Office of the City Manager

March 11, 2014

To: Honorable Mayor and Members of the City Council

From: Christine Daniel, City Manager

Subject: Evaluation of Federal Stimulus Residential Upgrade Program

The City has completed an evaluation of the ME2 Residential Energy Upgrade program, which was funded by the Federal Stimulus. The study is based on a set of 99 of the 142 single family homes that participated in the American Reinvestment and Recovery Act (ARRA) and PG&E ratepayer-funded Berkeley Money for Energy Efficiency (ME2) program between 2010 and 2012. The analysis of actual energy consumption from participating homes before and after the program shows that major energy improvement projects provide benefits to the community and homeowners that exceed the costs.

Please contact Neal De Snoo at ext. 7439 if you have any questions regarding this study.

Attachment

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City of Berkeley
Money for Energy Efficiency (ME2) Outcomes Evaluation

March 2014

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Acknowledgements

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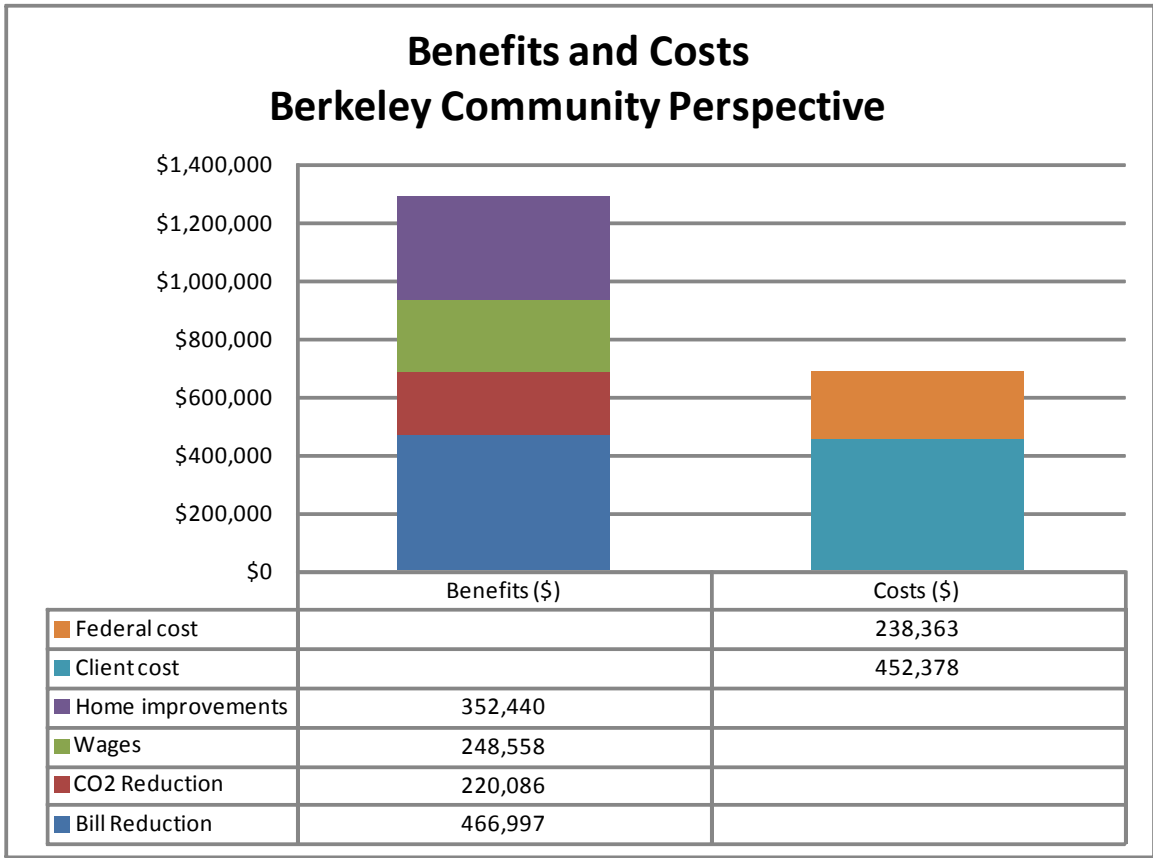
Summary

The City of Berkeley provided incentive funding for Berkeley homeowners to complete major energy upgrades through a program called Money for Energy Efficiency (ME2). An analysis of actual energy consumption from participating homes before and after the program shows that major energy improvement projects provide benefits to the community and homeowners that exceed the costs. The study is based on a set of 99 single family homes that participated in the American Reinvestment and Recovery Act (ARRA) and PG&E ratepayer-funded Berkeley Money for Energy Efficiency (ME2) program between 2010 and 2012.

