

Seattle Community Power Works

Fall 2012 Progress Report



Prepared by
Washington State University Energy Program

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Executive Summary

In June 2012, Community Power Works started the final year of a three-year U.S. Department of Energy (DOE) Better Buildings Neighborhood Program grant. The City of Seattle put forward an aggressive proposal to test innovative strategies to encourage efficiency upgrades for single-family and multi-family residences, small businesses, hospitals, and large commercial and municipal buildings. Much of the first year was focused on refining delivery models and establishing the necessary infrastructure to deliver services in each of these sectors. The program is in the second year of its two-year deployment phase.

The program set the bar for success very high by establishing aggressive goals for energy efficiency investment in six sectors simultaneously¹ – and is the only Better Buildings grantee (of over 40) to work in more than two sectors. This required launching multiple new programs and delivery partnerships. Early on, Community Power Works encountered significant barriers to participation and investment in all sectors. As more than one stakeholder observed, the program “bit off much more than it had the capacity to chew.”

In each of the sectors, multiple strategies and delivery models have been deployed, assessed, refined and changed. **Although Community Power Works has not met all of the aspirational goals in the original proposal, it has demonstrated success in many areas and has a valuable story to tell about rapid learning and adaptive management.**

As a result, the program is beginning to spark significant investments in energy upgrades. As of September 30, 2012, Community Power Works has completed 1,077 energy upgrades. An additional 352 projects have signed bids. The total investment in completed and signed projects is \$29 million.

Community Power Works for Home

Community Power Works is successfully meeting its goal to test innovative strategies for delivering energy efficiency services and for increasing the capacity of Seattle’s building performance industry. Community Power Works for Home has demonstrated that:

¹ Community Power Works provided program services and investment for single-family homeowners (Community Power Works for Home), small restaurant and retail (Community Power Works for Small Business), hospitals and large commercial buildings. The program provided supplemental funding to the Seattle Office of Housing to expand the reach of existing low-income weatherization programs for single- and multi-family residences. Community Power Works provided policy support, but no incentives or direct services, for municipal projects.

- **Intensive support services lead to comprehensive upgrades, good customer service and high conversion rates.** While these services get strong results, they are costly as currently configured. For long-term sustainability, it is critical to decide which support services to keep and how to reduce costs for providing and administering these services.
- **Loans are an important part of the energy upgrade service model.** One in four completed or in-progress projects involved loan financing. Loans are particularly useful for supporting high-cost projects (>\$10,000). A good loan product must be attractive to both the homeowner (providing lower rates and choice) and to the contractor (providing speed of approval and payment).
- **It is important to keep design simple and straightforward.** A central feature of the original program design, the Carbon Reduction Incentive, was difficult for contractors to explain and for homeowners to understand. Homeowners and contractors preferred a much simpler incentive program. One of the biggest barriers to whole-house upgrades is the complexity of the process. Successful program design and delivery should make things less complicated, not more complicated. Fewer choices are often better than more choices.

Community Power Works was most successful at filling underserved gaps and markets. For example:

- Very few resources for energy efficiency upgrades have been available for customers with oil-heated homes in the last 25 years. Although one in seven single-family homes in Seattle has oil heat, well over half of completed or signed upgrades are oil heat customers.
- The City of Seattle's Office of Sustainability and Environment (OSE) formed a partnership with the Seattle Office of Housing (SOH) to provide \$1.45 million supplemental funding to existing low-income weatherization programs. The funding enabled the SOH to fill gaps and maintain service and production levels, particularly in multi-family housing.

Although it is too soon to draw definitive conclusions, **we are finding strong evidence that the program is increasing the capacity of, and skills within, the home performance industry in Seattle.** For example:

- Contractors report new, more integrated service delivery (assessment through construction) and more experience with larger, more comprehensive projects. Many have developed new partnerships and business relationships with subcontractors to provide more complete services.
- An independent evaluation of the quality and completeness of energy assessments found a significant improvement between audits provided in 2011 and those completed during the summer of 2012.

Community High-Road Agreement (HRA) standards are working well as a flexible, more efficient alternative to other systems for assuring quality installations and living-wage jobs. Reporting has been comprehensive, efficient and accurate. The model and associated reporting and

enforcement mechanism have solid buy-in from contractors. Consequently, verified compliance rates are close to 100%.

Hospital and Commercial Projects

Take-up of the Hospital Carbon Reduction Incentives was lower than expected.

Comprehensive upgrades require large amounts of capital. The internal competition for capital is intense, especially for hospitals, which are averse to taking on financing risk. Capital project approval processes are highly structured and incentive programs must fit those timelines. Community Power Works' incentives were comparably modest and were not considered big enough to drive capital investment decisions.

More importantly, because hospitals operate 24 hours a day, upgrade projects must be carefully phased and scheduled with mission-critical capital improvements to minimize disruptions to critical health services. **Nonetheless, all four participating hospitals found that the financial assistance for developing a Strategic Energy Management Plan was a valuable aid in identifying potential projects and aligning them with capital improvement and facility master plans.**

The small business sector has presented multiple challenges. Sign-ups and conversion rates for the small retail and restaurant sectors have been well below expectations – even when combined Community Power Works and utility incentives cover almost two-thirds of project costs. Very few business owners also own the building, cash flow is very tight, utilities have offered incentives in this sector for some time, and there are significant opportunity costs in the form of disrupting service for installing measures. Consequently, Community Power Works for Small Business is focusing on fewer, higher-quality upgrades.

Initial take-up of incentives and financing in the large commercial sector was also lower than expected. Community Power Works has facilitated completion of one energy efficiency project (300,000 square feet) and a second project (110,000 square feet) is under construction.

Program partners suggest that lack of response to the initial large commercial offer was tied to:

- Uncertainty in the overall economic environment and the commercial real estate market. This increased the risks associated with making long-term capital investments.
- Lack of familiarity with a new financing model among large commercial property owners and lack of knowledge among program partners about how to most effectively position these projects to see them through to completion.
- The scale and complexity of decision-making processes and the difficult challenge of effectively managing these processes. Each project involves unique and complex organizations, building systems, and lengthy multi-party negotiations of detailed multi-year agreements. Developing, closing and completing these projects has required long lead times,

long-term relationships and experience working with executive, legal and finance officers in large organizations.

In the spring and summer of 2012, the program and its partners made significant investments in:

- Bringing expertise to develop a deeper understanding of business requirements, internal return on investment (ROI) hurdles that building owners evaluate before undergoing energy efficiency work and internal project approval processes.
- Establishing awareness of a new financing model and understanding how to introduce it to building owners using their language and speaking to their needs.
- Expanding eligibility for Carbon Reduction Incentives from approximately 200 large buildings in the Seattle Steam district to over 1,500 buildings in the Seattle 2030 District.
- Providing a “special offering” for Seattle Steam customers. This offer involved higher incentives, which in turn drove down the cost of capital to better match the ROI thresholds that building owners require for moving projects forward.
- Streamlining and coordinating service delivery among the delivery partners, including utilities. As part of this effort, on-going management of carbon reduction incentives was shifted to the Seattle 2030 District.

The program’s delivery partners are reporting increasing movement and momentum in the large commercial pipeline since the summer.

- Six new projects in the Seattle 2030 District have started the application process.
- Ten Seattle Steam projects have taken the next steps in the conversion process.
- As of September 30, 2012, six projects totaling 1.6 million square feet were in final negotiations for Energy Service Agreements.
- Property owners have signed agreements committing to completing investment grade audits in six buildings totaling over 2.2 million square feet.

While this recent movement in the large commercial pipeline is very encouraging, it is too early to draw conclusions about the success or viability of Community Power Works’ large commercial financing services models.² What is clear is that:

- Although energy savings, incentives and financing services do matter, these benefits have limited power to drive upgrade decisions in complex facilities on their own.

² A case study of the large commercial program is underway and will be available in spring 2013.

- Moving large commercial projects forward requires close coordination, long-term technical support, and targeted marketing and incentives to help building managers better position efficiency projects for internal approval or to incorporate efficiency options in ongoing capital improvement cycles.
- A significant, early and continuous investment is needed to build and then maintain “organizational readiness” to make major investments in energy efficiency in the large commercial sector.

Introduction

In 2009, the City of Seattle's Office of Sustainability and Environment (OSE) applied for a \$25 million competitive U.S. Department of Energy (DOE) Energy Efficiency and Conservation Block Grant authorized by the 2009 American Recovery and Reinvestment Act. DOE's goals for the grant were to develop new models for encouraging and delivering comprehensive energy-efficiency upgrades and spur job creation.³ The city put forward an aggressive proposal to test innovative strategies that were intended to encourage efficiency upgrades for single-family and multi-family residences, small businesses, hospitals, and large commercial and municipal buildings. The proposal⁴ focused delivery in downtown and southeast Seattle (Attachment 1).

In April 2010, DOE awarded a three-year, \$20 million grant to the city. The city accepted the grant in July 2010. Community Power Works is one of more than 40 community-based pilot projects testing new models for building the energy efficiency economy administered through the DOE's Better Buildings Neighborhood Program.

OSE focused its role on strategic and policy direction, contracting and reporting functions. To date, OSE has contracted or negotiated agreements with more than 20 private, non-profit and utility partners for marketing, implementation and service delivery. Many of these partners sub-contracted some tasks that require special expertise. Well over 100 partners and businesses are part of the Community Power Works delivery team (Attachment 2).

As the city and its partners built new services, partnerships and delivery models from the ground up, much of the first year of the program was spent refining program design and delivery strategies, establishing contracting relationships, and building the required service delivery infrastructure. As shown in Table 1, Community Power Works phased-in launch of the small business and multi-family programs later in 2011; this ensured that sufficient resources, attention and capacity were available to launch Community Power Works for Home and efforts for hospitals and large commercial buildings.

As of September 30, 2012, with eight months remaining in the grant, Community Power Works has expended \$9.4 million (47%) of the original grant. In response to lower than expected demand,

³ The initial grant was known as the Residential Ramp Up Grant. The name was later changed to the Better Buildings Neighborhood Program. DOE defined comprehensive as achieving a minimum savings of 15 percent. This standard was later relaxed to an average reduction in energy use of 15 percent.

⁴ The program name in the proposal was the Weatherize Every Building (WEB) initiative. In 2010, the WEB initiative was rebranded as Community Power Works.

greater than anticipated challenges, and feedback from partners and contractors, Community Power Works has continuously adapted program design and incentive strategies, and reallocated funds across all six sectors. Key changes include:

- Increasing incentives in the home, small business and hospital sectors.
- Expanding the service area for all sectors citywide.
- Simplifying and streamlining program processes and reporting.
- Providing additional and more targeted training and assistance for marketing, closing bids and workforce development.

Table 1. Community Power Works Timeline

Community Power Works Milestones	Month
Contact Awarded	April 2010
Contract Accepted	July 2010
Hospitals First Carbon Reduction Incentive	November 2010 – April 2011
Large Commercial Phase 1	January 2011 – June 2012
Home Launch	February – April 2011
Hospitals Second Carbon Reduction Incentive	June 2011 – December 2011
Small Business Initial Launch	October 2011
Low-Income Partnership with Seattle Office of Housing	Summer 2011
Multi-family Partnership with Seattle Office of Housing	Fall 2011
Home City-wide Launch and Design	January 2012
Hospital Final Incentive Offer	January – April 2012
Small Business City-wide Launch and Redesign	May 2012
Sustainability Planning Starts	June 2012
Large Commercial City-wide Launch	July 2012

As a result of these changes, homeowner and business take-up of Community Power Works services and incentives is increasing. The program is making progress toward current upgrade, investment and leverage goals (Table 2). Further detail is available in Attachment 3.

In addition to meeting upgrade and investment goals, Community Power Works also intended to:

- Test new marketing, service delivery and financing mechanisms.
- Increase homeowner demand for – and contractor capacity to deliver – high-quality comprehensive energy-efficiency upgrades.
- Develop and test the Community High-Road Agreement – an alternative, collaborative and flexible partnership involving the city, contractors, workforce training organizations, labor and community groups to assure quality services, build a skilled workforce, provide family-wage jobs and benefits, and offer career pathways for new hires and returning workers.

Table 2. Community Power Works Overall Progress Report – September 30, 2012

	DOE Goal	Complete	Signed Bids	% Target Reached ¹	Total Investment (\$000) ²	Estimated Carbon Saved (mT/year) ²	Estimated Energy Saved (mBTU/year) ²
Residential	2,070	1,054	333	67%	9,740	1,236	14,961
Home Program (homes)	n/a	359	212	n/a	5,541	614	9,681
HomeWise (homes)	n/a	153	55		1,558	235	2,296
Multi-family (units)	n/a	542	66	n/a	2,641	387	2,984
Commercial (Square Feet)	675,000	312,000	124,000	66%	1,071	985	191
(Buildings)	n/a	7	8	n/a			
Large Commercial (Bldgs)	n/a	1	1	n/a	891	956	Pending
Small Business (Business)	n/a	6	7	n/a	180	29	191
Hospital (Hospitals)	4	3	1	100%	6,583	896	7,036
Municipal (Buildings)	14	13	10	178%	831	459	Pending
(Square Feet)	70,000	485,000	245,000	1,043%			

¹ Projects completed or signed

² Projects completed

Community Power Works is already adding to the local and regional knowledge base on the costs, benefits and outcomes associated with community-based energy efficiency program delivery. This Mid-Project Report also tells a story of adaptive management in each of the sectors, summarizing barriers encountered, lessons learned and changes made in program design and service delivery in the first two years of Community Power Works. Additional results and findings will be available over the coming year.

The ultimate measure of Community Power Works' success is whether all or parts of the models and tools developed under the program are sustained after the grant period ends. OSE launched a comprehensive sustainability planning effort in the summer of 2012, which includes an extensive stakeholder process and a smaller team of stakeholders working to develop a business case. The process is moving forward; however, it is too soon to draw conclusions about whether a clear path toward long-term sustainability will emerge. This document was developed to provide additional background for the sustainability planning effort.

Community Power Works for Home

Initial Service Delivery Model

The initial Community Power Works for Home service delivery model included:

- Use of community-based and social media marketing.
- A subsidized Energy Performance Score (EPS) assessment. Seattle City Light covered \$305 and the homeowner paid \$95 for this assessment.
- An incentive based on the amount of carbon reduced (the Carbon Reduction Incentive Fund, or CRIF) to supplement existing utility incentive programs.⁵ The incentive was paid directly to the contractor on the homeowner's behalf. This approach provided flexibility around prevailing wage requirements and provided leverage over contractors to assure compliance with program standards and reporting requirements.
- Standard and low-income loan financing with on-bill financing through Seattle City Light. Initial loan products were developed and managed by Craft3.
- The EnergySavvy IT Platform – a web-based application that automated projects from homeowner application, assessment, bidding, test-out and payment of incentives – was the information and project delivery backbone of the program.
- On-line and phone support and troubleshooting for customers and contractors by the Home Retrofit Coordinator (HRC). The HRC service, provided by Cascadia Consulting, included developing the delivery model and incentive structure, actively monitoring customer projects, answering questions, assuring quality of upgrades by reviewing bids and invoices, and developing and managing the contractor network.
- Referrals to a pre-approved list of contractors screened for their willingness to abide by HRA Standards.
- 100% test-out for all projects using the EPS tool and a more streamlined visit protocol. The test-out visit (a \$200 value) was provided as a free service to all projects and was a condition of contractor payment.

