

# **If We Ramp Up, Will They Come? Assessing Employer and Workforce Readiness to Accelerate Energy Efficiency in Three Midwestern States**

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## **ABSTRACT**

The American Recovery and Reinvestment Act invested millions in support of “green job” development and training – much of it targeted at the transition to clean energy. Across the country, energy efficiency programs are at various stages of an unprecedented ramp-up. How aligned are these two efforts? Will employers and appropriately skilled human capital be available for energy efficiency programs – or do we face skill and other workforce barriers to accelerating energy efficiency? Are there gaps we can address now to support energy efficiency and robust economic development?

The Energy Center of Wisconsin is examining these questions in a series of research projects designed to move past the policy messaging around green jobs and create more focused, objective insight and recommendations. This research will examine exactly what skills we need to support specific energy efficiency programs, where investment may not be necessary, and workforce market barriers that neither ARRA nor current energy efficiency programs are currently addressing.

These research projects focus on three Midwestern states seeking a post-manufacturing workforce transition. Wisconsin, Michigan and Illinois are in various stages of energy efficiency program delivery, ranging from new and modest programs to mature and accelerating programs. This paper will share the results of the first research project, which includes perspectives from thought leaders from a broad spectrum of workforce, economic development, and energy efficiency perspectives. The paper will also map ARRA investments and energy efficiency programs to assess opportunities to better leverage ARRA investments to support job creation in energy efficiency.

## **Background: Home Retrofit Focus**

The Energy Center of Wisconsin is a private, non-profit organization that accelerates energy efficiency through research that supports informed decision-making<sup>1</sup>. The Energy Center also produces training events and online programs to support technical skill development that advances energy efficiency<sup>2</sup>. Many Midwestern states have recently mandated high targets (1.5% - 2.0% of demand reduction), even in states that have not set targets or mandated ratepayer-funded efficiency programs in the past. ARRA grants support emerging models such as community-based programs and innovative financing models. The combination of new investment and new models will – hopefully – lead to a significant increase in energy efficiency in the Midwest. The Energy Center is conducting on-going research and monitoring of these developments to inform its mission and provide real-time recommendations to drive program decisions. This research is intended as a compliment to more comprehensive research efforts.

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<sup>1</sup> [www.ecw.org](http://www.ecw.org)

<sup>2</sup> [www.ecw.org/university](http://www.ecw.org/university)

The Energy Center is particularly interested in the home retrofit sector because of the energy savings potential, the complexity of the barriers at play, and the traditional difficulty of achieving scale – e.g. significantly higher than historic participation rates and greater energy savings per project - in this sector. Early ARRA investments through the U.S. Department of Energy (DOE) and Department of Labor (DOL) have already aimed significant funding and specific program requirements at “green jobs,” but how much of this workforce development will support scale in the non low-income residential sector? At the time of this writing, emerging programs such as the Retrofit Ramp-Up and Home Star indicate even more resources directed towards driving demand for services in this market. This project focuses on the non low-income retrofit sector because of the lack of infrastructure to support scale in this market (in contrast to the comparatively well-developed infrastructure of the Weatherization Assistance Program for the low-income sector).

Table 1 illustrates the number of homes where significant energy savings could be captured compared to the scale of recent program targets or achievement in the three states.<sup>3</sup> We used U.S. Census data and results from a 2000 market characterization study conducted by the Energy Center<sup>4</sup> to estimate the number of non-low income homes in Wisconsin, Illinois and Michigan that have a significant energy efficiency retrofit opportunity (defined as a major ceiling or wall insulation or air sealing opportunity). We then reviewed utility regulatory filings and other relevant documents that discuss participation goals for energy efficiency programs targeting comprehensive retrofits in the non-low income market. In each state, ratepayer funded programs are seeking to reach much less than 1 percent of the potential market each year. Results of this comparison are shown in the table below.