The average reduction in energy consumption for the 99 ME2 properties is 18%. Other significant benefits to the community include leveraging ratepayer subsidies, reducing greenhouse gas emissions, providing wages for local/regional labor, and providing non-energy client benefits, such as comfort and home improvement.

A comparison between the benefits and costs from the Berkeley community perspective are presented in Figure 1 below. It is important to note that in this perspective, the ARRA costs have been assigned to the community in order to represent current conditions now that the Federal Stimulus has expired. The benefit-to-cost ratio for the actual program, where Federal taxpayers supported the community, would be significantly higher than the results presented below.



	Benefits ($)	Costs ($)
Federal cost		238,363
Client cost		452,378
Home improvements	352,440	
Wages	248,558	
CO2 Reduction	220,086	
Bill Reduction	466,997	

Figure 1: Benefits exceed costs by nearly two to one, even without Federal subsidies. The figures are the average of the high and low scenarios.

The analysis considers several perspectives:

- Actual participants
- Hypothetical participants without the ARRA subsidy
- PG&E ratepayers and Federal taxpayers
- PG&E ratepayers only
- Society at large
- The Berkeley community

Benefits vary by perspective and include:

- Energy bill savings, based on weather-adjusted actual changes in energy consumption and projected rate increases (in 2012dollars)
- Carbon dioxide emissions reductions, based on values provided by consultants to the CA Public Utilities Commission (CPUC)
- Wages paid by local private contractors
- Other non-energy client benefits (e.g., comfort, home improvement, etc.), based on a willingness-to-pay survey of program participants

Costs vary by perspective and include:

- Client costs, net of all rebates
- PG&E rebates
- Federal stimulus rebates

The study reveals four main policy considerations. First, it is in the community's interest to maximize participation in ratepayer-subsidized home energy improvement programs.

Second, current data access practices are unnecessarily restrictive and are a major obstacle to best practices in program evaluation and design. Better access to data would help local policymakers consider policies and allocate resources that could directly support the State's energy goals. As it is now, local policymakers are uninformed, but nevertheless accountable for energy reductions pursuant to State-mandated local climate action plans.

Third, the analysis calls into question the current regulatory practice of applying the total resources cost (TRC) test as a measure of program cost-effectiveness in situations where non-energy client benefits are a major driver for investments in energy efficiency.

Finally, the benefits need to be more transparent so that homeowners are willing to make investments.

Background

The City of Berkeley offered financial incentives with Federal Energy Efficiency and Conservation Block Grant (EECBG) funds made available through the American Recovery and Reinvestment Act (ARRA) to owners of residential, commercial and industrial properties t to conduct energy audits and make energy efficiency improvements. The program was launched in conjunction with PG&E's pilot Whole Home Upgrade program. This analysis focuses on the results from the residential single-family homes sector.

A total of 196 homes were audited and 142 received improvements. Of these, valid pre- and post-improvement energy billing data are available for 99 homes. The improvements were completed between September 2010 and July 2012. Scopes included the following: air sealing; insulation; duct repair, insulation and replacement; water heater and space heating equipment replacement; window replacement; and various other measures (e.g. vapor barriers, lighting).

Measure Frequency	Homes	Percent
Air Sealing	99	100%
Insulation	95	96%
Duct Repair/Replacment/Insulation	62	63%
Furnace/Boiler Replacement	21	21%
Solar Hot Water	8	8%
Window Repalcement	6	6%
Water Heater Replacement	1	1%

Table 1: Improvements to the building shell were the most common measures

The program was deployed using two models 1) a rebate paid after a private contractor project and 2) a direct install workforce development program where incentives were deducted from the invoice prior to client payment. The direct install program did not include mechanical equipment and windows. All projects included baseline and post-project energy simulations based on Building Performance Institute (BPI) protocols. Improvement incentives were based on modeled energy improvements. A minimum 15% modeled improvement was required for the private contractor rebate program and a 5% minimum was required for the direct install program incentive.

The CPUC is conducting an evaluation of the comparable Energy Upgrade California (EUC) program. That EUC evaluation does not include any projects with ARRA subsidies, like the ME2 program. This ME2 program evaluation may still be of value to the CPUC since the presence of the ARRA rebates only affects the uptake of the program and the depth of the scope. The benefits that accrue relative to a given investment are not impacted by the ARRA subsidies and can be applied to other situations.