⁵ The CRIF was \$10 per metric ton (MT) of CO₂e calculated over the life of the measures. Puget Sound Energy, the local natural gas utility, offered rebates for insulation, duct sealing and high-efficiency gas-heating systems. Seattle City Light offered energy audits through the EPS program, appliance rebates and a ductless heat pump pilot project for homes with electric baseboard heat. As part of Community Power Works, Seattle City Light offered rebates for insulation and duct sealing for Community Power Works' participants.

Changes to Program Design and Delivery in 2012

As documented in *Community Power Works for Home: Initial Progress Report* (January 2012), initial participation rates were lower than anticipated. Community Power Works for Home has since made several changes to program design and delivery. The most critical are described below.

Expanding the service area

Community Power Works' initial service territory was focused on central and southeast Seattle. As of January 1, 2012, all single-family households within Seattle city limits became eligible for services. This more than doubled the number of eligible households and simplified marketing and application processes.

Simplifying and increasing incentives

The original incentive structure was based on the amount of carbon saved. The CRIF was difficult to administer and hard for contractors to explain, and methods of calculating and valuing carbon savings yielded modest incentives. In January 2012, the program moved to an incentive structure based on the estimated percentage reduction in energy use⁶ matched with additional rebates to encourage installing high-efficiency heating systems. The average of total Community Power Works incentive payments (including the Energy Savings Incentives and high-efficiency heating system rebates for completed projects) increased from \$1,237 in 2011 to \$2,198 in June through August 2012. Average incentives for projects under construction in September 2012 are \$2,567.

Offering better financing options

Starting in January 2012, Craft3 reduced loan interest rates from 4.49% to 3.49% for low-income loans, and from 5.99% to 4.49% for standard loans. In April 2012, Puget Sound Cooperative Credit Union was added as an approved lender and began offering loans from 4.25% to 4.75%, depending on credit history.

Streamlining program delivery

OSE worked with the Cascadia Consulting Group and EnergySavvy to continuously improve customer management and program reporting, and with Earth Advantage Institute to improve the EPS audit tool. Other changes include referring applicants to a single contractor (unless multiple referrals were requested) and moving the contract for fulfilling rebates to a contractor with more experience in payment processing.

⁶ Energy Savings Incentives: 10-14% savings (\$250), 15-20% savings (\$1,250), 21-30% savings (\$2,000), more than 30% savings (\$2,500). The high-efficiency heating rebate was \$1,200.

Targeting homeowners with oil-heated homes

One in seven (16% of 22,000) single-family homes in Seattle reported that their homes were heated with fuel oil.⁷ These homeowners face high heating costs and have had no financial assistance to help make efficiency upgrades since the mid-1990s. Since upgrading these furnaces offers the best opportunity for reducing carbon, starting in January 2012, Community Power Works matched electric and gas utility rebates for insulation and weatherization, offered an additional \$1,200 rebate for switching to a high-efficiency electric or gas system, and provided a \$150 rebate to pay for oil tank decommissioning. These changes were followed with a direct-mail campaign in February 2012 targeted to oil-heated homes. Between April 2011 and March 2012, 21% of participating homes started with oil heat. By July and August 2012, the percentage had increased to 38 percent. Currently, over 60% of homes in the pipeline started with oil heat. Two-thirds (67%) of homes starting with oil switched to electric or gas space heat. Of those switching from oil heat, 29% switched to natural gas and 71% to electric space heat.

Community Power Works for Home Outcomes for 2012

These changes, most of which were introduced in January 2012, have contributed to an increase in the number of upgrade projects completed each month (Figure 1).

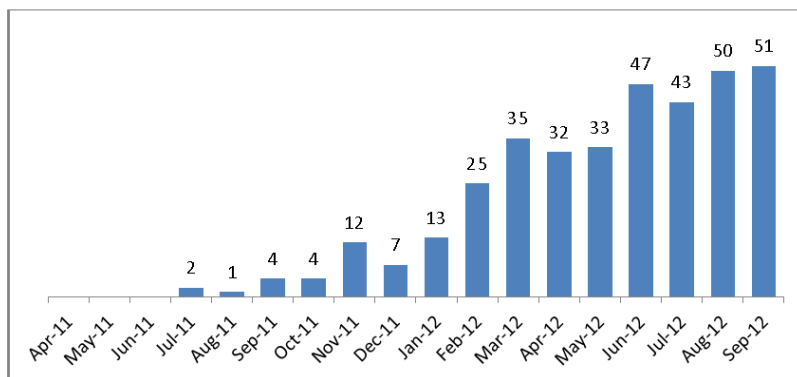


Figure 1. Number Community Power Works for Home Projects Passing Test Out

Participation rates are increasing

As of September 30, 2012, 359 homes had passed test-out and an additional 212 homeowners had signed bids. Monthly production has increased from 2 to 12 projects per month in 2011, to 30 to 35

⁷ WSU Energy Program analysis of 2006-2010 American Community Survey data. Seattle has the highest percentage of single-family homes heated with oil in Washington state. State-wide, 4.8% of single-family homes reported using oil heat.

projects per month in March through May 2012, and to 50 projects per month in August through September 2012. At current levels of production (50 completed projects a month), Community Power Works for Home will complete 750 projects by June 2013. Preliminary data indicate that monthly production is increasing to 75 units a month in October and November of 2012. At this rate of production, between 900 and 1,000 Community Power Works for Home projects will be completed by June 2013.

Loan signups are increasing

Loan take-up has increased from 16 % for projects completed through March 2012 to 24% for project completed June through September 2012. The number of signed loans increased from 13 to 151 between February 1 and September 30, 2012 (Figure 2).

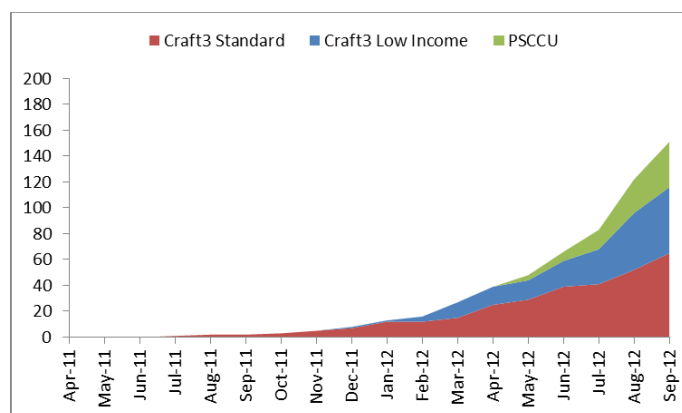


Figure 2. Community Power Works for Home – Cumulative Loans Signed by Month

Conversion rates are high and increasing

Conversion rates are best measured over time and are strongly influenced by program design.⁸ The application-to-bid conversion rate at six months for households applying after January 2012 is now at 31% (Figure 3). The one-year conversion rate from assessment to accepted bid is on track to exceed 50%.

Community Power Works' intensive support services are increasing and accelerating energy assessment conversion rates. Table 3 compares Community Power Works for Home conversion rates over time with the Oregon HERS program, which included assessments, somewhat lower

⁸ The gross conversion rate (all applicants to all projects past test-out) reported to DOE (12% through August 2012) considerably understates likely conversion because it treats all applicants the same, whether they have been in the program for one day or one year.

incentives and fewer support services.⁹ Community Power Works projects are hitting a 35% to 40% conversion rate in six months rather than the two to three years experienced by the HERS program. If these trends continue, Community Power Works for Home is on track to set one of the highest whole-house, energy-efficiency upgrade conversion rates in the Pacific Northwest.

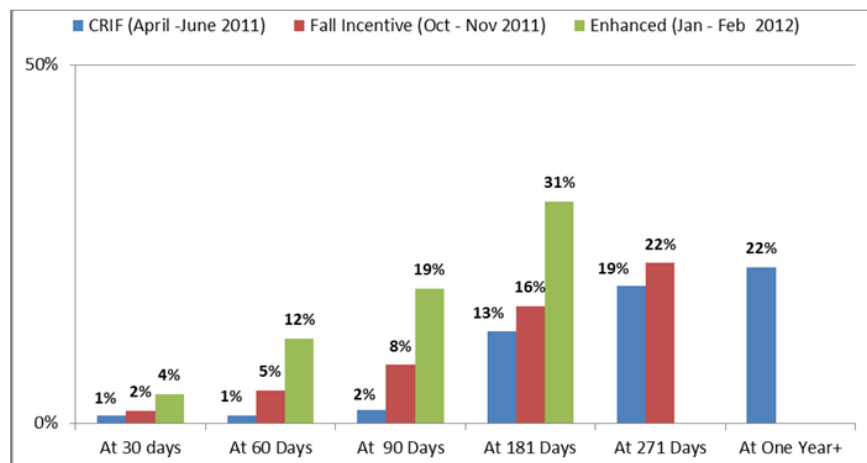


Figure 3. Community Power Works for Home Conversion Rates Over Time by Incentive Structure

Table 3. Community Power Works Audit Conversion Rates Compared to Similar Programs

Conversion rate	CPW Homes EPS Audit	Oregon HERS Audits
Three months	26%	11-17%
Six months	37%	6-22%
One year	NA	20-28%
Two years	NA	25-35%
Three years	NA	29-40%
Four or more years	NA	32-44%

This estimate of conversion rates does not include “free drivers,” applicants who applied for an assessment but did not apply for Community Power Works incentives or financing. A survey of

⁹ Dethman and Associates, *Corvallis Energy Challenge Evaluation Final Report*. Prepared for the Energy Trust of Oregon, Portland Oregon, April 2010: at:

<http://energytrust.org/library/reports/CorvallisFinalReportwithStaffResponse.pdf>

partial participants found that 30% completed energy-efficiency upgrades on their own, of which half were significant. Including these households would increase conversion rates by another 10%.

Community Power Works for Home upgrades are comprehensive

The average energy savings for projects past test-out through September 2012, as estimated by the EPS, is 29.2 percent, well above the DOE benchmark of 15% (Table 4).

Table 4. Community Power Works for Home Projects at a Glance – Projects Past Test-Out by September 30, 2012

	Average	Median	Range
Estimated energy savings (%)	29.2%	26.7%	3% – 78%
Total bid	\$10,492	\$8,047	\$845 – \$47,600
Community Power Works incentives	\$2,069	\$2,000	\$250 – \$4,440
Utility incentives	\$905	\$600	\$0 – 3,965
Estimated carbon reduction (MT/year)	2.13 MT	1.8 MT	-.7 – 9.7 MT
Estimated energy cost savings (\$/year)	\$746	\$432	-\$660 – \$4,105

Total upgrade package costs are increasing (Table 5). This is linked to the increasing number of oil-heated homes in the program and associated heating system replacements coupled with an increased incidence of other high-cost measures, including windows and tankless water heaters.

Table 5. Project Measures, Costs and Incentives are Changing

	Completed to January 2012	Completed June - Aug 2012	Fall 2012 Pipeline
Average Bid	\$10,667	\$10,828	\$14,627
% Oil heat	21%	32%	55%
% Replace Heating System	40%	38%	59%
Average Measure	4.0	3.4	3.5
Average Incentives	\$1,313	\$2,198	\$2,567

More measures and more comprehensive measure packages were installed in oil- and gas-heated homes (Figure 4). This is, in part, a result of Seattle City Light's multi-year investment in residential weatherization for electrically heated homes over the last three decades and the historic lack of efficiency upgrade incentives offered to oil-heated homes.

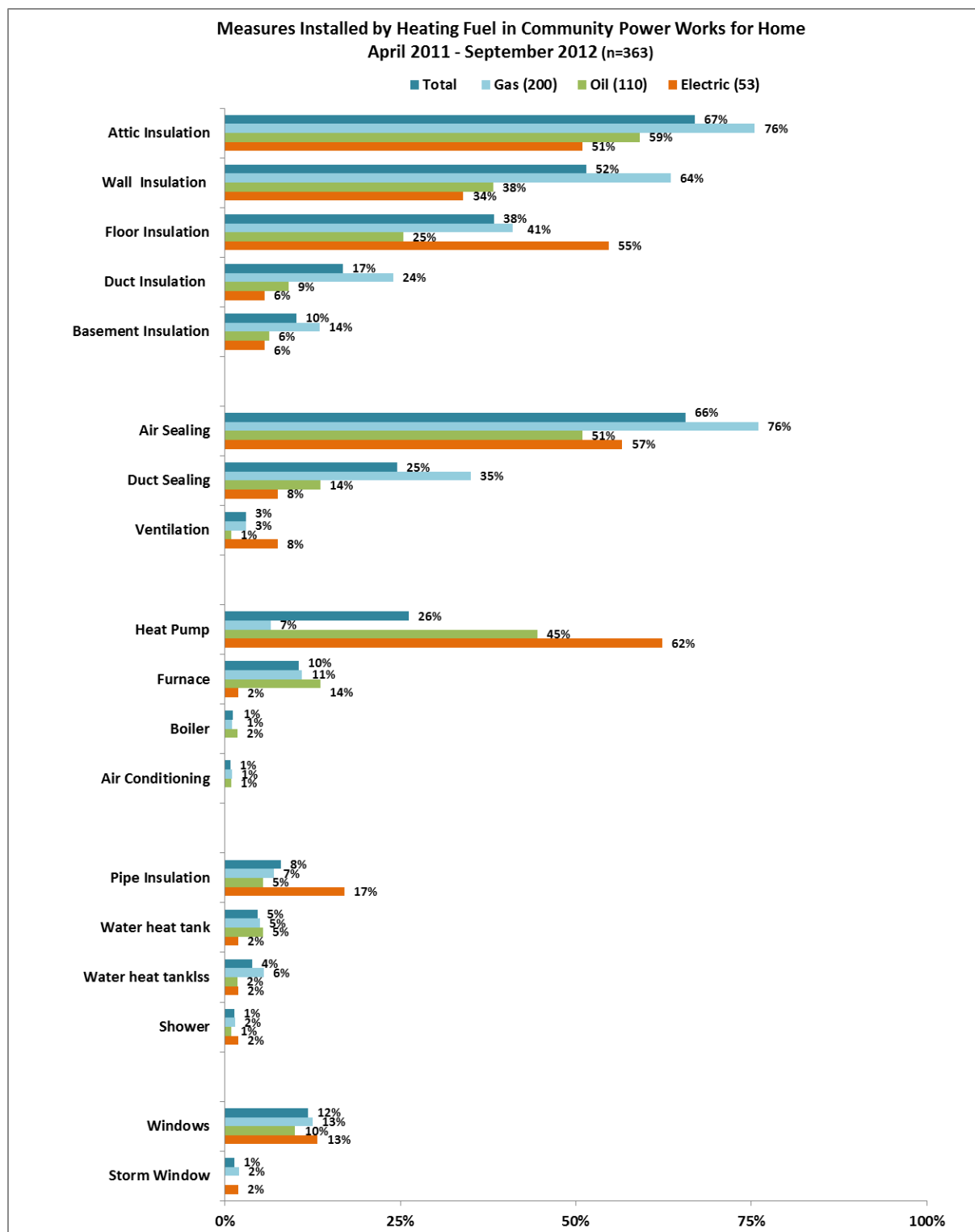


Figure 4. Measure Installations by Fuel Type, April 2011 – September 2012 (n = 363)

Customer satisfaction is high

All homes completing Community Power Works for Home projects are surveyed within a month of project test-out.¹⁰ Participant ratings have been consistently positive, with 85% indicating they would be very likely and 11% somewhat likely to recommend the program to others. Between 85% and 92% of respondents said they were “very satisfied” or “satisfied” with the services provided by auditors, contractors, and OSE and Cascadia Consulting staff.