**Table 1. Program Targets vs. Potential Retrofit Opportunity**

		Retrofit Program Targets (homes retrofitted per year)		
		2008	2009	2010
<b>Non Low Income SF Homes Built before 1970 with major retrofit opportunity</b>				
Illinois	905,878	273 (0.03%)	2,670 (0.29%)	4,400 (0.49%)
Michigan	955,506		300 (0.03%)	400 (0.04%)
Wisconsin	493,212	1,350 (0.27%)	1,050 (0.21%)	1,800 (0.36%)

## Market Barriers

A recent analysis by McKinsey & Company presents a compelling synthesis of barriers that inhibit energy efficiency improvement in the non-low income retrofit market<sup>5</sup>. We used the McKinsey barrier framework to assess the extent to which ratepayer-funded residential retrofit programs and ARRA DOL awards in Wisconsin, Illinois and Michigan address these market barriers.<sup>6</sup>

<sup>3</sup> See specific program plans cited in sources at the end of the paper.

<sup>4</sup> Pigg, S., and Nevius, M., 2000. *Energy and Housing in Wisconsin: A Study of Single-Family Owner-Occupied Homes*. Report No. 199-1, Energy Center of Wisconsin.

<sup>5</sup>Granade, H.C., Creyts, Derkach, J.A., Farese, P., Nyquist, S., & Ostroski, K. 2009. *Unlocking Energy Efficiency in the U.S. Economy*. McKinsey & Company.

<sup>6</sup> As agency barriers (e.g., split incentives between owners and tenants) primarily affect the rental housing market, we omitted this barrier from our analysis.

Our assessment of ratepayer-funded program offerings<sup>7</sup> in the three Midwest states focused on the following types of energy efficiency programs: comprehensive “whole building” retrofit programs such as Home Performance with ENERGY STAR and similar models, programs targeting efficient heating and cooling opportunities, market transformation initiatives such as service provider training programs, and programs offering financing for energy efficiency retrofits.

The DOL “green jobs” awards consisted of \$500 million available through competitive bidding nationally in five program categories. For this analysis, we focused on the three types of awards most likely to directly address market barriers in the home retrofit market: first, the *Energy Training Partnership* grants available to non-profit entities teaming with market stakeholders to develop “green career pathways” at the local level<sup>8</sup>; second, the *State Energy Sector Partnership* grants available to state agencies to “create an integrated system” for “low-income, low-skilled workers leading to employment in green industries” in support of Governors’ energy and workforce priorities<sup>9</sup>, and third, the *Pathways out of Poverty* grants supporting training and other support services aimed at individuals at or below the poverty level.<sup>10</sup>

We examined program offerings in the target states in the context of the barriers as defined in the McKinsey analysis. The results show strong coverage addressing some market barriers and significant gaps in addressing other barriers, as shown in Table 2.

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<sup>7</sup> Ratepayer-funded energy efficiency initiatives have well-established models for supporting comprehensive retrofits in non-low income homes. Typical forms of program support include assistance in identifying opportunities (from energy audits to comprehensive building diagnostics), consumer marketing and education, service provider outreach and training, and incentives and/or financing for retrofit improvements. Comprehensive retrofit programs have been available in Wisconsin for many years, primarily through the statewide Focus on Energy program. Ratepayer-funded energy efficiency programs in Illinois and Michigan have ramped up more recently, beginning in 2008 for Illinois IOUs and 2009 for Michigan IOUs. Despite the relative newness of Illinois and Michigan programs, comprehensive retrofit programs are part of all of the IOU portfolios.

<sup>8</sup> [http://www.doleta.gov/pdf/ETP\\_SGA\\_Award\\_Summaries\\_FINAL\\_02032010.pdf](http://www.doleta.gov/pdf/ETP_SGA_Award_Summaries_FINAL_02032010.pdf)

<sup>9</sup> [http://www.doleta.gov/pdf/SESP\\_Summaries\\_FINAL\\_02042010.pdf](http://www.doleta.gov/pdf/SESP_Summaries_FINAL_02042010.pdf)

<sup>10</sup> [http://www.doleta.gov/pdf/Summaries\\_for\\_Pathways\\_Out\\_Poverty\\_updated\\_20100203\\_NoPhone.pdf](http://www.doleta.gov/pdf/Summaries_for_Pathways_Out_Poverty_updated_20100203_NoPhone.pdf)