Approach

The benefit-to-cost (BCR) ratio for each perspective is determined by dividing the sum of the benefits by the sum of the costs. The term of the analysis is 30 years. Dollars are expressed in 2012 values or the closest available proxies. High and low scenarios are provided for each perspective.

Perspectives

Table 2 below describes which benefits and costs are included in each scenario. Of particular interest is the Berkeley Community perspective, which can be applied to prospective future projects since it assumes the Federal subsidies are not available and are part of the cost to the community. Note, these perspectives do not always align with the perspectives considered by the California Public Utilities Commission (CPUC), such as the Total Resources Test and the Utility Cost Test. In some cases, this is due to technical issues, such as the difficulty in assigning values for avoided utility costs. In other cases, such as for the Total Resources Test, it is because such perspectives are irrelevant.

Benefits and Costs Considered in Each Perspective							
Perspective	Benefits				Costs		
	Bill Reduction	CO2 Reduction	Wages	Home Improvements	Client	Rate-payer	ARRA
Actual Participants	YES	no	no	YES	YES	no	no
Participants without ARRA	YES	no	no	YES	YES	no	YES
Ratepayer & Taxpayer	no	YES	YES	no	no	YES	YES
Ratepayer	no	YES	no	no	no	YES	no
Society	YES	YES	YES	YES	YES	YES	YES
Berkeley Community	YES	YES	YES	YES	YES	no	YES

Table 2: Benefits and costs vary by perspective

Actual Participant. This represents the perspective of the clients that are part of this study. The benefits are limited to client energy cost savings and home improvements. The costs are the net costs to the client after ratepayer and ARRA rebates.

Participants without ARRA. This case approximates what a client might experience by participating in the program now, when ARRA subsidies are no longer available. It assumes the ARRA rebates are part of the client costs. As of November 2013, PG&E reports that there are 99 clients in Berkeley who have completed a home energy upgrade without the ARRA subsidy. Because they were not part of the City's ME2 program, the City does not know who they are and has no client specific data that could be used to inform this or any future evaluations.

Ratepayer and Taxpayer. This case compares the public benefits and costs of the program. Benefits include carbon reductions and wages. Costs include all rebates.

Ratepayer. This case most closely corresponds to the CPUC's Utility Cost Test and Ratepayer Impact Measure in that it uses the cost of carbon as a benefit, as opposed to the avoided cost of supply, which is not available for this study.

Society at Large. This case includes all benefits and all costs.

Berkeley Community. This approximates the benefits to the community if the projects were deployed without any Federal subsidy, and as such, represents what the value of such improvements might be going forward. Benefits include client bill reduction, CO2 reduction, wages, and home improvements. Costs include client costs and ARRA rebates.

Notably, the analysis does not include a Total Resources Test (TRC), the yardstick for evaluating ratepayer-funded programs in California. The TRC compares utility resource savings (i.e., avoided cost of procurement and other costs of service) to costs incurred by clients and ratepayers. This perspective is not included because it assigns no value to non-energy client benefits and as such overstates program costs.

Benefits

Bill Reduction

The City acquired billing data for 107 clients who consented to disclose information to the City. The data were directly uploaded from PG&E into EPA's Portfolio Manager, and then downloaded by the City. Data include read dates, monthly energy consumption and monthly costs for electricity and natural gas.

The data for each participant were parsed before and after project completion (with a three-month deadband for the duration of the project). Data were annualized and adjusted for weather variations. Of the 107, homes, 99 have at least 12 months of pre- and post-project data. These 99 comprise the data set used for the analysis. On average, data sets include 29 months of pre-project data and 21 months of post-project data.

Marginal natural gas and electricity rates are applied to the energy reductions. The marginal rate is based on the weighted average rate of the data set according to PG&E's tiers based on 2012 tariffs.

Consumer discount rates are applied to participant perspectives; societal discount rates are applied to all other perspectives.

See the Economic Assumptions section below for assumptions used for the projected savings streams.

It should be noted that the bill reductions that accrue to the participant, societal and community perspectives are probably understated given that the cost of carbon emissions, which will likely become embedded in utility rates, are not included.