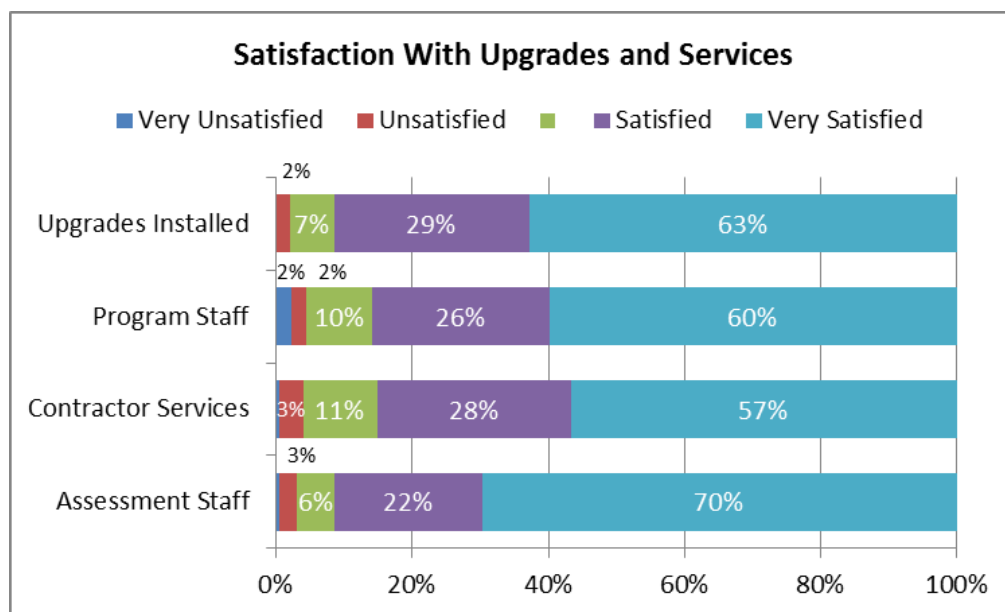


Figure 5. Satisfaction with Upgrades and Services April 2011 – September 2012 (n=204)

Applicant Exit Survey Results

In May and June 2012, the Washington State University Energy Program surveyed a sample of 414 applicants to the Community Power Works for Home program who had been identified as no longer actively participating in the program as of May 14, 2012.¹¹ Key findings from this survey include:

- Almost one in five (17%) respondents thought they were still in the Community Power Works program.

¹⁰ An on-line survey with phone follow-up. Response rate is currently at 67%. A more comprehensive summary of participant survey results will be available in December 2012.

¹¹ A detailed summary of findings is available on request.

- Two out of three respondents (64%) who applied in 2011 indicated they were definitely or possibly interested in reapplying to the program after hearing of 2012 program changes.
- Three of five respondents had a project (often a very specific project) in mind when they applied, such as changing out their heating system or completing a specific insulation project.
- A total of 30% of applicants reported taking efficiency actions after applying. Over half of those taking action (61%) reported measures requiring significant investment (insulation, heating systems or windows). Few of these retrofits appear to be whole-house projects. Only three (8%) of those taking action reported working with a utility program.
- Exiting applicants were a little more likely to be at income extremes, not have children, and be racially and ethnically diverse than those completing projects. These differences were fairly modest.
- Reasons for leaving Community Power Works for Home are complex and interrelated. There is no single most important reason for leaving the program across all who exited. Most of those leaving the program cited more than one reason as very important. General categories in rough order of frequency mentioned included:
 - Personal circumstances changed, currently too busy to schedule or follow-through, or other timing issues (42%).
 - The applicant just wanted an assessment, but not the other services (40%).
 - Affordability: the whole-house requirement needed to qualify for rebates was too costly. Although rebate amounts were an important element that attracted participants, these were usually a secondary reason for dropping out of the program.
 - Program requirements were too complicated and/or consultant services or communications were not satisfactory. These reasons were often closely linked. A smaller percentage reported that consultant/coordination services were not needed and did not add value, and tended to be people with specific projects in mind.
 - Other assessment related concerns: assessment quality, assessment not worth the value.
 - Contractor issues, including contractor selection or lack of follow-through.
 - Loan terms and a complicated process were mentioned least frequently overall, but were an important reason for dropping for those interested in a loan.

Customer Profile

Community Power Works for Home has focused marketing efforts on single-family homeowners who are early adopters and are “values-driven.” These households tend to have higher incomes, are less racially and ethnically diverse, and are more likely to live in older oil-heated homes than the

general population. Part of this difference is attributed to differing characteristics of those who own and those who rent their residences.

It is likely that the income distribution for future Community Power Works participants will remain skewed toward higher-income households because the pipeline summarized in Table 6 includes more high-cost projects.

Table 6. Demographic Comparison of Community Power Works for Home vs. Seattle Households

	Seattle Community Power Works ¹ (n=259)	2010 American Community Survey ² (5-year estimates)
Children 17 or under	34%	20%
Income		
Under \$15,000	0	12%
\$15-25,000	1%	8%
\$25-35,000	4%	9%
\$35-50,000	10%	13%
\$50-75,000	19%	17%
\$75 -100,000	22%	13%
\$100-150,000	26%	15%
Over \$150,000	18%	13%
Race Ethnicity		
Non-white (%)	12%	26%
Hispanic	5%	6%
Heating Fuel (Single Family)³		
Gas	60%	61%
Electric	14%	21%
Oil	26%	16%

¹ Demographic data from Seattle Community Power Works Participant Survey, April 2011 – September 2012.

² Source: Seattle Department of Planning Development, [2010 5-Year Summary Statistics for Seattle](#).

³ Heating fuel from Community Power Works participant tracking data through September 2012. Seattle data based on WSU Energy Program analysis of ACS data.

Cost and Leverage Analysis

Community Power Works for Home moved out of start-up phase in spring 2012. Between April 2012 and June 2012, 115 Community Power Works for Home projects passed test-out (~40 a month). The average unit costs for major Community Power Works services were calculated based on invoices over this period. This approach minimizes costs associated with building infrastructure and start-up.

Current unit costs

The average total cost for a project completed between April and June 2012 was \$17,490. This includes \$10,000 (57%) for the upgrade itself, \$2,190 (12.5%) for value-added services (audits,

quality assurance, customer and contractor support), and \$5,300 (30%) for program management. The \$10,000 upgrade costs include an average homeowner upgrade contribution of \$6,600, utility incentives of \$900 and Community Power Works rebates of \$2,500.

Utility and customer investment leverage rates are increasing

As Figure 6 shows, Community Power Works for Home projects from April through June 2012 are leveraging one dollar of utility or customer investment (\$8,625) for each dollar invested by Community Power Works in services, incentives, and coordination and management (\$8,865).¹²

Unit costs for program management will decrease because they are spread over more units and are likely to drop to 20% to 25% in fall 2012. Decreasing administration costs, coupled with the growing share of higher value and higher investment projects in oil-heated homes and heating systems upgrades (Table 5), will increase the utility and customer dollars leveraged by Community Power Works from \$1 to \$1.50 for every \$1 of Community Power Works investment.

The Role and Contribution of Community Power Works for Home Contractors

The Community Power Works for Home contractor pool

Before they can offer Community Power Works services and incentives, all Community Power Works installation contractors are screened for quality, must certify compliance (or willingness to comply) with HRA standards for wages and training, and must commit to using the EnergySavvy IT platform and other program reporting tools. The OSE contractor application process also provides preferences for contractors who have fewer than 50 employees, are locally owned, have minority or woman-owned business certifications, are veteran-owned, and are employee-owned.

The Community Power Works contractor pool has grown from eight contractors in 2011 to 15 contractors in June 2012. Four contractors have left or were removed from the contractor pool. All 15 contractors have fewer than 50 employees and 14 are locally owned.

Once production hit 50 completed projects a month in the summer of 2012, many contractors reported they were at or near capacity and were booked out from 3 to 12 weeks or more. More contracting capacity was needed if the program hoped to increase production to 75 or more projects a month. The program has aggressively recruited new contractors to the program; as part

¹² Audit costs are based on achieving a 50% conversion rate – two audits are needed to get to one complete project. Project management costs support some of the customer and contractor services. They are split between OSE and Cascadia (17.5 %/82.5%, respectively). OSE's administrative costs are based on 60% of the Community Power Works OSE staff budget. Loan costs only include funds management and administration.

of that effort, OSE developed a simpler, more streamlined application process. As of early October 2012, seven new contractors were added to the pool and one contractor is leaving the pool.

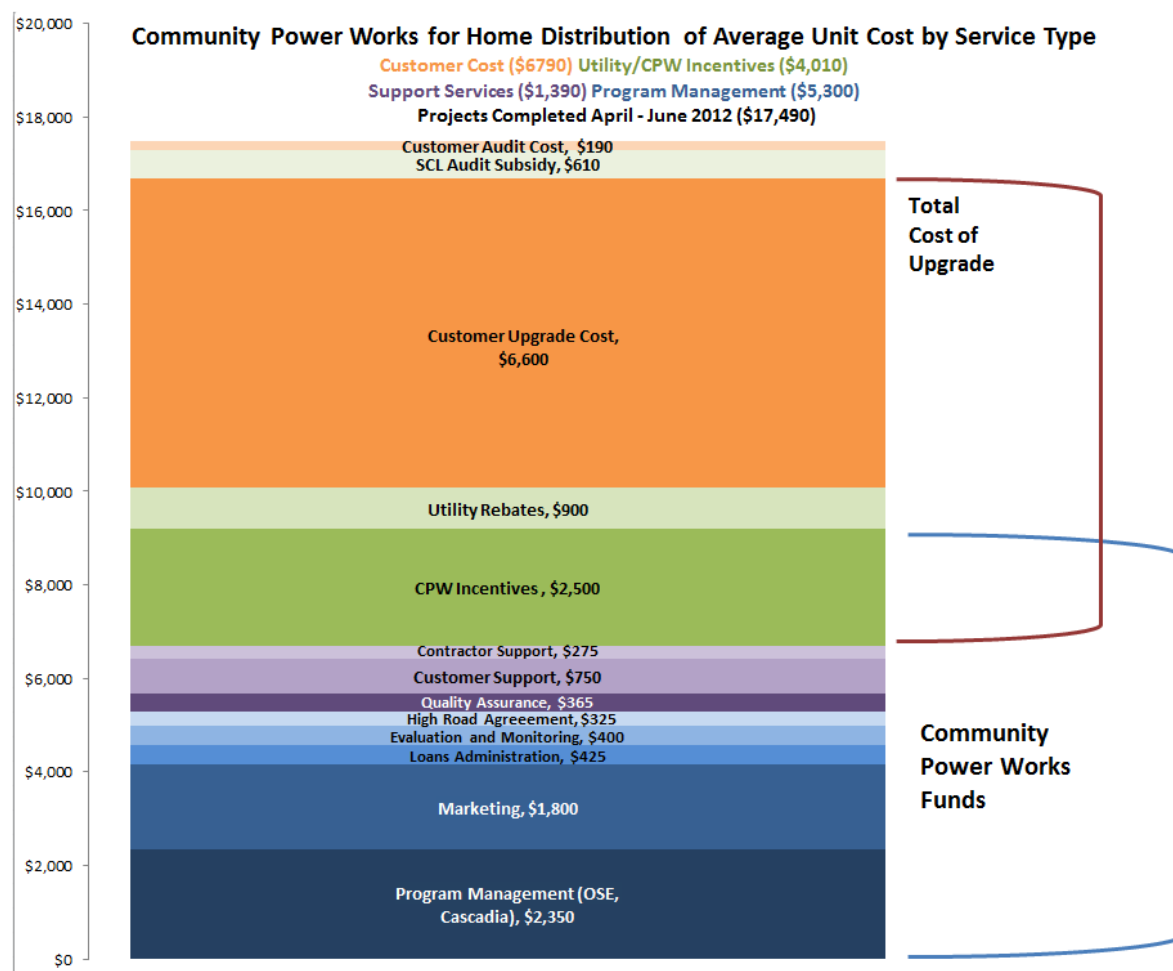


Figure 6. Community Power Works for Home Unit Costs April – June 2012

The contractor experience

Over summer 2012, we conducted in-depth interviews with ten Community Power Works for Home contractors, supplemented with a short on-line survey that all contractors completed. Key findings are summarized below.

- **All Community Power Works contractors reported that the majority of their revenues before the program came from energy upgrade projects**, including insulation, heating systems or whole-house performance. Most reported that less than 10% of revenues came from general or remodel contracting.
- **The majority – 12 out of 15 contractors – had prior experience with other publically funded energy efficiency programs**, including the State Low-Income Weatherization

Program and the Community Energy Efficiency Pilot Project. All had worked previously with utility incentive programs. Contractors with prior experience with other publicly funded efficiency programs consistently rated Community Power Works as easier and more flexible to work with.

- **Most contractors appreciated the willingness of both OSE and the Home Retrofit Coordinator to listen to their concerns and to change and modify the program incentives and processes in response.** The project-based project management and reporting system did not align with one contractor's business model, which bundled multiple projects to gain bidding efficiencies. This required the contractor to make substantial modifications to business processes and decreased the attractiveness of the program to that contractor.
- **The contractors supported program changes, including increased incentives and single bid assignment.** Contractors reported that frequent changes have been hard to maintain and track. There were several requests for a single web location for posting program changes and policies.
- **The most consistently reported process issues were delays and poor communication during test-out, invoicing and rebate disbursement.** These issues directly affect cash flow and cash flow management. Small contractors reported that delays in invoicing and rebate disbursement have a disproportionate effect because cash reserves and business volumes are lower.
- **Seven of nine contractors interviewed indicated they were at or near capacity.** They were unlikely to expand capacity significantly over the remaining months of the program, given the lack of guaranteed work after 2013.

Market Transformation Effects on Seattle's Home Performance Industry

Market transformation effects are difficult to measure because they occur incrementally over long periods of time and may involve many subtle changes. These effects may be the most important and long lasting for the Community Power Works program. While it is too early to definitively establish market transformation effects, we do have a growing body of evidence that assessment and building contractor practices are becoming more efficient and effective.

Contractors reported that **the Community Power Works program has positively affected business practices and operations** in the following ways:

- Getting more experience with comprehensive, whole-house retrofits. Projects were larger and involved more partners.
- Developing new business contacts and relationships within the home performance industry.
- Strengthening marketing and sales skills.

- Improving reporting and project-tracking systems.
- Moving toward better integrating assessment and upgrade services.

A preliminary analysis of conversion rates and upgrade recommendations found that integrating assessment and upgrade services reduced process times by four to six weeks but did not make a significant difference in conversion rates or depth of upgrade.

An independent assessment of the quality of EPS assessments for the first 50 projects completed in 2011 compared to EPS assessments for projects completed in summer 2012 showed significant **measurable improvements in overall assessment quality and for specific auditors** (Attachment 4).

Community High-Road Agreement

Community Power Works contractors were committed to the goals and objectives of the HRA

Contractors did not find reporting requirements to be unreasonable or too stringent to meet. The concern was that reporting and compliance assessments were not sufficiently rigorous for other contractors. Contractors wanted assurance that all other contractors were playing by the same rules to ensure a level playing field.

Contactors felt that a strong, consistent and transparent compliance monitoring system was essential and not overly burdensome

Most data on labor hours, wages and workers is already captured for other purposes. Recent improvements to streamline the Community Power Works wage and work reporting system (i.e., integration with the EnergySavvy IT platform) have further reduced the reporting burden.