**Table 2: Addressing Market Barriers**

	<b>Ratepayer Programs</b>	<b>DOL Programs</b>
<b>Barriers</b>		
Structural Barrier: Transaction	Moderately addressed through contractor networks and training. Limited coverage through direct install offerings in some programs.	Strong emphasis on workforce training, but weak or nonexistent links to energy efficiency programs and employers, so training relevance is an issue.
Behavioral Barrier: Awareness	Moderately addressed by mass consumer education and trade ally marketing opportunities, but limited to measures that fit cost-effectiveness tests. Some programs also include home energy audits, direct install, and/or ally incentives.	Not addressed
Behavioral Barrier: Risk & Uncertainty	Moderately addressed through limited ally training.	Moderately addressed through emphasis on training to energy efficiency industry credentials for incumbent workers. Significant emphasis on career paths through organized labor, which has very limited penetration in residential market. Weakly addressed in training for hard-to-employ populations where new credentials are not recognized by energy efficiency industry.
Availability Barrier: Capital Constraints	Moderately addressed through limited financial incentives for consumers. A small number of programs offer financing.	Not addressed.
Availability Barrier: Installation/Use	Moderately addressed through limited contractor certification and oversight.	Not addressed

- **Structural barrier: transaction.** Most of the ratepayer programs we reviewed offer strategies to reduce transaction barriers, such as coordinating networks of qualified service providers, training, and some direct install (primarily for low-cost measures such as CFLs and low flow devices). Many of the DOL grants will support apprenticeship programs which will permanently integrate energy efficiency into skilled trade career paths or community college degrees. Most of the DOL grant training models take a long-term (2+ years) approach to training workers.
- **Behavioral barrier: awareness.** Almost all of the ratepayer programs we reviewed have a consumer education component, with program plans describing a variety of strategies to increase homeowner awareness of efficiency opportunities. DOL grants do not include consumer education.
- **Behavioral barrier: risk & uncertainty.** Ratepayer programs use a variety of strategies to address risk and uncertainty from the consumer perspective. There was inconsistency in terms of the extent to which ratepayer programs require service providers to meet industry standards or certification requirements such as those

established by BPI, RESNET, or ACCA.<sup>11</sup> DOL training and placement strategies ranged from certifications recognized by the energy efficiency industry (e.g. BPI, RESNET, LEED), to those with ties to programs moving through the legislative process (e.g. Laborer’s Union certifications that will likely be accepted as a substitute to BPI under the Home Star program), to localized “green building” certifications, to no certification or credentialing strategy.

- **Availability barrier: capital constraints.** Many of the ratepayer programs we looked at offer financing or incentives that reduce consumer capital constraints by lowering the homeowner’s up-front costs. However, available incentives are relatively small compared with the cost of implementing a comprehensive retrofit.<sup>12</sup> Emerging financing approaches through ARRA DOE awards to community-based programs, and much larger incentives through the proposed Home Star program could provide significant new resources to address capital constraints.
- **Availability barrier: installation/use.** Most ratepayer programs include initiatives to insure quality installation and appropriate use of technologies, such as consumer education, home energy audits, service provider training and sometimes certification requirements for service providers. DOL awards address a number of training strategies, but few of the proposed training ideas demonstrated a deep understanding of the specific competencies required by ratepayer funded programs.
- **Barriers that were not addressed.** The documentation we reviewed did not explicitly discuss whether any of the programs provide support to address risk from the service provider perspective, such as financing or incentives that support purchases of new equipment. None of the programs include training to support the growth of service provider businesses – including education about new business models at a larger scale, or business management skills to support entrepreneurial growth. Neither the ratepayer programs nor the DOL awards address structural barriers around ownership transfer (e.g. time-of-sale mandates to improve energy efficiency, on-bill financing mechanisms) or pricing distortions (e.g. green MLS). And none of the programs address consumer behavioral barriers beyond financing or general awareness, such as deeper homeowner education about energy savings opportunities through assessment tools, addressing the “hassle factor” involved with home retrofits, or some of the new social marketing approaches being piloted across the country.

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<sup>11</sup> It is possible that some of the programs we looked at do have these requirements, but did not specify them in their program plans or marketing literature.