CO2 Reductions

The ranges of the cost of carbon are based on CPUC consultant E3's proposed values, as presented in a *CPUC Workshop on Societal Cost Test*, June 2013. The values are incremental to the expected cost of compliance with cap and trade regulations that will be embedded in future rates. Values include the costs of damages caused by climate change. According to E3, "[a]ll of the current carbon costs are meant to reflect near-term expected cost outlays for compliance or mitigation" and therefore, these values are not discounted. The coefficients used are the standard natural gas coefficient used by PG&E and the certified 2011 coefficient for PG&E electric emissions.

Wages

As part of the project contractors reported their total hours labor hours . Direct wages were calculated by multiplying the average number of labor hours per $1,000 of gross cost by the average labor rate. The rates are based on data from the major contractors that participated in the program. Labor hours and rates for the direct install training program are not used because the hours spent on the job and the wages paid are not reflective of typical contractor practices.

Other Non-Energy Client Benefits, i.e., Home Improvement

Although difficult to quantify, this set of benefits is nevertheless real and must be considered under certain perspectives. Such benefits include comfort, indoor air quality, reduced mold, reduced noise, deferred capital expenses, reduced maintenance expenses and the associated roll-up of these into higher equity upon sale.

In order to quantify these benefits, the City conducted a willingness-to-pay (WTP) survey of participants in January 2014, well after project completion. Participants were asked the following question: "Could you estimate the monetary value for the non-energy related benefits you received from your energy upgrade project? Please provide a specific dollar value that represents what you would have been willing to pay for these benefits. Do not include any benefits associated with reduced energy bills, the environment at large or employment of the crews who performed the work." A total of 19 participants responded. Each response was divided by the gross cost of each responder's project. The average WTP is 86% of gross project costs; the median is 43%. These are surprisingly high values, which exceed the net client costs by as much as 75%.

Other data support a high value. A City of Seattle study estimates the annual non-energy client benefits as a percentage of energy savings to be 60% for weatherization, 110% for windows and 120% for HVAC improvements.[1] Expressed in the same terms as the Seattle study, the median Berkeley WTP non-energy client benefits range from 92% to 145% of client energy savings (the average WTP results are as high as 290%of energy savings).

Another point of reference is a qualitative survey of ME2 clients in which respondents were asked what motivated them to participate in the program. Availability of rebates was cited by 85% of the respondents, followed by improving the comfort of their homes (81%) and reducing energy bills (76%).

Based on these data, it appears that the non-energy client benefits greater than the energy savings. The analysis conservatively assumes that the non-energy client benefits are equal to the energy savings, discounted to 2012 dollars.

Benefits not Included

Indirect employment benefits are not included but may be significant.

The avoided cost of utility generation and capacity is not included. Although this is usually included in utility cost tests, it is omitted because electricity savings are a small component in this program and data on electricity savings are not available by time of day, an essential part of the avoided cost calculation.

[1] www.seattle.gov/light/conserve/reports/paper_6.pdf

Costs

The client costs consist of the actual invoiced costs less all rebates. Ratepayer rebates are calculated using the PG&E formula that applied to the pilot. ARRA rebates are the actual ARRA subsidy that was paid to the client (or in the case of the direct install training program, deducted from the client invoice). The cost of developing and administering the pilot are not included.

Economic Assumptions

Period

The energy savings stream assumes a measure lifetime of 30 years. All measures were installed as fixed parts of the homes and the majority were installed as part of the building envelopes (e.g., air sealing, insulation). Only 23% of the projects included replacement of furnaces or domestic hot water systems. All other measures, with the exception of a few lighting measures, are part of the building envelopes.

Energy Cost Escalation Rates

The analysis assumes a 2.2% annual electricity and natural gas rate increase. According to the Congressional Budget Office's *The Budget and Economic Outlook: Fiscal Years 2013 to 2023* report[2], the consumer price index is projected to increase by 2.2 to 2.3% annually between 2015 and 2023.

Discount Rates

Societal discount rates are based on CPUC consultant E3's proposed values in CPUC Workshop on Societal Cost Test, June 2013[3]. Consumer discount rates are assumed to be double the societal rates.

Net-to-Gross

Typical benefit-to-cost analysis dismisses a certain percentage of benefits on the assumption that some of the participants would have made the investment even without subsidies. This term for this factor is the net-to-gross (NTG) ratio. However, in the case of whole home performance there did not appear to be very much market activity before the incentive programs were established so free ridership is probably very small. No NTG is applied in this analysis.