A detailed review of compliance for all projects completed through August 2012 has found close to 100% compliance for reporting, wage payments, and meeting training and certification requirements

The few cases that were found to be non-compliant were traced back to data errors or miscommunications over appropriate worker classifications or wage rates that, when corrected, returned cases to compliance. We are conducting random site visits to match reported data to contractor records.

Workforce Outcomes

Participating contractors have provided close to 100% reporting of all construction labor hours for Community Power Works for Home upgrades by worker classification, wage and worker

demographics.¹³ This comprehensive accounting allows for a detailed and accurate assessment of progress toward HRA targets. Progress is reported quarterly in a detailed dashboard (Attachment 5). Highlights include:

- As of September 30, 2012, more than 202 workers worked a total of 25,030 technical hours on Community Power Works for Home projects.
- Contractors have added 95 new hires since April 2011. Most of the new hires were returning experienced workers, but 33 were new entry-level hires. Of these, 16 are currently employed by HRA as primary contractors, four were severed and five are working as sub-contractors.
- The Community Power Works workforce currently includes 28 graduates of qualified training programs,¹⁴ 23 of whom have been retained in the Community Power Works for Home worker pool. Three graduates were hired and let go or left in the first week of employment.
- Targeted workers provided 42% of technical hours.¹⁵ Diversity is greater in lower-paying classifications such as weatherization worker (Figure 7).

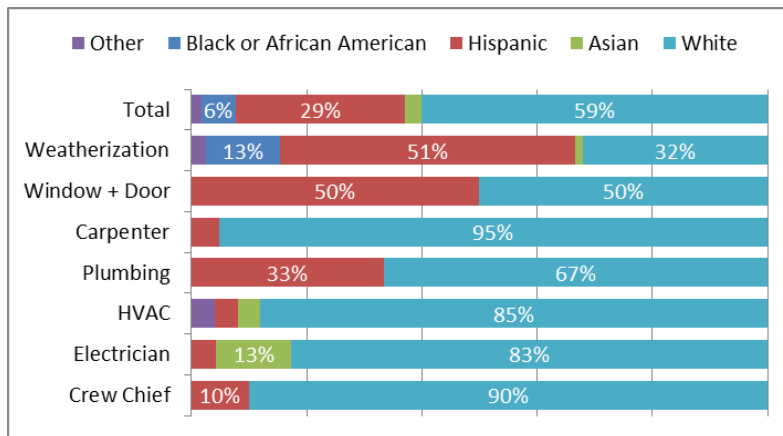


Figure 7. Total Workers by Job Classification and Race/Ethnicity, April 2011 – June 2012 (N=155)

We have summarized the first year of data in *Community Power Works for Home: Summary of Technical Worker Characteristics April 2011 – June 2012* (Attachment 6).

¹³ Construction labor hours are also referred to as technical labor hours in the Community High-Road Agreement.

¹⁴ The Community High-Road Agreement encouraged HRA contractors to hire graduates of qualified weatherization training program as new entry-level employees. Qualified training programs include programs at South Seattle Community College and LIUNA.

¹⁵ A targeted worker is defined as any of the following: low-income individuals, veterans and current members of the National Guard and Reservists, or individuals with barriers to employment.

HomeWise Low-Income Efficiency Upgrade Program Partnership

OSE partnered with the Seattle Office of Housing (SOH) HomeWise program, which delivers state, federal and utility-funded low-income weatherization programs in the City of Seattle. As a result of the American Recovery and Reinvestment Act of 2009 (ARRA) and DOE funding over the last several years, the SOH HomeWise program had developed an effective and proven delivery system for weatherization of single- and multi-family units. Community Power Works funding helped address two critical needs:

- For the HomeWise single-family program, Community Power Works provided flexible funding that could be used to convert oil-heated homes to more economical and environmentally beneficial fuel sources. State, federal and utility funding comes with conditions that restrict what types of projects can be funded. For example, utility and federal low-income weatherization funding cannot be used for heating system upgrades that involve fuel switching.
- HomeWise identified significant unmet needs for weatherization of other low-income, multi-family properties as ARRA and other DOE weatherization funding was getting much tighter.

This partnership with the SOH provided Community Power Works access to a tested system that could deliver:

- High-quality upgrades to help meet residential upgrade targets, and
- Benefits to low-income households to help meet Community Power Works' social equity commitments.

HomeWise Single-Family Program

Community Power Works is providing HomeWise with:

- \$50,000 to cover the costs of completing EPS assessments and other reporting required of single-family, low-income projects in the Community Power Works service area.¹⁶
- \$200,000 for conversions for high-efficiency heating systems that may not be eligible for funding through other programs.¹⁷

All single-family homes weatherized through the HomeWise program in the Community Power Works service area are counted toward Community Power Works' single-family weatherization targets. As of September 30, 2012, SOH had completed 153 upgrades in the Community Power

¹⁶ \$250 per single-family home for up to 200 homes

¹⁷ 40 HVAC upgrade projects, assuming an average per-unit cost of \$5,000

Works service territory. This accounts for 30% of the completed single-family upgrades in the Community Power Works service area. An additional 55 upgrades are in process.

As illustrated in Table 7, SOH HomeWise single-family upgrades are achieving roughly the same levels of energy savings as Community Power Works for Home upgrades. Direct comparisons should be made with caution because eligible measures and costs differ. For example, HomeWise single-family upgrades include low-cost lighting and appliance replacement measures and significant costs for health, safety and repair measures. All low-income weatherization measures must meet standards for cost-effectiveness. Community Power Works for Home pays incentives based on the percentage of savings achieved. While incentives are capped, project costs are not. As noted in Table 7, average costs for the Community Power Works for Home program are increasing.

Table 7. Community Power Works for Home and Seattle HomeWise Single-Family Upgrade Comparison – Projects Completed Through September 30, 2012

	Community Power Works for Home	HomeWise Single Family
Average Cost (Measure and Labor)	\$9,156 ¹	\$9,228 ²
Average Estimated EPS Energy Savings	29.2%	32.3%
¹ Measure and labor costs, excluding taxes		
² Includes health, safety and weatherization-related repair		

HomeWise Multi-Family Program

In keeping with Community Power Works' initial objectives, the program initially looked to partner with Seattle City Light to develop new strategies and with non-profits, like the Enterprise Community Partnership, to establish a financing vehicle to support multi-family energy efficiency upgrades. After exploring these options further, Community Power Works came to the conclusion that the multi-family market in Seattle was very challenging and that the initial proposed strategies would not be able to deliver completed projects within the grant period because:

- Seattle City Light had provided weatherization services to many electrically heated multi-family buildings that were not eligible for low-income program funding. The utility believed much of the weatherization potential in this sector had already been harvested. OSE is supporting Seattle City Light's efforts to characterize remaining upgrade potential in all multi-family buildings. This analysis will be available in 2013.
- Initial efforts to find non-profit partners who were able to deploy energy-efficiency upgrade financing services for multi-family buildings and deliver signed upgrade agreements under program timelines were unsuccessful.

Instead, OSE decided to partner with SOH, which had a tested delivery system in place that was consistent with Community Power Works' goals.

The HomeWise multi-family program provides weatherization grants to owners of multi-family properties where at least 51% of the residents are low-income. HomeWise grants may cover all or a portion of the cost of the weatherization measures. The HomeWise program took a whole-building approach to multi-family properties. Measures can include attic, wall and crawl space insulation (including crawl space ground cover); ventilation and indoor air quality measures; air sealing; duct insulation; heating systems; and hot water heating systems.

OSE started discussions with the SOH in 2011 and signed a formal agreement in early 2012. As of September 30, 2012:

- \$170,163 in funding from Community Power Works has been expended in 12 projects with 542 units. These projects are heavily leveraged with other funding sources (Figure 8).
- An additional \$27,000 in Community Power Works funding has been committed to six projects with 66 units under construction.
- Proposals are being prepared for work in 27 multi-family complexes with over 900 total units.

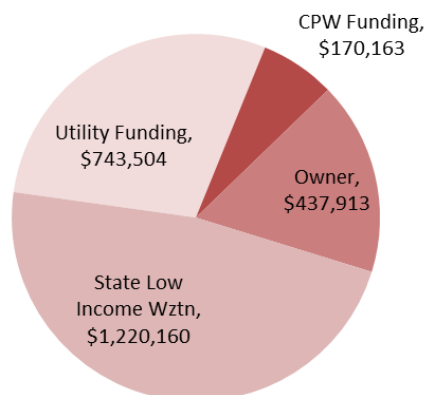


Figure 8. Funding Mix for Community Power Works Multi-Family Projects Reported as Complete through September 2012

Community Power Works for Small Business

Community Power Works for Small Business was launched in October 2011 with an original target of 120 completed upgrades of small retail and restaurant establishments. The business retrofit coordinator, Cascadia Consulting, offered the following services, incentives and benefits:

- Intensive door-to-door business canvassing to screen and sign up businesses for assessments.
- Free energy assessments using an assessment tool developed for small restaurants and retail.
- \$1,000 incentive to each participating business and an additional \$1,000 to the first five businesses to sign a bid if energy savings exceeded 15 percent.
- Loans with a 4% interest rate and no closing costs or loan fees for loans under \$50,000. (Loans larger than \$50,000 receive \$1,500 toward closing costs.)
- Access to the pre-approved contractor pool.

In the first six months of the program, 356 businesses were contacted, 44 assessments were completed and one bid was signed. There has been no interest in loan financing. Three- and six-month reviews conducted by Community Power Works identified several challenges in the roll-out of the program:

- High levels of staff turnover on the delivery and outreach team.
- A small pool of three contractors with limited experience in working with small businesses
- Difficulty coordinating with utilities to obtain the data required to complete assessments.
- The assessment tool did not initially include HVAC measures.
- Very few businesses had the potential to achieve 15% energy savings and did not qualify for incentives. Those that could save 15% required very large investments that, in most cases, were well beyond the financial resources of the business owners.
- Initial outreach and the assessment visits did not screen for interest in the program or whether the business owner was likely or able to invest in efficiency upgrades. Contractor referrals were low quality. Most business owners did not own the building or have the long-term business stability or capital position to make loans a viable option.
- Both Seattle City Light and Puget Sound Energy have had long-running rebate programs targeted to the small business market. Much of the projects that were easier to capture had already been targeted.

In response to these challenges, Community Power Works and Cascadia Consulting made several program changes in the spring of 2012:

- The service area was expanded city-wide.
- The incentive structure was changed to match (or double) existing Seattle City Light incentives, which are \$.25 per kWh.¹⁸ HVAC options were added to the assessment tool.
- Outreach and assessment staff put more focus on screening likely applicants.
- Three new contractors were added who have specialized experience in HVAC, refrigeration and restaurant remodels.
- Small business targets were adjusted to emphasize fewer higher-quality upgrades.

These changes have resulted in progress toward the stated goals of this program. Thirteen bids totaling \$180,081 have been signed and six upgrades have been completed. The pipeline also includes a whole-building upgrade that involves multiple businesses.

Table 8. Community Power Works for Small Business at a Glance

	Total	Restaurant	Retail
Number	13	9	4
Average Bid	\$13,852	\$13,992	\$13,537
Average Community Power Works Incentive	\$6,180	\$6,016	\$8,731
Average Utility Incentive	\$2,461	\$1,966	\$4,559
Average Energy Savings	13.1%	9.6%	21%
Carbon Savings (MTe)	14.1	10.8	21.7
Most Common Measures	Lighting, refrigeration, cooking	Lighting, kitchen, refrigeration, cooking	Lighting, refrigeration displays

¹⁸ Incentives were capped at a total of \$15,000 per project and 90% of project costs.

Community Power Works for Hospitals

Community Power Works for Hospitals provided support to four Seattle area hospitals to improve the energy efficiency of their facilities. The four hospitals are Group Health Cooperative, Harborview Medical Center, Swedish Medical Center and Virginia Mason Hospital and Medical Center. Community Power Works for Hospitals consisted of two components: one-to-one matching grants (up to \$75,000) to develop Strategic Energy Management Plans (SEMP) and Carbon Reduction Incentive Funds (CRIF) to assist with the cost of energy-efficiency improvement projects.

- **SEMP** – To access the CRIF dollars, the hospitals completed a SEM. As described in the Community Power Works for Hospitals request for proposals, “A SEM is an actionable document that identifies the current energy baseline use at a facility, creates a goal for energy consumption reduction, and lays out a plan of how to achieve this reduction.”
- **CRIF** – The CRIF was intended to provide up to \$2.1 million in incentive dollars to support cost-effective energy efficiency retrofits. Incentive payments were based on the metric tons of carbon dioxide (MtCO_{2e}) equivalent reduced by the project. These carbon reductions occur as a result of energy savings. The CRIF dollars were to be awarded in two phases. In Phase 1, hospitals could apply for up to \$250,000 each of incentive funds from November 22, 2010 to April 29, 2011. All remaining funds were to be awarded on a competitive basis in Phase 2. Applications for Phase 2 were due June 15, 2011. Projects were expected to realize 15% energy savings and CRIF funds were not to exceed 10% of total project cost.

Overview of Projects

As detailed in Table 9, Community Power Works for Hospitals provided a little over \$500,000 for the SEMP and CRIF energy-efficiency projects at the four Seattle-area hospitals. Total costs for the five projects exceeded \$5.6 million. Community Power Works’ incentives covered about 6% of this cost. Annual carbon savings was estimated at over 1,250 tons.

There was a wide range in project costs, from \$2.6 million to \$340,000. Four of the projects dealt with fans, air handlers and ventilation systems. One involved boiler and steam system improvements. Energy savings were split among electricity, natural gas and steam, with electricity accounting for the smallest share. One of the projects saved only electricity, one saved mostly natural gas, and the rest were split between electricity and steam savings, with steam being the largest share in two cases.¹⁹

¹⁹ This comparison of savings is based on using common energy units for each of the fuel types.

Table 9. Summary of Community Power Works for Hospitals Projects

Hospital	SEMP Community Power Works Match \$	Project Description	Total Project \$	CRIF \$	Carbon Savings (MTe)
Group Health	75,000	Boiler optimization and steam trap replacement	343,173	333,816	225
Harborview	61,000	Surgical unit fan replacement	1,556,816	67,672	252
Swedish	28,202	Main surgery air handler upgrade	2,600,000	142,713	442
Virginia Mason	15,074	VAV* system controls and boxes upgrade and replacement	640,000	50,397	202
Virginia Mason		Main hospital fans	548,490	28,553	133
Total	179,276		5,688,479	323,150	1,254
* Variable air volume					

Key Findings

- **The hospitals said the support from Community Power Works to develop the SEMP was valuable.** This support allowed the hospitals to merge information from different places into one document, helped identify and prioritize energy projects, aligned energy projects with their capital plans and facility master plans, and provided a way for them to track their progress. They view the SEMP as living documents and hope to update them in the future.
- **The hospitals used CRIF support for energy-efficiency projects already in their capital plans or being considered for implementation.** Five energy-efficiency projects in the four hospitals are expected to be completed with Community Power Works support.²⁰ While all of these projects were already planned, in a few cases CRIF support allowed them to do more sooner.
- The hospitals took advantage of a small portion of the CRIF (\$323,151 of the \$2.1 million available).
- Factors cited to explain why the hospitals did not pursue more of the available funding are:
 - The **timelines were too short** to develop projects.
 - Their capital funds were already allocated to other projects.
 - The **incentive was too small** to motivate them to identify other projects.