<sup>12</sup> We estimate the per-home cost of a comprehensive energy efficiency retrofit is \$5,500. At current incentive levels from Focus on Energy’s Home Performance with ENERGY STAR program, the maximum program incentive for air sealing, installing attic and sidewall insulation and a high efficiency furnace would be \$925 (which includes a \$300 completion bonus for implementing at least three measures). Program incentives thus cover less than 20 percent of the homeowner’s up-front cost in Wisconsin, the state with the longest history of energy efficiency programs of the three states examined.

## Other Key Findings

Another key finding was that relatively little of the DOL awards will support workforce development to scale home retrofits in the three states to an extent that will match demand for retrofit services (assuming that new state and federal programs are successful). The three award categories we examined total \$50 million in awards within the target states, with training and placement services targeting 14,069 workers. Of these, we estimate only 19% will be in the home retrofit sector. Illinois provides an illustrative example: the State estimates that 1,000 Energy Auditors and 3,476 Insulators/Building Envelope Specialists will be required to meet demand by 2015, but we could only find evidence of commitment to train and place 515 residential retrofit workers in the DOL grants pertaining to Illinois.

Most of the DOL partnerships described did not include traditional energy efficiency program administrators, energy efficiency non-profits, or green building specialists; teams were largely comprised of traditional workforce development agencies, unions, and some included community colleges. Many awards covered multiple states including those outside the focus states. Most of the awards include multiple clean energy training initiatives – including for the commercial construction sector and in renewable energy. Some of the training efforts will be restricted to labor union training programs; labor unions represent 16% of construction workers overall, with most of this coverage in the commercial sector.<sup>13</sup> Ratepayer funded program plans did not include specific workforce development targets – they tend to refer to training generically, if at all.

## Employer Perspectives

As part of this research, the Energy Center conducted a literature review of “green jobs” publications available at a national and regional level. A key finding emerged from this review. Many publications did not include employer perspectives, and those that did represented large manufacturers of building components or renewable energy systems, and more infrequently large commercial construction contractors. None of the documents we reviewed included perspectives from the residential retrofit contractor perspective.

In response to this gap, the Energy Center launched a number of initiatives to bring forward the residential retrofit employer perspective on scale and the workforce, including a survey of the Home Performance with ENERGY STAR contractors in Wisconsin<sup>14</sup>; a focus group of home retrofit contractors from Wisconsin and Illinois<sup>15</sup>; and a workforce roundtable<sup>16</sup> that included home retrofit contractors, representatives of the workforce development system, community and ratepayer funded program administrators, labor unions, and energy efficiency non-profits. Key findings from these activities articulated barriers to scale; we present them below organized in the McKinsey barrier framework.

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<sup>13</sup> White, S., Gordon, K. 2010. *Mapping Green Career Pathways: Job Training Infrastructure and Opportunities in Wisconsin*. Apollo Alliance.

<sup>14</sup> Cowan, C. 2009. *Workforce Development Study, Focus on Energy Trade Allies*, private report, Energy Center of Wisconsin.

<sup>15</sup> March, 2010 focus group of insulation contractors, HVAC contractors, home energy raters, and remodeling contractors working in home retrofit in WI and IL, Energy Center of Wisconsin

<sup>16</sup> March, 2010 workforce development roundtable, Energy Center of Wisconsin

**Structural barrier: transaction.** Employers cited inconsistency between program standards (e.g. bank, local code, ratepayer and community based program requirements) as a factor that added to their management burden and confused homeowners.

**Behavioral barrier: risk & uncertainty.** Employers' most significant barrier to adding employees and scaling up was the lack of demand for their services under current market conditions. While they are still called upon to prepare bids, 50% or fewer of these bids eventually convert to projects. They cited two main drivers around sluggish demand. First, many consumers are experiencing their own economic challenges – inability to obtain financing and uncertainty over future employment were repeatedly mentioned. Lower home valuation was mentioned as a factor. Second, changing program incentives and marketing hype about proposed tax incentives also drive consumers' reluctance to commit to projects. One contractor said “people are hesitant to act because prices are still dropping, incentives seem to be potentially expanding, and people are afraid that if they pull the trigger now they could do the project for 10% or 20% less plus tax rebates in six months. We need someone to call the bottom or the top so that people will seize the opportunity.”<sup>17</sup> All employers stated that they are smaller than their past peak size of operation; many laid off workers in 2010. As one employer put it “I started this business in the last recession, and I hope to God I make it out of this one.”<sup>18</sup>