Results

Energy Savings

On average, the group experienced an 18% reduction in total energy consumption. The majority of the savings are from natural gas, at 22%; electricity savings average 4%. Actual savings were lower than modeled, as were actual baselines. Modeled baseline natural gas consumption was more then twice

[2] http://www.cbo.gov/sites/default/files/cbofiles/attachments/43907-BudgetOutlook.pdf

[3] SCC Approach 2: Avoided Electricity, Decarbonization Cost Approach, CPUC Workshop on Societal Cost Test, E3, June 2013

actual consumption and was over-estimated for all but one home. Electricity consumption was also over-estimated but not to the same extent.

Energy and Carbon Savings	Pre	Post	Reduction (units)	Reduction (%)
Modeled				
Therms	103,117	67,273	35,843	35%
kWh	612,901	567,325	45,576	7%
MMBtus	12,403	8,663	3,740	30%
Actual				
Therms	48,968	38,427	10,540	22%
kWh	390,820	375,064	15,756	4%
MMBtus	6,230	5,122	1,108	18%
CO2 (metric tons)				
Natural Gas	260	204	56	22%
Electricity	70	67	3	4%
Total	329	271	59	18%

Table 3: Most of the savings come from natural gas reductions

As illustrated in the scatter plot chart below, individual results vary significantly, with 12 homes consuming more energy after improvements and a few homes consuming far less energy. The reasons for this are unknown but may include a change in use or occupancy and increased utilization of space heating equipment. For example, ne client reported that the project replaced her wall heater with a central furnace. She suspects that the furnace was oversized for her small Berkeley home and although she is now able to heat her entire home more quickly, the result is increased consumption. This problem may be due to improper project scoping and/or lack of appropriately-sized equipment for smaller loads.

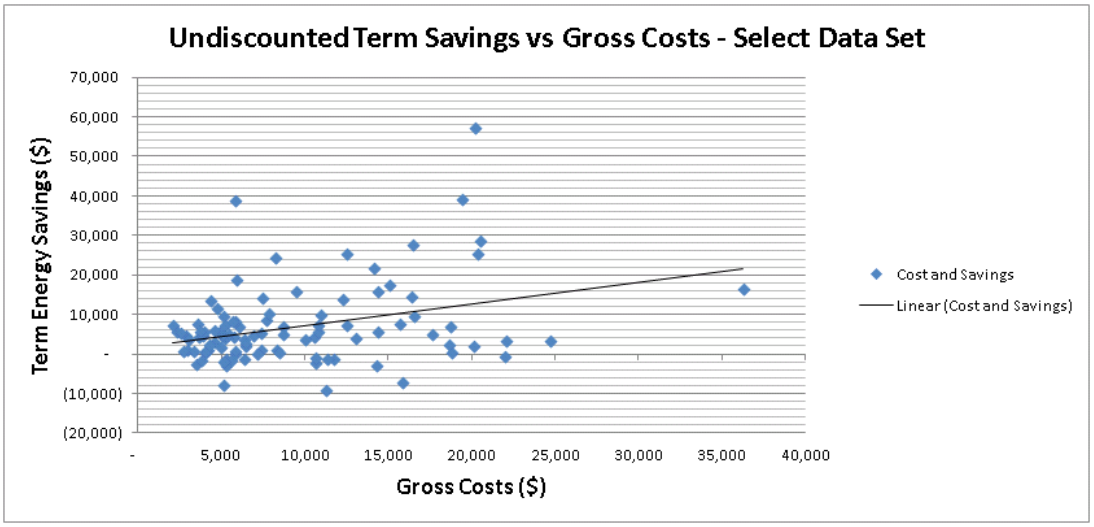


Figure 2: Results vary widely

Savings as a percentage of baseline usage expressed as millions of Btus (MMBtus) are more consistent, as shown in the scatter plot chart, Figure 3, below.