As one hospital staff person said, to use the \$2.1 million CRIF, the hospitals would have needed to generate over \$20 million in capital projects in a year or so. They did not have the capital funds or the capacity to implement this volume of work in such a short period.

²⁰ As of summer 2012, three of these projects were complete.

A detailed discussion of lessons learned is provided in the Community Power Works for Hospitals report (available by request from the WSU Energy Program).

Community Power Works for Large Commercial

Community Power Works for Large Commercial was intended to test whether a financing model that reduced out-of-pocket costs to zero and resulted in positive cash flow would encourage building owners to invest in comprehensive energy-efficiency upgrades with paybacks of up to 10 years.²¹ Community Power Works and its partners developed an innovative financing package that included:

- \$1.8 million for the Carbon Reduction Incentive Fund (CRIF), with rebate payments based on the amount of carbon savings.
- \$645,000 for the Sustainable Investment Fund, a source of equity financing.
- \$322,500 for a debt service reserve fund to reduce financing costs.
- An on-bill payment option through the Seattle Steam to assure positive cash flow.
- A performance guarantee in the form of a signed Energy Services Agreement (ESA).²²

The Community Power Works financing package was supplemented by:

- Over \$2 million in debt service reserve financing from the Energy Efficiency and Conservation Block Grant (EECBG) administered by Washington State Department of Commerce.
- Utility incentives for projects with electric and natural gas savings.
- Technical assistance on structuring energy efficiency project financing packages to capture tax and other financing benefits.
- Assistance with energy benchmarking tools like ENERGY STAR Portfolio Manager.

The initial offering targeted about 200 large commercial buildings in the area of downtown Seattle served by the Seattle Steam. MacDonald-Miller Facility Solutions (MMFS), a firm specializing in building operations and performance services, worked with Energy Efficiency Finance Corporation to develop the financing models and to establish MacDonald-Miller Energy Capital Solutions, which had an exclusive relationship with Seattle Steam to develop and manage energy project financing

²¹ The original offer specified that projects must reduce total building energy use by 15% or more, per U.S. Department of Energy program guidelines

²² Because incentives were paid based on estimated energy savings, all projects required a signed Energy Services Agreement or third-party verification.

and payment systems. MMFS developed the projects and provided the energy services to guarantee saving.

The initial large commercial offer did not attract many early adopters. The first \$2.8 million of seed capital was expected to generate \$10-12 million in energy-efficiency upgrade investments. The first large commercial project, the Washington Athletic Club, was completed in May 2012. The project

- Totaled 300,000 square feet.
- Involved a total investment of \$890,700 for a major HVAC system and controls upgrade, demand-based kitchen ventilation, pipe insulation, and return fan variable frequency drives.
- Estimated to reduce site energy use by 29.1% and annual carbon emissions by 1,058 TGe (metric ton carbon equivalents).

A second project of 110,000 square feet is under construction.

Program partners identified several factors that contributed to low response to the initial large commercial offer:

- **Uncertainty in the overall economic environment and the commercial real estate market at the outset of the program.** This increased the risks associated with making long-term capital investments and delayed the timelines and processes for making decisions.
- **Lack of familiarity with the new financing model among large commercial property owners.** The Community Power Works model included new financing tools (carbon incentives and on-bill payment), offered in new configurations through entities with new and unfamiliar roles (the City of Seattle and Seattle Steam). The underlying paradigm shift – positioning energy efficiency upgrades as a new revenue stream rather than as a long-term investment with a payback – was challenging. The program underestimated the difficulty and time needed to establish relationships and introduce a new model to key decision-makers.
- **Lack of channels to executive decision-making.** Moving these projects forward requires engaging and getting sponsorship and authorization from executive officers, which may include the chief executive officer, chief financial officers, chief operating officers, and senior property manager, depending on the project. MacDonald-Miller's primary expertise and relationships were with building operations and management. The other Community Power Works partners did not have an organized strategy for bridging the gap between operations and the executive suite.
- **The scale and complexity of large commercial upgrades and decision-making process around them.**

- The financing mechanisms and energy services agreement model required negotiation of complex, multi-year service, legal and financing agreements. Each of these involved multiple parties, many of which have competing priorities.
- Most large commercial building owners and operators have structured processes and timelines for approval of major capital investments. These drive the decision-making process. Missing the window can delay approval by one or more years.
- Ownership, lease structures and the building life (physical condition) differ dramatically among projects. These differences require custom solutions and are major drivers of “organizational readiness” to proceed.
- Once an agreement is signed, additional time (from 3 to 12 months) may be needed for final design, engineering, contracting, sub-contracting, installation and testing.
- **The initial requirement for comprehensive upgrades that achieved 15% or more energy savings increased the complexity of an already complex process.**²³ While comprehensive upgrades are technically feasible, if the upgrade is extensive, construction schedules may be delayed to minimize disruption to operations.
- **Lack of coordination among marketing and delivery partners.** A lot of collaborative partners²⁴ can complicate and slow negotiations and make it difficult to maintain consistency in communication. Coordination with utility partners was mixed. MacDonald Miller worked closely with Seattle Steam and engaged Seattle City Light and Puget Sound Energy on specific projects. Seattle City Light and Puget Sound Energy – were not initially engaged as strategic partners. The lack of a structured coordination process made it difficult to “keep the story straight.” Coordination challenges were exacerbated by limited staffing capacity at the OSE.
- **Eligibility for services was limited to approximately 200 Seattle Steam customers in downtown Seattle Core.** The pool of eligible properties may have been further restricted by the use of MacDonald-Miller as the exclusive service provider. Building owners with promising projects in buildings that were managed by other building services companies would have to break long-standing contracts to take up the offer. Future evaluation will explore this issue in more depth.

²³ It is not known the degree to which the requirement for upgrades to reach a minimum of 15% savings posed a barrier to moving these projects forward. This question will be addressed in upcoming evaluation research.

²⁴ Initial partners included the City of Seattle, MacDonald-Miller, Emerald City Group, Seattle Steam, the Energy Efficiency Finance Corporation and Cyan Strategies. New partners added in 2012 included the Seattle 2030 District, Seattle City Light, Puget Sound Energy, The Justen Company (consultants to MacDonald-Miller) and Gunther Media.

Large Commercial Redesign

In response to low take-up of the initial offer, the program and its partners made a major effort in the spring and summer of 2012 to redesign the large commercial program. Key elements included:

Developing a deeper understanding of business requirements, internal return on investment (ROI) hurdles that building owners evaluate before undergoing energy efficiency work, and internal project approval processes.

- The City sought expertise from those with experience working with “the executive suite.” As part of that process, the Seattle 2030 District was brought in to coordinate outreach and help manage the pipeline.
- MacDonald-Miller brought in the Justen Company, a firm with significant experience with developing large commercial projects and working with executives to help bridge the gap.

Streamlining and coordinating service delivery among the delivery partners.

- In June 2012, MacDonald-Miller brought in resources to coordinate and manage the Seattle Steam project pipeline. As part of that effort, MacDonald-Miller launched an intensive strategic review/triage of the Seattle Steam project pipeline. The goal of this project was to identify five projects that were ready to commit to moving forward by the end of July.²⁵ Ten projects were signed, one of which was later dropped because they were ineligible for Community Power Works funding.
- Regular bi-weekly coordination meetings were established.
- Seattle City Light and Puget Sound Energy were brought into the process.
- On-going management of carbon reduction incentives was shifted to the Seattle 2030 District.

Establishing awareness of a new financing model and understanding how to introduce it to building owners.

- The Seattle 2030 District was given lead responsibility for outreach and for long-term continuation of Community Power Works for Large Commercial services because the Seattle 2030 District and its members see deep market value in the tools and process that have been put together for this program.

²⁵ A commitment was defined as getting a signed PDEA – a professional agreement to move forward with a preliminary energy analysis. This is free if the client continues to move forward in the process, but must be repaid if they drop out of the program.

- As part of this effort, the Seattle 2030 District recruited principals from the first completed project at the Washington Athletic Club to participate in a video case study and assist with peer-to-peer outreach.

Providing a “special offering” for Seattle Steam customers.

- This offer involved higher incentives which, in turn, drove down the cost of capital to better match the ROI thresholds that building owners require for moving projects forward.

Expanding eligibility for carbon reduction incentives.

- In August 2012, the eligibility was expanded from approximately 200 large buildings in the downtown core to over 1,500 buildings in the Seattle 2030 District.
- Projects that involve significant energy savings on a building system level but do not result in 15% building-wide savings are being considered on a case-by-case basis.

Movement in the Large Commercial Pipeline

The program’s delivery partners are reporting increasing movement and momentum in the large commercial pipeline since the summer of 2012.

- Six new projects in the Seattle 2030 District have started the application process.
- Ten Seattle Steam projects have taken the next steps in the conversion process.
- As of October 30, 2012, six projects totaling 1.3 million square feet were in final negotiations for ESAs (see Table 10).
- Property owners have signed agreements committing to completing investment-grade audits in six buildings totaling over 2.2 million square feet.

Table 10. Summary of Community Power Works Large Commercial Pipeline, October 2012

Stage	Projects (#)	Square Feet	Total Project \$	Community Power Works Rebates ¹
Completed	1	300,000	890,700	161,427
Under Construction	1	110,000	193,600	-
Energy Services Agreement	5	1,317,000	5,736,100	697,448
Investment Grade Audit	6	1,307,800	5,045,600	600,600
Considering PDEA	15			
Application	8			

¹ Includes Seattle 2030 District rebates, carbon reduction incentives and non-profit bonuses

While this recent movement in the large commercial pipeline is very encouraging, it is too early to draw conclusions about the success or viability of Community Power Works large commercial financing services models. It is clear that:

- Although energy savings, incentives and financing services do matter, these benefits have limited power to drive upgrade decisions in complex facilities on their own.
- Moving large commercial projects forward requires close coordination, long-term technical support, targeted marketing and/or incentives to help building managers better position efficiency projects for internal approval or to incorporate efficiency options in ongoing capital improvement cycles.
- A significant, early and continuous investment is needed to build and then maintain organizational readiness to make major investments in energy efficiency in the large commercial sector.

Lessons Learned Across Community Power Works Initiatives

In 2009, the City of Seattle committed to pursuing an ambitious, comprehensive and innovative community-based approach to increase energy efficiency, reduce carbon emissions and spur economic activity city-wide. The city set a very high bar for success and offered an aggressive time table. Community Power Works has reached for – but has not yet reached all of – its original aspirational goals for spurring investment in energy efficiency upgrades.

Community Power Works is now on track to meet revised and more realistic upgrade targets. More importantly, the city has succeeded in developing, testing, deploying and adapting several new strategies, partnerships and tools so it can:

- Use community-based approaches to supplement utility-funded energy efficiency upgrade programs, and
- Build local demand and capacity for energy efficiency.

Some strategies worked, others did not. However, all are being documented and evaluated so the city and its partners in the community and across the country can sustain the best and discard the rest.

Managing Projects in Multiple Sectors is Complex

Community Power Works is unique among all Better Buildings Neighborhood Program projects in that it attempted to launch initiatives in six building sectors at the same time. But it soon became clear that the city did not have the staff, time or capital to effectively launch all six sectors at once, given that all the initiatives were being built from the ground up. The City of Seattle deferred launches of the small business and multi-family sectors until fall 2011. The small business program was under-capitalized and the City of Seattle's Office of Sustainability and Environment (OSE) role in the municipal sector was limited to policy support.

Conversely, a diverse sector portfolio spreads risk. Resources targeted to sectors or programs with lower demand can (and are) being reallocated to sectors with higher demand.

Keep program design and delivery simple

The complexity of the program's original design, incentive and delivery models was a major barrier to customer and contractor participation in all sectors. A continuous focus on simplifying and stream-lining program design and delivery was essential to turning these programs around.

Community-based approaches allow a broader vision, goal set and partnership model

Several factors propelled this drive to develop community-based energy efficiency pilot projects. While existing, utility-funded energy efficiency programs were effective at delivering upgrades that met narrowly defined cost-effectiveness tests, broader partnerships across multiple sectors were anticipated to:

- Allow greater flexibility and consideration of more benefits,
- Build a broader base of support, and
- Encourage more investment from partners and the community.

The benefits of the Community Power Works program that was most consistently mentioned in interviews with stakeholders, partners and contractors in all sectors included better coordination, new connections and partnerships. Labor and worker-training programs report they are coordinating better with contractors. Contractors report they are developing new relationships with subcontractors to deliver whole-house retrofits.

However, this advantage comes with significant risk. A more ambitious set of goals requires making trade-offs in program design, which makes it challenging to set, establish or communicate priorities, and often leads to a proliferation of targets and the consequent loss of clear focus. This risk is greater for government and other entities with large numbers of stakeholder groups. This has been a consistent challenge for Community Power Works, from start-up to its current efforts to craft a sustainability plan.

Community-based programs can focus on filling gaps and addressing underserved markets

Community Power Works has demonstrated that there are gaps in programs to support and encourage investment in energy efficiency. The program has been most successful when focused on filling those gaps and complementing – rather than competing with – existing programs. Examples of filling gaps include:

- **Focusing marketing and incentives on oil-heated homes.** There has been no assistance for energy-efficiency upgrades for oil-heated homes since the mid-1990s.
- **Encouraging quality air-sealing when appropriate in Community Power Works for Home upgrades.** This measure had not been routinely included in existing utility incentive programs.
- Providing the Seattle Office of Housing (SOH) with additional and more flexible funding to supplement existing federal and utility grants for single- and multi-family residences. Utility and some federal grant funding often comes with constraints that do not always allow for making upgrades that make sense to the occupant.
- Providing grants to support comprehensive, all-fuels Strategic Energy Management Plans (SEMPs) for hospitals.

Time, Long-Term Relationships and Investment are Required

The city and many of its community partners underestimated the lead-time required to build a program model, provider network and support services from the ground up.

The investment the city made in building relationships, partnerships, contracts and trust since applying for the grant in February 2010 is only now beginning to pay off. It takes longer to build capacity, relationships and agreements in complex operating and contracting environments.

Long-term relationships are crucial for supporting energy efficiency investments in non-residential buildings. These projects require developing a deep understanding of business needs and willingness to synchronize investments and support with multi-year capital improvement budgets. In recognition of this need, OSE is transferring stewardship of the Community Power Works Large Commercial program to the Seattle 2030 District, a non-profit with a mission of working with these clients over the long-term to achieve the aggressive energy efficiency targets set out in the 2030 Challenge.

The Community High-Road Agreement Model was Successfully Deployed in Community Power Works for Home

The process for developing the High-Road Agreement (HRA) model, while laborious, helped establish relationships and trust among contractors and agencies. Most contractors supported the goals behind the HRA. Those with experience with state and federal prevailing wage requirements uniformly preferred the flexibility and responsiveness of the HRA model. Contractors felt that if HRA standards were deployed, it was essential to have a comprehensive, consistent and transparent monitoring process to assure all contractors were operating on a level playing field. The online reporting system deployed in the summer of 2012 was easy to use. The city was seen as having an ongoing role in establishing and maintaining HRA standards and certifying contractor compliance.

Balance Long-Term Market Demand and Capacity with Short-Term Outcomes

It is important to balance the investment skills, tools and knowledge needed to build long-term capacity with the successful achievement of short-term production and economic outcomes. The benefits of building capacity are hard to quantify but may be Community Power Works' most valuable outcome and significant legacy.

Initial results indicate that Community Power Works for Home is building and strengthening the home performance industry and workforce. Auditors have measurably better skills, crews are better trained and more experienced, the contractor network is stronger and more interconnected, and the local workforce training providers are more directly linked to contractors.

