Services Group
Cisco Devries	Renewable Funding
Eric Dirnbach	Change to Win
Merrian Fuller	Lawrence Berkeley Lab
Karen Gajewski	City of Philadelphia
David Gershon	Empowerment Institute
Benjamin Goldstein	USDOE
Jeremy Hayes	Green for All
Ben Hecht	Living Cities
James Irwin	Efficiency Cities Network
Grace Kelly	Southface
Jeffrey King	Clean Economy Development Center
Molly Lunn	USDOE
Amy Malik	ICLEI
Dennis Murphey	Kansas City
Julia Parzen	Urban Sustainability Directors Network
Joel Rogers	COWS
Chuck Schwarz	Long Island Green
Arah Shuur	Clinton Climate Initiative
Joel Simon	CAEL

Attachment 3 – Participants in the December 13, 2010 Funders Meeting on the Interim Findings

Name	Affiliation	E mail
Sharon Alpert	Surdna Foundation	salpert@surdna.org
Jessica Boehland	The Kresge Foundation	jeboehland@kresge.org
Margot Brandenburg	Rockefeller Foundation	MBrandenburg@rockfound.org
Amy Brusiloff	Bank of America	amy.brusiloff@bankofamerica.com
Danielle Byrnett	DOE	Danielle.byrnett@doe.gov
Abigail Carlton	Rockefeller Foundation	ACarlton@rockfound.org
John Cleveland	Innovation Network for Communities	john@in4c.net
Kimberlee Cornett	The Kresge Foundation	krcornett@kresge.org
Lois DeBacker	The Kresge Foundation	lrdebacker@kresge.org
Katie Donnelly	Doris Duke Charitable Foundation	kdonnelly@ddcf.org
John Goldstein	Imprint Capital Advisors	John.goldstein@gmail.com
Ben Hecht	Living Cities	bhecht@livingcities.org
Cuong P. Hoang	Chorus Foundation	cphoang@mottphilanthropic.com
Diane Ives	Kendeda Fund	dives@igc.org
Wendy Jackson	The Kresge Foundation	wljackson@kresge.org
Pat Jenny	New York Community Trust	pjj@nyct-cfi.org
Molly Lunn	DOE	marion.lunn@ee.doe.gov
Sam Marks	Deutsche Bank	Sam.marks@db.com
Heather O'Neill	Robertson	heather_oneill@robertsonfoundation.org
Chinwe Onyeagoro	O-H Community Partners	chinwe.onyeagoro@o-hcommunitypartners.com
John Padilla	Annie E. Casey	jpadilla@aecf.org
Pete Plastrik	Innovation Network for Communities	pete@in4c.net
Mariella Puerta	Barr Foundation	Mariella.Puerto@barrfoundation.org
Arlene Rodriguez	Living Cities	arodriguez@livingcities.org
Joel Rogers	Center on Wisconsin Strategy (COWS)	jrogers@cows.org
Tracey Ross	Living Cities	tross@livingcities.org
Bruce Schlein	Citi	bruce.s.schlein@citi.com
John Wilson	Energy Foundation	john@ef.org