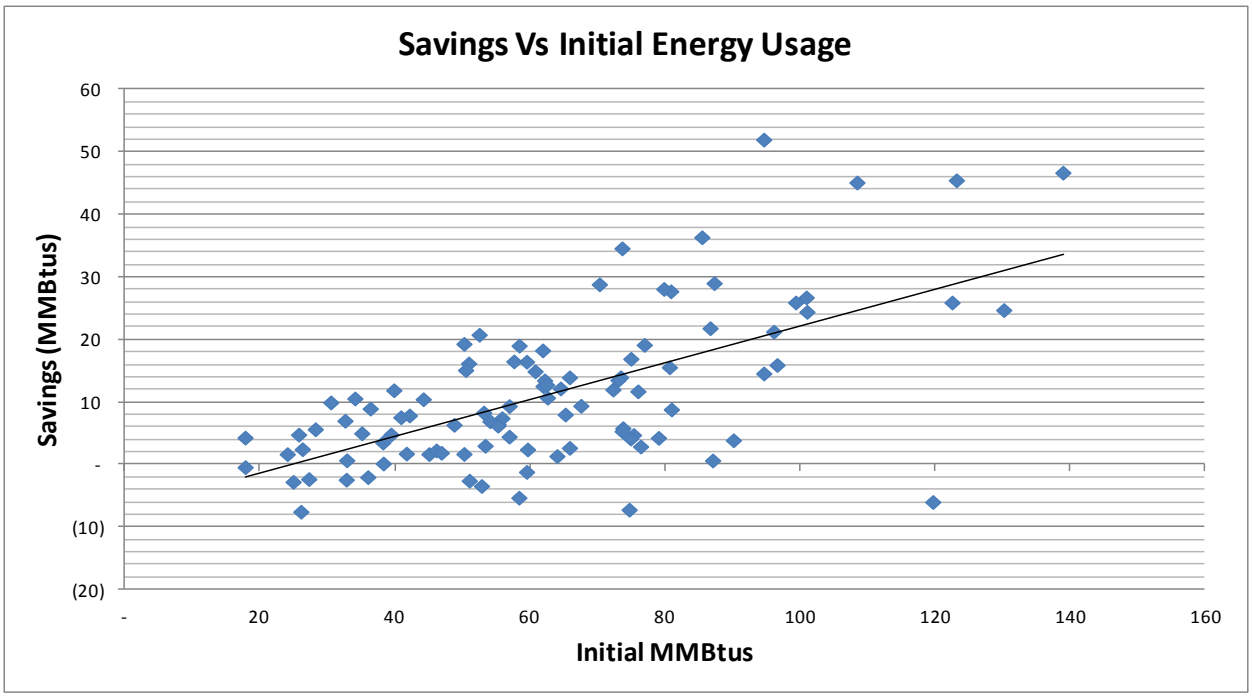


Figure 3: Savings generally correspond to baseline consumption

Benefit and Cost Comparisons

The benefit-to-cost analysis indicates that the benefits to the community and homeowners exceed the costs in most scenarios, and are quite high for the Berkeley Community scenarios in particular. The findings for community benefits hold true even if Federal subsides are not available.

In the Berkeley Community scenarios, it is assumed that the Federal subsidies are not available and are instead part of the local cost. This represents current conditions. The community benefits by leveraging ratepayers' funds (which the community pays regardless of whether or not it participates in the programs), reduced utility bills, wages paid to local or regional workers, home improvements, and carbon dioxide reductions -- a stated community policy objective.

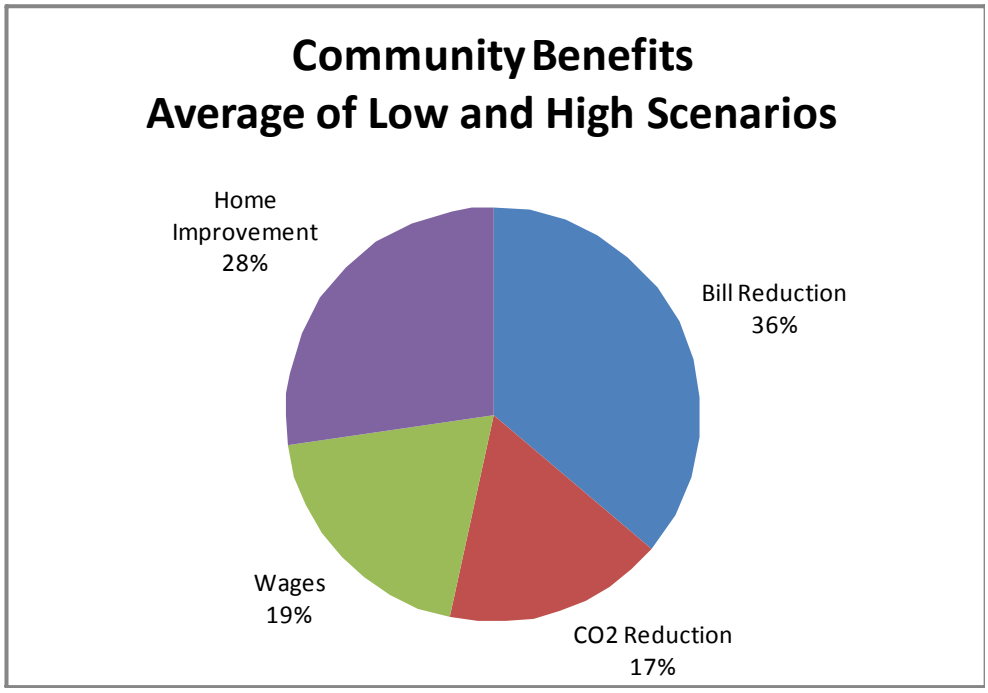


Figure 4: Energy bill reductions are one of several community benefits

The assumptions and results are presented in Table 4 below. The variations between the low and high scenarios are primarily driven by the range of values associated with carbon emissions, home improvement benefits and discount rates.