Community Power Works for Home supported the development, deployment and testing of new online tools for encouraging and managing energy efficiency upgrades. EnergySavvy, the Seattle-based firm that developed the information technology solutions behind Community Power Works for Home, has leveraged the experience and solutions developed for this program to help create tools and products for managing energy efficiency upgrades that are delivered to clients around the

country. EnergySavvy is hiring and attracting investment capital. Similarly, the Earth Advantage Institute's Energy Performance Score assessment tool, which is a central feature of the Community Power Works for Home and Seattle City Light home assessment projects, is being adapted by utilities and community programs around the country. This fall, Earth Advantage Institute launched a corporate spin-off, CakeSystems™, to further spread adoption of this tool.

Municipal government agencies do not have the administrative capacity, flexibility or long-term stability to deliver community-based energy efficiency services

OSE must operate under significant limits and requirements regarding the services it can provide, who it can hire and what it can contract for. These requirements place a significant drag on decision-making and service delivery. Most Community Power Works positions at OSE were temporary (or project) positions limited to the duration of the grant. This made it difficult to find and keep qualified and motivated staff. Three of six OSE Community Power Works positions have turned over since the program began.

Almost all of the Community Power Works stakeholders and partners who were interviewed reported that OSE was very responsive and creative in dealing with grant requirements, which imposed significant costs in the form of additional paperwork, hiring and contracting delays.

The city and OSE recognized this challenge early on. As Community Power Works undertakes sustainability and transition planning efforts, a central focus has been finding successor organizations and partnerships to carry out the work and potentially have more flexibility and a leaner decision-making process and cost structure. It is important to note that OSE has been effective at encouraging development and testing of new services and models to encourage investment in energy efficiency upgrades.

Benefits and Limitations of Monitoring and Evaluation Systems

Community Power Works made a significant investment in systems to collect, manage and report data. Critical investments included:

- A contract with EnergySavvy to develop a comprehensive web-based IT platform for Community Power Works for Home. The EnergySavvy platform provided comprehensive intake, project management services, data and real-time analytics services and was an integral part of program service and delivery.²⁶

²⁶ The EnergySavvy platform was rolled out in phases with early iterations focused on core program delivery functions and later versions that included improved reporting and analytics. A more thorough assessment of the role of the Energy Savvy platform and lessons learned will be included in the final evaluation.

- A three-year contract with the Washington State University (WSU) Energy Program to collect data, support reporting and provide comprehensive evaluation services was put in place at the beginning of the grant.

The decision to seek out evaluation services early in the program's implementation enabled the WSU Energy Program team to participate in the program design so that data collection and reporting were wired into the program design and capitalize on creative synergy. For example:

- A partial participant survey was developed in time to test response to new program changes and included an option for survey respondents to request follow-up for remarketing.
- The Community Power Works for Home participant exit survey included ratings for specific contractors. Contractor rating and customer comments were fed back to contractors to help them improve their services and understand how their performance compared to other contractors.
- The WSU Energy Program evaluation team was regularly included in design team meetings, which allowed for short cycle, "just-in-time" assessments and reporting that could be customized to address specific design and sustainably questions.

The early availability and integration of data collection and reporting into the program were key contributors to the program's adaptive management style and rapid response to lessons learned.

One of the program's visions was having a centralized, real-time system for tracking and reporting results across all program sectors. This is very difficult and costly to pull off in a decentralized, multi-partner delivery system. To address this challenge, the WSU Energy Program developed an on-line progress report (Attachment 3). By fall 2012, this progress report was being updated every three to five weeks (not daily or weekly as originally envisioned). Implementation barriers were:

- The large number of partners and differences in data type, quality and reporting systems precluded a centralized system.
- Key data on costs, measures installed and projected savings was often not secured until after projects were closed, which resulted in significant reporting lags. Reporting cycles differ by sector.
- Each sector required separate negotiations to secure data. Some of these negotiations took over a year to complete.

Attachment 1:

Map of Original Community Power Works Service Area



Attachment 2:

Community Power Works Service Delivery Partners and Roles

Seattle Community Power Works Service Delivery Role Matrix (X - primary/lead role x = supporting role)																				
WSU Energy Extension Program: Version 4.0 10-22-12		Governance				Role														
Partner		Steering Committee	Sustainability Team	High Road (SEIC)	Policy	Evaluation	DOE Reporting	Advisor	Service Coordination	Market ing	IT systems	Audit	Test -out/QA	Installation	Rebates/Gmts	Financing	Funds Mngmt	HRA Compliance	Workforce Development	
Service Delivery Partner (Contracted)																				
Service Delivery Partner (Sub-contract)	Primary Function																			
Authorizing agencies - Strategic and Policy Direction																				
US Department of Energy Better Building Program	Federal grant manager				X	x	X	x												
Seattle Mayor's Office/City Council	Authorizing body	X	X	x	X					x										
Seattle Office of Sustainability and Environment	Project manager / lead agency	X	X	X	x	X	X		X	X	X							X	x	
Cyan Strategies	Consultant program design and funding	X	x		x			X												
Milepost consulting	Sustainability plan facilitation		x					x												
Energy Market Innovations	Business Plan Development		x																	
Marketing / Outreach / Media (4)	CPW brand development, video, case study							x		x										
WSU - Energy Extension Program	CPW evaluation consultant	X	X	x	x	X	X	X			x							x		
National Renewable Energy Lab	National Better Building Evaluation		x					x												
Research in Action	National Better Building Evaluation							x		x										
Utilities																				
Seattle City Light	Partner - rebate - on bill payment	X	X		x	X		X	X	x		X	x		X					
Puget Sound Energy	Utility partner - rebates	X	X			x				x	x		x		X					
Seattle Steam	Partner - rebate - on bill payment	X															x			
Oil Distributors	Fuel supplier - stakeholder							x												
High Road Agreement - Workforce																				
Office of Sustainability and Environment	Lead agency			X	X	x	X				x							X	x	
Triangle Associates	HRA/SEIC facilitation			x				x												
Pacific Associates	Workforce Pipeline			x				x											X	
WSU Energy Program	HRA Compliance Tracking			x		X	X	x			x							X		
Emerald Cities	HRA development / compliance		x	x		x	x	X			x							x	x	
Puget Sound Sage	Community advocate HRA evaluation			x				x										x	x	
Qualified Training Programs (2+)	Qualified training provider			X				x											X	
Green for All	Community advocate			x				x											x	
Delta1NW (Lee Kuhl)	Business Development Support																		X	
Seattle OED - Workforce Development	Workforce development coordination																		x	
Home																				
Office of Sustainability and Environment	Project manager / lead agency	X	X	X	X		X		x	X	X	x			X		x	X	X	
Craft3	Standard and Low Income Loans	X	X		x		x	X	x	x	x					X	x			
PSCCU	Standard Loans / Funds Manager		X				x	X	x	x						X	X			
Cascadia Consulting	Home retrofit coordinator	X	X		X	x		X	X	X	X		x		X				x	
IT consultants (2)	Residential IT technical support										x									
Fluid Market Strategies	Contractor training / process design/ QA		X		x			x	x		x	x	X	x						
Habitat Audits	Auditor training / process design/QA							x	x			X	X	x					x	
Independent auditors	Test in assessments											X			x					
HRA Contractors (19+)	General Contractors			X				x	x	x	x	X	x	X	x	x		x	x	
Sub-contractors to HRA contractors (10+)	Residential services manager			X						x				X				x		
Earth Advantage	Energy audit / home rating software					x	x				x									
Energy Savvy	CPW Homes IT platform Manager		X			x	x	X	x		X									
Spatial Development other	Web development other services				x						x									
Clean Energy Works Oregon	Residential IT platform development lead		x					x			x									

Seattle Community Power Works – Fall 2012 Progress Report

Seattle Community Power Works Service Delivery Role Matrix (X - primary/lead role x = supporting role)																				
WSU Energy Extension Program: Version 4.0 10-22-12		Governance				Role														
Partner		Steering Committee	Sustainability Team	High Road (SELC)	Policy	Evaluation	DOE Reporting	Advisor	Service Coordination	Marketing	IT systems	Audit	Test -out/QA	Installation	Rebates/Grnts	Financing	Funds Mngmt	HRA	Compliance	Workforce Development
Service Delivery Partner (Contracted)	Primary Function																			
Service Delivery Partner (Sub-contract)																				
Low Income - Single Family																				
Seattle Office of Housing (Homewise)	Low income weatherization program	x	x			x	x		X			x								
Homewise Contractors (5+)	Residential contractor - Low Income												x	X						
Small Business																				
Office of Sustainability and Environment	Lead agency				X	x	x			x									X	
Cascadia Consulting	Small Business Retrofit Coordinator				X	x		x	X	X	X				X					x
Fluid Market Strategies	Quality Assurance/Assessments																			
Small Business Contractor (3 -overlap with Homes)	General Contractors									x		X	x	X	x					
PSCCU	Funds manager																x	X		
PECI	Technical consultant commercial											X								
Seattle Office of Economic Development	Economic development and financing				x			X	X	x							x			
National Development Council	Commercial project financing																x			
Large Commercial																				
Office of Sustainability and Environment	Sector Lead	X			X	x	X		x	x					X	x	x	X		
MacDonald Miller	Project development/Management	X	X			x	x	X	X	X	x	X	X	x	X	x	X	x		
Energy Efficiency Finance Corporation	Financial consultant							x												
Wells Fargo/Key Bank	Financing/funds manager																X	X		
Large commercial contractors (5+)	Design/Engineering/Elect/Mechanical											x	x	X						
Emerald Cities	High Road Compliance / Data						X	x			X							X	X	
McKinstry	Project development								x			X	X				x			
Seattle 2030 District	Long - term leadership/management		X		X			X	x	x										
Washington Department of Commerce	Oversight of EECBG Formula/ARRA							x									X			
Hospital																				
Office of Sustainability and Environment	Project manager / lead agency	X			X		X		X	X					X			x	X	
Solarec	Application Reviw												x		x					
Hospitals (4)	Project management (varies)							x	x			X		x						
Mckinstry	Engineering / Consult / Survey								x			x		x						
MacDonald Miller	Engineering / Consult / Survey	X							x	x		x		x						
Contractors (10+)	Design/Engineering/Elect/Mechanical											x		X						
Municipal																				
Office of Sustainability and Environment		X			X		X	x				x					x		x	
McKinstry	Municipal / hospital audits - ESCO							x				X	x	x						
City of Seattle Budget Office	Funds manager / financing manager				x			x									X	X		
Seattle Fleets and Facilities	Municipal projects developer/operator				x		x	X	X		x	x	X	x						
Seattle Parks and Recreation	Municipal projects developer/operator				x		x	X	X		x	x	X	x			x			
Contractors (multiple)	Installation				x		x	X	X			x	X	X			x			
Multi-Family																				
Office of Sustainability and Environment					x		X										X		x	
Seattle City Light/Puget Sound Energy					x			x									X		x	
Washington Department of Commerce					x	x												x		
Seattle Office of Housing (Homewise)		X	x		X	x	x	x	X		X	X	X		X		X		x	
Contractors (3-5 plus)														X						

Attachment 3:

September 2012 Community Power Works Upgrade Progress Report



Seattle Community Power Works Upgrade Progress Report

Current as of	9/30/2012			Upgrades in Progress				Upgrades Completed					Upgrade Results		
	Initially Screened (#)	Full Assessment Completed (#)	Qualified for Financing (#)	Upgrades Under Construction	Total Upgrade Investment (\$000)	CPW Incentives (\$000)	CPW Loans Approved (\$000)	Number Upgrades	Total Upgrade Investment (\$000)	CPW Incentives (\$000)	CPW Loans Made (\$000)	Average Energy Savings per Project (%/mBTU/yr)	Energy Savings (mBTU/yr)	Cost Savings (\$000/yr)	Tons Carbon (mT/yr)
Total	5,747	3,155	268	329	6,738	839	1,347	1,074	13,687	1,354	1,072		25,119	420	3,607
CPW for Homes ¹	2,962	2,132	237	210	3,030	531	1,347	362	3,769	751	1,072	28%	11,761	266	762
Low-income Homewise	NA	177	NA	51	313	13	NA	126	1,160	32	NA	30%	2,583	48	264
Small Business	927	118	0	7	59	28	0	6	121	53	0	15%	681	12	105
Large commercial	32	11	3	2	1,490	202	NA	1	891	72	NA	25%	Pending	Pending	956
Hospital ²	4	4	4	2	893	54	NA	3	4,797	261	NA	17%	7,036	NA	896
Multi-family ^{3,4}	1,653	681	NA	43	107	12	NA	565	2,373	186	NA	29%	3,058	56	401
Municipal ⁵	169	32	24	14	845	NA	NA	11	576	NA	NA	NA	Pending	38	223

¹ A single-family upgrade is counted as complete after the testout audit is performed.

² Hospitals are counted as fully assessed on approval of Strategic Energy Management Plans.

³ Initial data available 5/15. CPW "incentives" are installation cost share paid to the Seattle Office of Housing Homewise Program.

⁴ The number multifamily units upgraded. Reporting of energy and carbon savings for some completed projects is in progress.

⁵ The number of buildings initially screened uses data on total number of buildings from the City's most recent green house gas inventory. Number of completed projects - can have more than one project to a building.

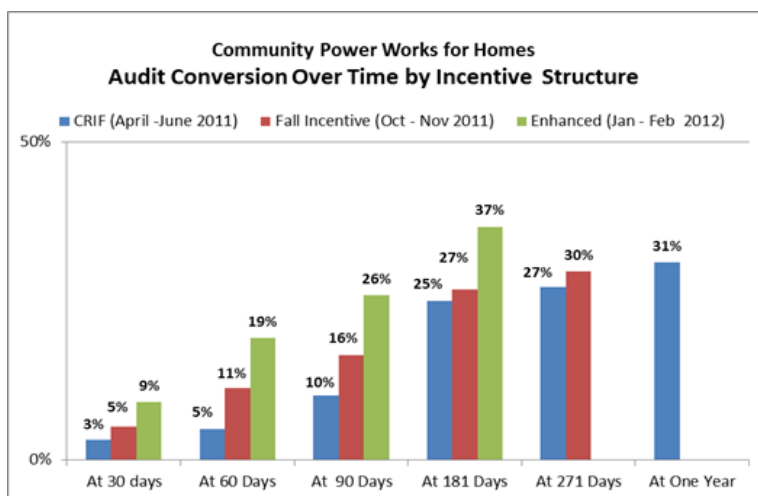
Attachment 4:

Seattle City Light / Community Power Works Assessment of Residential Audit Quality

October 22, 2012

Prepared by: Washington State University Energy Program
Vince Schueler
Emily Salzberg

One of the core goals of the Community Power Works for Home is to improving the quality of the services delivered and the skills of the workforce in the Home Performance industry. To do so, the Community Power Works for Home program partnered with Seattle City Light (SCL) to provide Energy Performance Score audit to all utility customers. Seattle City Light provided funding and led efforts to provide comprehensive assistance, training, and quality assurance to energy auditors to assure the technical quality of audits. Community Power Works provided supplemental training on using the audit tool for marketing and working with customers to close the deal.



As shown above, there has been a significant increase in audit conversion rates since the program began. Community Power Works for Home has made several changes to improve the efficiency of the program delivery systems and the attractiveness of incentives to homeowners. Although we cannot definitively link improvements in audit quality to increased conversions, we have definitively established that the quality of audits has improved significantly since the start of Seattle City Light and Community Power Works efforts, and therefore improved audits are likely to be contributing to improved conversion rates.