**Awareness (behavioral barrier).** Employers repeatedly said that consumers do not distinguish between contractors who produce work that is installed correctly and will deliver on energy savings promises and low-bid contractors who do not install properly. Employers generally believe that poor economic conditions are making this situation worse. One mechanical contractor mentioned being underbid by contractors who quoted less than the cost of equipment; an insulation contractor said he is competing with “Pete in A Pickup” – sole proprietors driven into contracting in areas with high unemployment who are not properly trained and who underbid his company.<sup>19</sup> All of the employers indicated strong support for certification requirements under ratepayer, community and federal programs so that homeowners must make a distinction between qualified and unqualified contractors in order to receive incentives.

**Availability barriers.** Employers cited a number of barriers related to workforce availability and quality control of installation. Insulation contractors expressed concern that if demand increases, not enough people will be willing to perform insulation and air sealing. It is perceived as a low-status, low-skilled job and as a dirty job: “existing homes work is hard, grungy and crappy.”<sup>20</sup> One contractor requires new hires to view a video of crawl spaces and attics to confirm whether new hires still want the job after viewing their working conditions.

In contrast to the perception of the status of insulation work, employers stated that they must screen new hires carefully for a number of soft skill and background issues because they will be working in occupied homes and exposed to personal property and to children. Issues included insurance requirements for a clean driving record, criminal background checks, communication skills and a temperament able deal with homeowner anxiety.

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<sup>17</sup> Focus group – an insulation contractor

<sup>18</sup> March, 2010 focus group – HVAC contractor

<sup>19</sup> March, 2010 focus group – insulation contractor

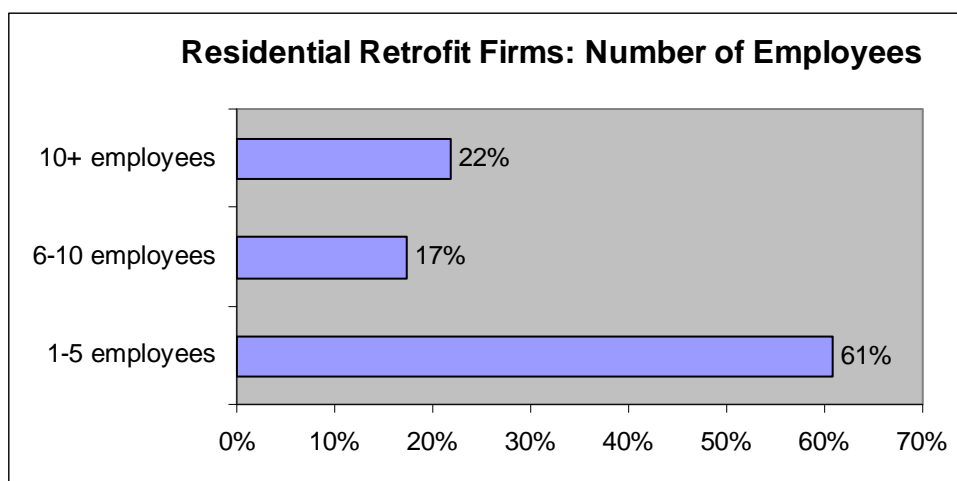
<sup>20</sup> March, 2010 workforce roundtable – insulation contractor

Another key issue cited was experience and the length of time it takes to master existing building work. Because of the variable nature of existing homes – with a wide range of past remodeling projects and different in-field situations, experience “doing it right” was highly prized in new hires. One contractor said “I look for people trained in best practices, not trained to just meet code or I just have to retrain them.”<sup>21</sup> A program administrator stated that Home Performance with ENERGY STAR consultants with two years of field experience still occasionally had to consult with a mentor on unique in-field situations.<sup>22</sup> As one insulation contractor put it: “I put the guys on new construction so I don’t burn them out – it’s open, it’s easy, and you don’t have the nitsy-natsy move the end tables and don’t let the cat out situations.”<sup>23</sup>

Several availability barrier issues were cited in relation to the education and training of the workforce. Program managers cited a shortage of qualified trainers with the appropriate in-field experience to develop worker competency. Employers were enthusiastic about supporting apprenticeships and respected labor union skilled trade career paths. Most employers support one- and two-day continuing education courses for their employees because of the amount of learning they felt was required to perform “quality” work.