Benefit-to-Cost Ratio by Scenario			
Results	**Low**	**High**	**Average**
Actual Participants	1.21	1.91	1.56
Participants without ARRA	0.79	1.25	1.02
Ratepayer & Taxpayer	0.72	1.28	1.00
Ratepayer	0.38	1.53	0.96
Society	1.10	1.69	1.40
Berkeley Community	1.47	2.26	1.86
Median	**0.95**	**1.61**	**1.28**
Assumptions	**Low**	**High**	**Average**
Term of Benefits (years)	30	30	30
Societal Discount Rate	3.0%	1.3%	2.2%
Consumer Discount Rate	6.0%	2.6%	4.3%
Cost of Carbon ($/mt)	$ 50	$ 200	$ 125
Home Improvement Benefits as % of Energy Savings	100%	100%	100%
Wages per $1000 of gross costs	$ 270	$ 270	$ 270
Gas escalator	2.2%	2.2%	2.2%
Electric escalator	2.2%	2.2%	2.2%
Initial Marginal Gas Rate	1.15	1.15	1.15
Initial Marginal Electric Rate	0.20	0.20	0.20
Natural gas CO2 mt/therm	0.005302	0.005302	0.005302
Electricity CO2 mt/kWh	0.000178	0.000178	0.000178

Table 4: Benefits vary significantly based on the value of carbon reductions, the value of home improvements and discount rates