The Seattle City Light Home Energy Audit Program

The Community Power Works for Home program partnered with Seattle City Light, a municipal electric utility, to offer a single audit tool – the Earth Advantage Institutes' Energy Performance Score (EPS) – from start-up in April 2011 to present (see Attachment 1).

SCL has offered a subsidized EPS assessment to all Seattle City Light customers since 2010, regardless of heating fuel. Seattle City Light subsidizes \$305 of the \$400 cost of the audit and the homeowner pays \$95. As part of its commitment to assuring high quality audits, SCL provides extensive support to auditors including:

- Providing initial training on the Energy Performance Score audit tool to auditors participating in the Seattle City Light Home Energy Audit Program
- Requiring Building Performance Institute (BPI) certification for participating auditors
- Offering ongoing quality assurance technical assistance including and developing and communicating audit quality standards and expectations to auditors on a continuous basis.

Audit Services and the Community Power Works Program

An EPS audit is required to apply for Community Power Works incentives and financing. Under the Community Power Works for Home program, audit services are performed through one of more than 20 firms that provide energy assessment services (most are one- or two-person shops) or through in-house assessment staff at one of Community Power Works' full-service contractors. There was at least one person who provided assessment services at 13 of the 15 contractors in the pool as of August 2012.

Community Power Works has supplemented SCLs audit quality investments by:

- Including Building Performance Institute (BPI) certification requirements in program requirements and offering training stipends
- Offering additional training on using audit and assessment data as marketing tools to “close the deal,”
- holding monthly contractor meetings, providing technical support, mentorship, and networking opportunities for contractors and auditors.

All Community Power Works projects that receive a loan or incentives include a “free” \$200 test-out audit as a condition of payment. These audits are conducted by a single auditing firm and are not included in this analysis.

Assessment Approach

Washington State University (WSU) Energy Program home performance specialist staff compared audits for the first 50 projects completed in 2011 with audits for 50 projects completed in the summer of 2012. A single reviewer was used to eliminate issues related to inter-rater reliability.

WSU completed a comprehensive review of available documentation for each audit included in the sample. The documentation included:

- EPS data for EPS test-in and test-outs, including:
 - Audit inputs
 - EPS Scorecard
 - Energy Analysis Report
- Bid documents
- Community Power Works Internet technology (IT) Platform notes
- Quality assurance site visit reports

The WSU Energy Program analyst used a structured qualitative assessment tool that reviewed audits against three criteria and corresponding requirements:

- Was audit documentation complete and accurate?
 - Rated from 1= poorly documented to 5= well documented
 - Well documented audits consisted of clear and concise descriptions of the building components rated in the Home Energy Report Card, clear description of recommended upgrades in the Summary of Recommended Energy Upgrades report, and thorough photo documentation of building components with an accurate and clear description of current conditions and details of recommended upgrades.
 - Audits considered to be poorly documented did not include details on rated building components, did not include accurate summaries by building component, and/or did not include clear and accurate recommended upgrades.
- Was a clear list of priorities for investment provided?
 - (Yes/No) and 1= not clear and 5 = clear
 - Audits rated with Yes included a prioritized list that the auditor compiled in the auditor notes section of the Summary of Recommended Upgrades and included further description in the Recommended Upgrades Detail of the EPS report.
 - Audits considered as not having provided a clear list of priorities included no auditor assistance in prioritizing measures. The EPS auto-generated list of recommended measures was not considered to be a clear list of priorities for the purposes of this study.
- Were health and safety issues addressed by the auditor?
 - Rated as Yes/No/NA

- “Yes” ratings included health and safety issues that were discovered and documented by the auditor in the EPS report. For health and safety issues to be considered “addressed,” the auditor notified the homeowner of the situation by way of documentation in the EPS report and detailed a reasonable and industry-accepted approach to remediate the situation, including recommended follow-up and often a referral to additional services if services are not provided by the auditor.
- “No” ratings included health and safety issues that were documented in the audit and included no further information on how to address the situation or the implications of leaving the issue unaddressed.
- An “n/a” was indicated for audits where there were no health and safety issues in the home or the auditor did not document the issue in any way.

The assessment database includes the company name and the name of the auditor who completed the audit. Because of shifting business models and data-reporting issues, information on the auditor name is more reliable than the audit company and is used when making comparisons. Therefore, trends in improved audit quality are noted by individual auditor rather by the company as a whole.

The work of 31 auditors is represented in the sample. Of these, 15 auditors and 77 audits were included in both the 2011 and 2012 samples.

Assessment Findings

The Quality of Audits

The quality of audits has improved since program start-up. As illustrated in Tables A4-1 and A4-2, there is clear improvement in the quality of documentation and the clarity of recommendations. For auditors who did work in both years, the quality of their work improved year to year. The improvement in scores was even greater for auditors who were only in the 2011 or the 2012 samples. This suggests that some of the improvement may come from removing poorly performing auditors in 2011 and setting higher standards for new auditors who started work in this program in 2012.

Table A4-1. Quality of Documentation (1= not documented, 5 = well documented)

	2011			2012		
	N audits=	Average Rating	% Well Documented (4-5)	N=	Average Rating	% Well Documented (5)
All Audits	51	3.98	71%	51	4.25	87%
Auditor in 2011 and 2012	41	4.10	73%	36	4.28	86%
Auditor in 2011 or 2012	10	3.50	60%	15	4.20	87%

Table A4-2. Clear List of Priorities (1= not clear, 5 = very clear)

	2011			2012		
	N audits=	Average Rating	% Well Documented (4-5)	N=	Average Rating	% Well Documented (5)
All Audits	27	3.30	48%	51	4.1	73%
Auditor in 2011 and 2012	23	3.39	52%	36	4.28	78%
Auditor in 2011 or 2012	4	2.75	25%	15	3.67	60%

Of the 15 auditors who did audits in both years, 10 (67 percent) improved their documentation rating by an average of .6 points. And 9 of 11 auditors who were rated on their priority list increased their score by an average of .86 points.

Health and Safety

Health and safety issues include:

- The need for carbon monoxide detectors,
- The presence of asbestos,
- Issues with mechanical ventilation, and
- Problems with venting for combustion appliances.

The EPS assessment does not have a health and safety section in the EPS report. There is a place to input Combustion Appliance Zone test results in the assessment tool; however, this input does not have a corresponding output on the final report. Information on health and safety issues can be entered at the auditor's discretion under auditor notes at the end of recommendations. Because this is currently an optional input and output, the incidence of health and safety issues maybe under-reported.

Health and safety issues, as defined by the auditor, were identified in 13 of 51 (25 percent) 2011 audits and 16 of 51 (31 percent) 2012 audits.

If a health or safety situation was noted (or seemed likely as inferred from the audit) with no further details, instructions, or recommendations on how to remediate or who to contact, the health and safety issue was considered "not addressed." Health and safety issues were not addressed by the auditor in 1 of 13 (8 percent) of audits where they were relevant in 2011, and in 3 of 16 (19 percent) of the audits where they were relevant in 2012. Of the four cases, three of those issues that were not addressed involved the presence of asbestos or the suspected presence of asbestos, as noted below:

- 2677 – Vermiculite insulation in walls and attic. It appears that a blower door test was still done. Audit does not include details on whether defaults were used to estimate leakage or if a blower door test was completed but in pressurization mode.
- 3685 – Combustion air to combustion appliances. Based on details in the EPS merged report, it looks like there is a mechanical room with sealed combustion furnace and open combustion water heater. Auditor made recommendation to seal off combustion air openings (to the outside) to the mechanical room. Open combustion water heater, if in the mechanical room, still likely needs combustion air and is required by the mechanical code to have it.
- 3608 – Asbestos tape on ductwork. No information on safe remediation and/or who to contact to remove safely.
- 3699 – Asbestos tape on ductwork. No info on safe remediation and/or who to contact to remove safely.

Health and safety issues were also identified during the QA and/or test-out process. The issue most commonly found in third-party test-out was lack of a carbon monoxide detector when combustion appliances were present in the home. In some instances, a health and safety issue was identified in the test-out or QA process that was not identified by the audit. This reinforces the value added by the Community Power Works for Home program to the home performance industry and homeowners in Seattle. In the absence of third-party test-out and/or QA, these health and safety issues may have gone unaddressed.

Observations and Recommendations

Overall

- This analysis provides clear evidence that both the overall quality of audits has improved (the pool of auditors is higher quality) and the quality/skills of individual auditors has improved since the start of program.
- EPS estimates of utility cost savings are based on inaccurate rates and are likely to under- or over-predict cost savings. EPS-calculated cost savings are currently based on \$1.30 per therm – current costs are \$1.05 per therm – so savings are over-estimated by \$0.25 for each therm saved, or almost 20% overall for gas houses (per PSE current rate schedule). Fuel oil is significantly underpriced. This can be an important issue from a sales perspective when homeowners are reviewing their EPS report of recommended upgrades. This is not an issue the EPS user can adjust. This may affect the customer's view of the auditor quality.

Health and Safety

- One of the lead auditors for Community Power Works, Charlie Rodgers of Habitat Energy, noted that there is no health and safety section for the report and that “this should be at the beginning of the report and would encourage auditors to more fully document [health and safety] issues.”

- While only a small number health and safety issues were not addressed at the audit stage or captured during test-out, their presence indicates that further documentation may be of value to the Community Power Works for Home program. If combustion safety testing is completed, it may be wise to document results for each home via form completion that is stored on the IT portal.
- In the instances where asbestos abatement was recommended in the audit stage, it was considered “addressed” if recommendations on how to remediate the situation were provided to the homeowner. It was difficult to ascertain from available program documentation if the abatement work actually occurred prior to upgrade of the home. It may be wise to require proof of asbestos abatement in program documentation (the IT portal).

Other Issues

- Most audits studied as part of the assessment had a Custom Energy Analysis Report (CEAR) completed within EPS, either by the auditor or the program. Often, there are numerous CEARs located in the EPS platform and it is not always clear which one was officially used. Streamlining the naming convention for the auditors and program staff by requiring each audit to have one CEAR report titled Statement of Work (SOW) would reduce the confusion. Loading the official CEAR SOW onto the Community Power Works IT Platform would be an additional step to clarify work that was recommended or undertaken. If CEAR is the main tool that is used to calculate energy or carbon savings for incentives (as opposed to the EPS report), having the official CEAR SOW on the Community Power Works IT Platform would strengthen the quality and access to program documentation.

Attachment 5:

Community Power Works High-Road Dashboard – through 12 Q3

9/30/2012	Seattle CPW Home HRA Progress Report							
Goal	Metric	Total	Q3 2011	Q4 2011	Q1 2012	Q2 2012	Q3 2102	Notes
	Completed projects (homes) in last quarter	363	8	25	70	112	148	
	Average cost per project	\$10,492	\$11,110	\$10,067	\$7,342	\$10,617	\$11,925	
	Median cost per project	\$6,893	\$7,259	\$9,087	\$4,994	\$7,963		
	Average number of homes/contractor in pool	19.1	0.7	1.7	4.7	7.5	7.8	
	Average estimated annual kWh savings per home (net)	103.58	-838	1,316	34	212	-99	Includes fuel switching. Average for electric space heat 5504 kWh
	Average Therms saved per home	221	240	300	300	278	101	Includes some fuel switching. Average for Gas Space heat 315 Therms
	Average Gals saved per homes with Oil Heat	443	440	312	281	455	483	
	Average number of measures per home	3.47	4.5	3.7	3.8	3.6	3.2	
	Aggregate dollars saved per year by all CPW Home customers	\$270,961	\$6,585	\$14,149	\$33,700	\$70,934	\$145,593	
Goal A: Maintain sustainability and consistency of job and sector growth and investment	Total # of contractors in High Road Contractor pool	19	12	15	15	15	19	
	Total # of contractors performing work on projects completed in QTR	34	5	15	17	23	26	
	In High Road Agreement Contractor pool	19	5	11	12	14	16	Counted if working as prime or subcontractor
	Subcontractors to HRA Contractor pool	15	0	4	5	9	10	Must meet HRA standards
	Total cost of all projects completed to date (CPW + leveraged funds)	\$3,808,604	\$88,880	\$251,683	\$513,944	\$1,189,126	\$1,764,971	
	Wages on projects completed	\$449,413	\$20,546	\$70,579	\$103,929	\$254,359	\$205,197	Excludes benefits
	Total direct job-years generated in technical work to date	38.0	0.9	2.5	5.1	11.9	17.7	1 FTE = \$100,000 of work
	FTE/QTR ARRA Calculation Hours/520	48.1	1.6	5.0	8.2	18.1	15.3	
	Total # of employees participating to date	202	16	49	69	121	112	Employees working on at least one completed project in the quarter whether as a contractor or subcontractor. Hours worked by current HRA pool contractors as Sub-contractors prior to full certification are counted
	In High Road Agreement Contractor Pool	168	16	41	63	102	95	
	Subcontractors to HRA Contractor pool	34	0	8	5	19	17	
	Total New Hires Reported in Quarter	95	25	19	15	29	9	Returning workers and entry level with a hire date in the quarter. Includes workers who worked for multiple contractors -Row 46 is a better count
	Percentage of business related to CPW				~75%	10-85%		5-35% of Gross Receipts from CPW
	Percentage growth outside of CPW							Not available
Percentage of revenues from non-public sources				NYA	5- 85%		Twelve of fifteen contractors reported more than half their projects had city, state or federal funds involved	
Goal B: Keep the program simple and predictable, especially for Contractors	Indicators from contractor surveys/feedback		Contractor Interviews indicate that CPW is considered better than either Low Income or Utility Programs. There have been significant efforts to simplify the program which are appreciated. The pace of change has been a challenge.					
	Is paperwork/data reported on time?		All current contractors are meeting workforce reporting requirements. A survey of 12 of 15 contractors found that HRA workforce reporting requirements were manageable. The current reporting application is considered a major improvement. The new application tightly links workforce reporting to the invoice process. Delays in the invoicing process does cause delays in workforce reporting					
	Number of contractors out of compliance with HRA		Defined as being substantial breach of one or more requirements					
	Number of contractors leaving contractor pool		4	2	0	2	0	0