A number of challenges related to the average size of these contracting businesses also pose availability barriers to scale. Wisconsin has the longest experience with programs targeting home retrofits, yet the actual size of contracting firms is very small. Figure 1 shows the results of an employer survey in Wisconsin documenting business size.<sup>24</sup>

**Figure 1: Size of Firms**



When asked to describe the “ideal” size company they would like if market conditions supported growth, the average size cited by employers in this market was 12 employees. Scaling up means adding management burdens that are especially difficult for very small businesses –

<sup>21</sup> March 2010, workforce roundtable – builder  
<sup>22</sup> March, 2010, workforce roundtable – insulation contractor  
<sup>23</sup> March, 2010 focus group – insulation contractor  
<sup>24</sup> Coan, *ibid.*



challenges cited included insurance, equipment and vehicle purchases, facility space, and universally, being able to assure quality installation. An insulation contractor said “I am limited by the quality of employees and the quality of supervision.”<sup>25</sup>

## Conclusions & Recommendations

- **Availability barriers involving access to capital continue to suppress demand for home retrofits, but this could change soon.** Employers will not grow and create jobs until consumer demand for home retrofits increases, and the limited ratepayer funded incentives we found are unlikely to increase demand significantly. However, the implementation of substantial incentives under the proposed federal Home Star program combined with community-based financing programs may alter this situation. Program managers must be prepared to support a rapid employer ramp-up if demand increases – especially in states like Illinois and Michigan where programs have not had enough time to develop strong trade ally networks.
- **Traditional energy efficiency programs, emerging community-based efficiency programs and workforce development systems share common interests but are not working together to address behavioral barriers around risk and uncertainty, or availability barriers around product (e.g. contractor) availability.** Without collaboration, many of the DOL grants will fund training that may or may not develop the competencies and certifications that will be required to meet energy efficiency program requirements. Also, if tapped by energy efficiency programs, the workforce development system could provide a more efficient pipeline of new workers and help small retrofit employers reduce their recruitment risks. Because the DOL grants are early in their cycles, efforts to communicate and coordinate now could lead to more effective results in both job placement and energy savings performance. Programs should also coordinate to agree upon program, certification and accreditation standards.
- **To address short-term availability barriers in trained contractors, short-term training solutions need to be developed.** DOL-funded career path, certification and apprenticeship development can create enduring systems and permanent market transformation. However, since most of these solutions are not yet developed and will take two or more years to deliver, short-term training will be needed to bridge the gap if demand for retrofits increases rapidly.

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<sup>25</sup> March, 2010 focus group – insulation contractor

- **Current programs and grants do not address most risk and uncertainty barriers that employers face.** The home retrofit market is comprised mainly of small businesses led by owners with years of field experience and technical expertise. Many program and policy leaders believe that increased demand will automatically drive market development to match the demand. The nature of this market does not lend itself to scale – competently - as easily as markets dominated by larger companies or manufacturing models. Program managers and future ARRA initiatives should consider more support for employers, including business training, incentives to address capital barriers, and business models like co-ops and other approaches that could reduce management burdens for very small businesses.
- **Employers strongly support certification and training requirements.** As long as certifications and training are tied to competencies required for quality installation, energy efficient contractors view certifications as a way for homeowners to distinguish between quality contractors and fly-by-night operations.
- **More geographically-focused research is needed.** Programs and future federal investments could benefit from more research and specificity about the potential for energy savings and jobs in the home retrofit market, particularly if the research is highly focused geographically to match the local nature of home retrofit work.

Perhaps no other market sector presents such a combination of potential for energy savings and job creation at the same time presenting complicated, behavior-driven market barriers. If program planners can address these barriers with innovative solutions, programs can deliver on the potential in the Midwest.

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