	Survey in process
	Verifying data
	Key metrics

Seattle Community Power Works – Fall 2012 Progress Report

9/30/2012	Seattle CPW Home HRA Progress Report							
Goal	Metric	Total	Q3 2011	Q4 2011	Q1 2012	Q2 2012	Q3 2102	Notes
Goal E: Ensure Contractors do high quality work	Number of contractor call backs							Available next report
	Average number of BPI certified employees per contractor					1.9		
	Average % of BPI certified employees per contractor					28%		Median is 20%
Goal F: Ensure that program jobs lead to career pathways	% of workers in State registered apprenticeship programs	4%	0%	10%	1%	2%	4%	Based on cumulative hours from start for projects completed through the end of June. Only 4 of 155 workers had more than 450 total hours. None had more than 900 hours.
	% of targeted workers performing 450 hours or more	8%	0%	0%	0%	1%	8%	
	% of targeted workers performing 900 hours or more	0%	0%	0%	0%	0%	0%	
	% of targeted workers performing 1800 hours or more	0%	0%	0%	0%	0%	0%	
	% of graduates of QTP performing 450 hours or more	0%	0%	0%	8%	5%	9%	
	% of graduates of QTP performing 900 hours or more	0%	0%	0%	0%	0%	0%	
	% of graduates of QTP performing 1800 hours or more	0%	0%	0%	0%	0%	0%	
	Average number of classroom hours per employee							Not tracked
	Number of workers leaving contractors to other construction work	About 20% of severed employees are moving on to other opportunities based on contractor interviews						
Goal G: Ensure that program jobs pay a family-supporting wage	Percentage of project with wages reported	336	8	25	70	112	121	
	Percentage of project with wages reported		100%	100%	100%	100%	82%	
	Wage compliance by percentage of hours reported		100%	100%	100%	99.6%	99.7%	
	Number of employees paid complying wages		16	49	69	119	111	Most or all contractors are compliant. 196 of 202 (97%) of workers were complying wages. There are not enough non-compliant cases to identify any patterns of non-compliance
	Entry-Level Wage		4	4	9	10	11	
	Base Wage		7	33	45	66	62	
	Specialty Wage		5	12	15	43	38	
	Number contractors complying with wages standard		5	15	17	20	23	Based on projects completed in the quarter. Most wage compliance issues were one time events or for subcontractors who worked on a single job.
	In High Road Agreement Contractor pool		5	11	12	13	14	
	Subcontractors to HRA Contractor pool		0	4	5	7	9	
	Average hourly construction wage on projects	\$ 25.04	\$ 25.16	\$ 28.48	\$ 24.92	\$ 26.67	\$ 27.13	
	Median hourly construction wage on projects	\$ 25.00	\$ 24.00	\$ 25.00	\$ 24.00	\$25.00	\$25.00	
	% Workers receiving employer-paid health insurance	56%	0%	48%	53%	62%	52%	Working on projects completed in the quarter. Self-reported
	In High Road Agreement Contractor pool	54%	0%	40%	54%	54%	49%	
	Subcontractors to HRA Contractor pool	64%	0%	0%	14%	79%	65%	
	% Contractors offering health insurance:		42%	43%	53%	60%	63%	
	Health insurance just for worker		5	6	8	9	12	Contractors in the pool regardless of work done
	Health insurance for dependents		4	4	4	4	6	
	% Contractors providing other benefits (to all workers)		42%	43%	20%	20%	26%	
	Retirement		1	1	1	1	1	
	Vision		5	6	3	3	5	
	Dental		5	6	3	3	4	

	Survey in process
	Verifying data
	Key metrics

Seattle Community Power Works – Fall 2012 Progress Report

9/30/2012	Seattle CPW Home HRA Progress Report							
Goal	Metric	Total	Q3 2011	Q4 2011	Q1 2012	Q2 2012	Q3 2102	Notes
Goal C: Maintain balance between job creation and existing workforce - 33% of techinal work hours performed by targeted workers	Total Number of Workers (baseline)		116	147	143	143	213	
	Total number of targeted workers in contractor applications (baseline)		54	54	55	55	61	
	Total number of graduates of QTPs in contractor applications (baseline)		3	1	1	1	4	
	Total number of targeted workers working on CPW homes	75	7	21	30	45	44	Projects completed in Quarter 12Q3 is preliminary likely 45-50
	Total number of graduates of QTPs working on CPW homes	28	4	9	11	18	19	Includes all QTP graduates regardless of whether they were hired since 4/1/11. Six QTP graduates had under 24 hours in only one quarter
	Total technical hours on all projects last quarter	25,030	817	2,581	4,280	9,420	7,932	Some reporting lag -- see row 87
	Average technical hours per project last quarter	74	102	103	61	84	66	
	Total technical hours performed by targeted workers	10,498	311	1,089	2,167	3,643	3,288	Some workers are both QTPs and targeted workers. . Based on hours reported for projects completed in that quarter
	% Total technical hours performed by targeted workers	42%	38%	42%	51%	39%	41%	
	Total techinal hours performed by graduates of QTPs	3,700	247	712	1,010	1,731	2,029	
	% Total technical hours performed by graduates of QTPs	15%	30%	28%	24%	18%	26%	
	Total new hires working on CPW projects	84	8	20	28	48	49	Hired since April 2011
	Total new entry-level hires since 4/1/11 - self report	33	3	7	12	18	21	Working on projects completed in the quarter
	Total technical hours performed by new entry-level hires	2993	170	382	854	1,509	1,653	
	% Total technical hours performed by new entry- level hires	12%	21%	15%	20%	16%	21%	
	# of companies reaching 33% Hours performed by targeted workers	9	4	6	7	6	7	
	% of companies reaching 33% (High Road Agreement Contractor Pool	47%	80%	56%	54%	43%	44%	
% of companies reaching 33% (High Road Agreement Contractor Pool Sub)	29%	80%	40%	41%	26%	29%	Includes sub-contractors	
Goal D: Business participation rates: * 80-100% small business participation * 30% minority owned * 10% women owned * 100% local * increased opportunity for employee-owned and verteran-owned	Number of businesses qualifying in pool as :							
	Local		12	14	14	14	18	
	Small		12	15	15	15	19	
	Minority owned		1	2	3	3	3	
	Woman owned		1	3	1	1	2	
	Veteran owned		3	3	3	3	4	
	Employee owned or non-profit		1	1	1	1	1	
	Total upgrade dollars for businesses qualifying as:							
	Local	\$2,033,353	\$88,880	\$251,683	\$490,315	\$1,202,475	\$1,689,408	
	Small	\$2,033,353	\$88,880	\$251,683	\$490,315	\$1,202,475	\$1,741,923	
	Minority owned	\$10,335	\$ -	\$0	\$ 3,635	\$ 6,700	\$ 138,282	Based on total price and status of prime contractor -- includes work done by sub-contractors. Sub-contractors with status not included.
	Woman owned	\$86,280	\$ -	\$19,836	\$ 31,582	\$ 34,862	\$ 112,088	
	Veteran owned	\$282,483	\$ -	\$28,018	\$ 77,697	\$ 176,768	\$ 305,794	
	Employee owned or non-profit	\$297,326	\$ -	\$76,198	\$ 19,537	\$ 201,591	\$ 144,994	

	Survey in process
	Verifying data
	Key metrics

Attachment 6:

Community Power Works for Home, Summary of Technical Worker Characteristics, April 2011 – June 2012

As part of the City of Seattle’s commitment to the High Roads Agreement, the City is tracking technical labor hours for all completed projects.²⁷ Data on race, ethnicity and gender is captured by worker. This report summarizes data for 234 projects that have reported technical labor hours between April 2011 and June 2012.

Technical labor hours were reported for 154 workers over this period. Fifty-one workers (33%) accounted for 83% of the total labor hours, as shown in Figure A6-1.

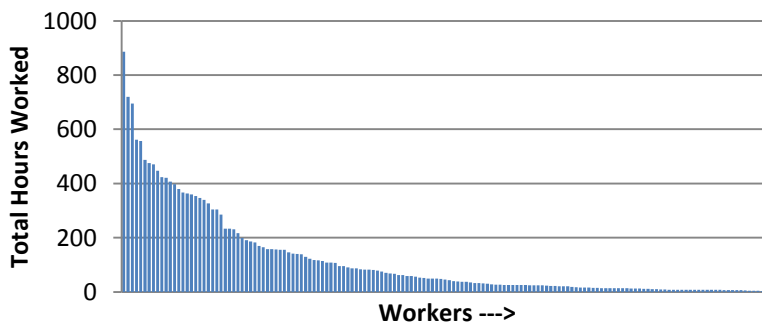


Figure A6-1. Distribution of Total Hours by Technical Worker

Technical Work Classifications

Workers were classified in one of seven job descriptions. A worker can work in more than one job classification. Eighteen (12%) of workers had technical hours reported in more than one classification. Two-thirds of reported hours were for weatherization workers (see Table A6-1).

Community High-Road Agreement contractors performed 92% of the work hours reported. A total of 80% of the non-HRA reported hours were for HVAC work, with the remaining hours split between electricians and window and door classifications. A total of 86% (132 of 154) workers reporting hours were employed by HRA contractors.

The average wage excluding fringe benefits was the lowest for weatherization workers, in part because they are more likely to be new entry-level workers.

²⁷ Technical labor is defined as work done on site to complete an energy efficiency upgrade. It excludes sales and back-office support roles.

Table A6-1. Reported Hours and Wages by Technical Worker Classification

Job Description	Total Hours Reported	HRA Contractor Hours (%)	Average Reported Wage
Crew Chief	1,390 (7.7%)	1,390 (8.4%)	\$31.27
Electrician	1,306 (7.3%)	1,166 (7.0%)	\$31.98
Heating, Ventilation and Cooling (HVAC)	1,444 (8.0%)	300 (1.8%)	\$38.59
Plumbing	128 (0.7%)	128 (0.8%)	\$38.13
Carpenter	1,313 (7.3%)	1,313 (7.9%)	\$24.25
Window and Door	673 (3.7%)	535 (3.2%)	\$27.91
Weatherization	11,751 (65.3%)	11,751 (71.1%)	\$23.30

Entry-Level Workers

A major goal of the Community High-Roads Agreement was to encourage hiring and career paths for new-entry hires. Of the 132 employees reported by HRA contractors:

- 79 (60%) were on staff as of April 2011,
- 29 (22%) were experienced workers who were rehired after being without work, and
- 24 (18%) were new entry-level hires.

New entry-level hires performed 20% of the reported hours. Returning, experienced workers performed 32% of reported hours.

There were no new entry-level hires in plumbing, HVAC, and windows and doors job classes. There were significant numbers of entry-level hires in the weatherization worker (28%) and carpenter (24%) classifications, and few new-entry hires among crew chiefs (10%) and electricians (5%). Entry-level workers performed a smaller share of technical hours and were mostly (95%) in the weatherization worker category.

Most of the expansion or maintenance of capacity is being met by returning, experienced hires, as illustrated in Figure A6-2.



Figure A6-2. Worker Hire Status by Job Classification

Race and Ethnicity of Workers by Job Description

Two out of five (41%) of all workers reporting hours were non-white or Hispanic. Non-white and Hispanic workers have the largest share of the weatherization and window/door worker job classifications, as illustrated in Figure A6-3.

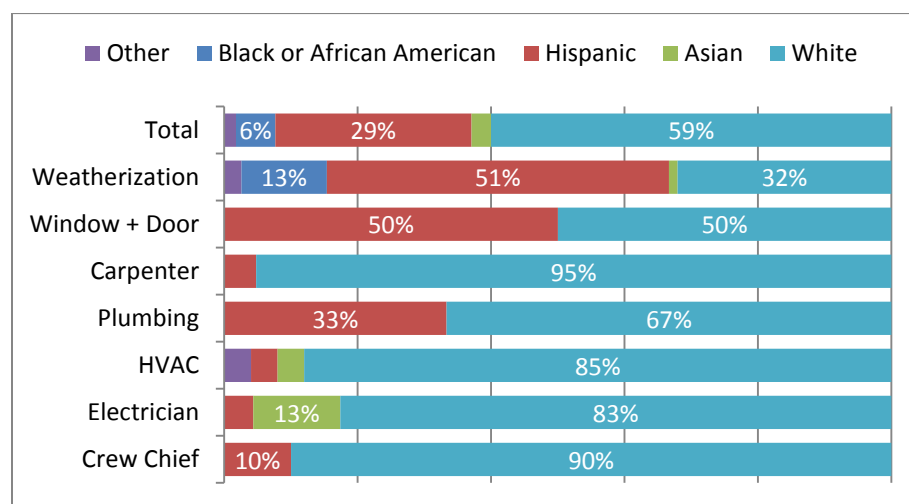


Figure A6-3. Total Workers by Job Description and Race and Ethnicity

Almost half (48%) of technical labor hours for Community Power Works for Home upgrades were performed by non-white or Hispanic workers. Figure A6-3 shows that most of this work was performed by weatherization and window and door workers. Over 90% of hours in the other classifications were performed by white, non-Hispanic workers, as illustrated in Figure A6-4.

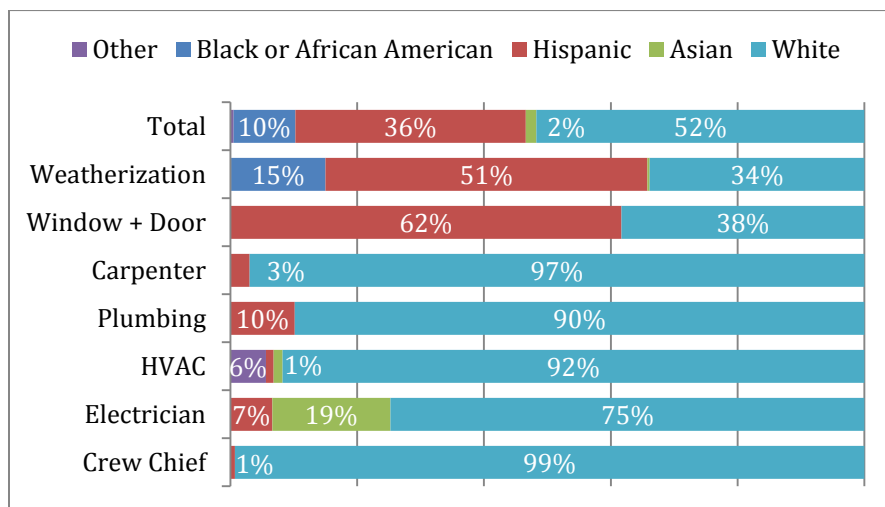


Figure A6-4. Total Technical Hours by Job Description and Race and Ethnicity

Figure A6-5 shows the distribution of race and ethnicity when we exclude technical hours for window/doors, HVAC and electrical work is sub-contracted to contractors who are not participating in the HRA.

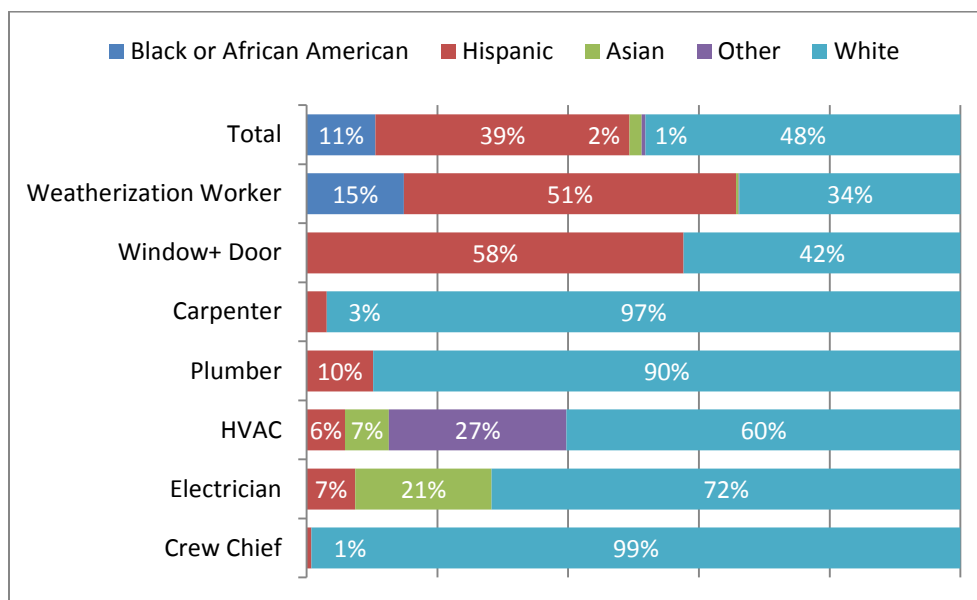


Figure A6-5. Total Technical Hours for HRA Contractors by Job Description and Race and Ethnicity

Only two of 154 workers (1%) were female. Female workers accounted for less than 1% of technical hours.