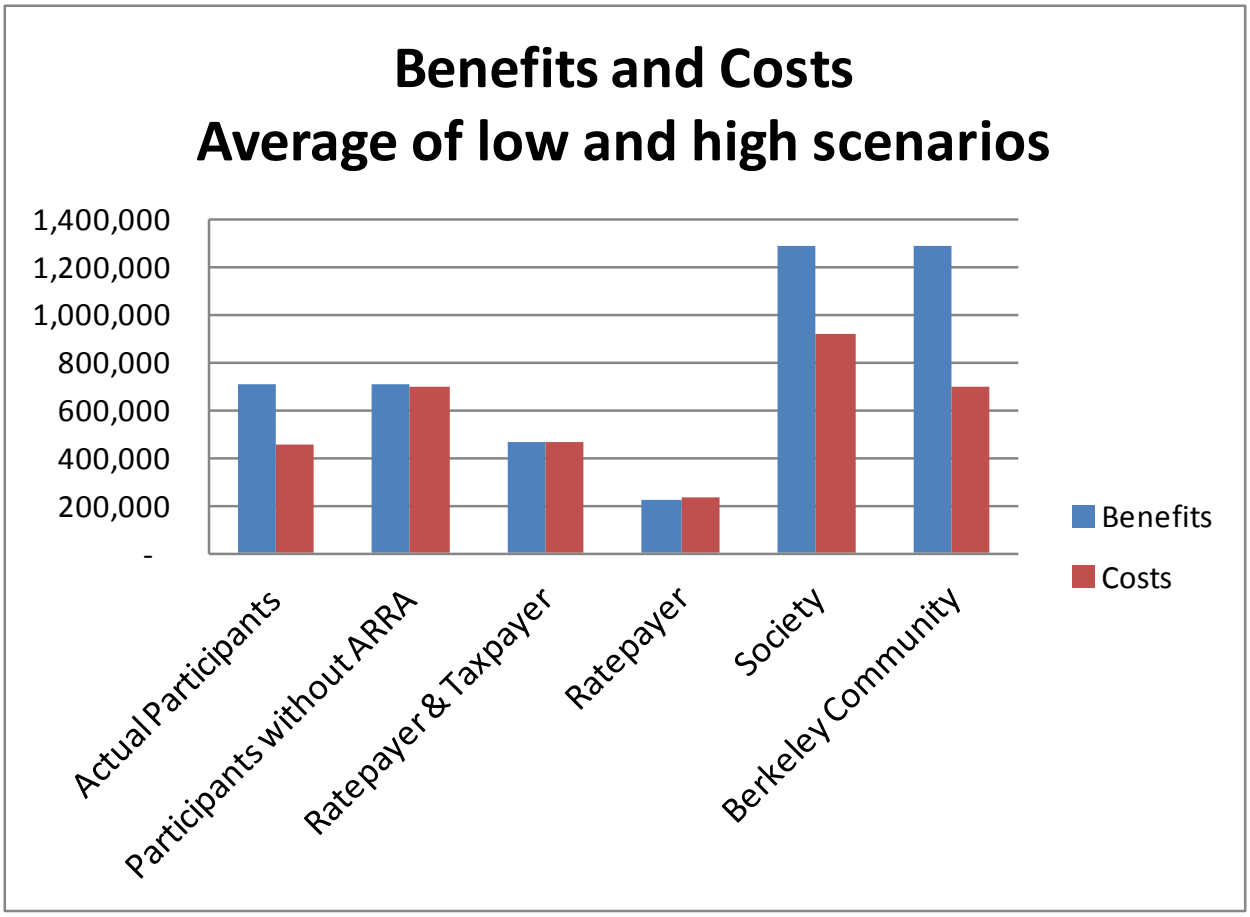


Figure 5: Benefits exceed costs from most perspectives

Energy savings and paybacks vary significantly by project scope. Figure 5 compares the energy savings from baseline consumption, absolute energy savings and paybacks for various scopes. The Basic scope includes air sealing, insulation and/or duct repair, insulation and/or replacement. *Savings from Baseline* represents the energy reduction relative to consumption before the projects. *Absolute Savings* represents the total energy savings, irrespective of prior use. *Payback* represents the energy savings relative to the gross project costs. In each case, the data are normalized relative to the highest scope, e.g., the payback for the Basic and Windows scope is very small relative to the highest payback scope, i.e., the Basic scope. Interestingly, the *Savings from Baseline* are about the same for each scope but scopes that include mechanical equipment have higher absolute savings.

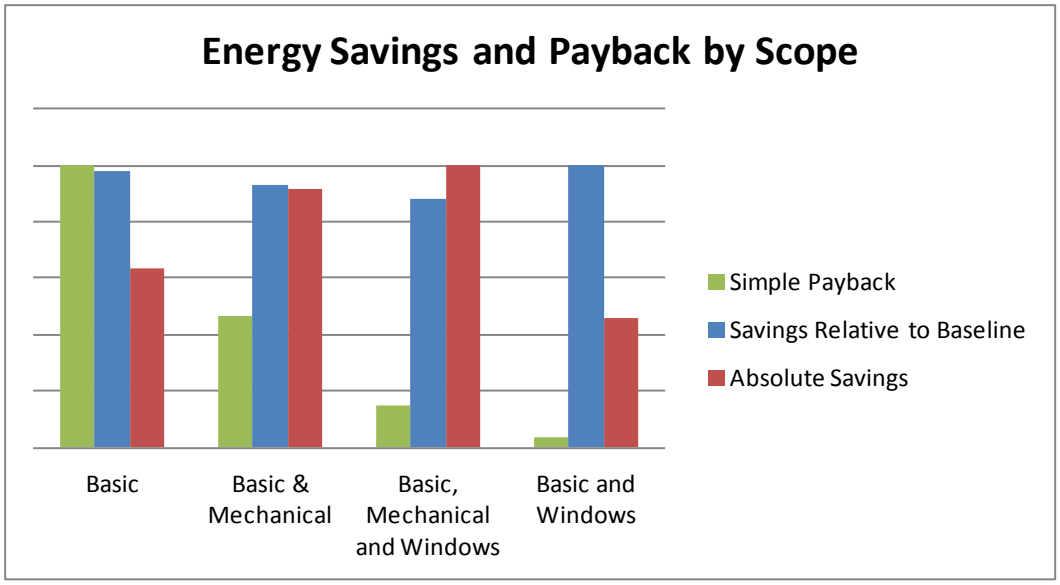


Figure 6: The impacts and paybacks vary by the scope of the projects.

Areas for Further Consideration

Home Improvement Benefits. Additional research is needed on this subject, particularly as it could affect the Total Resource Test used by the CPUC to determine program cost effectiveness. Under the current test, all client costs are included but no client non-energy benefits are included, despite the fact that these benefits appear to be the primary drivers for energy improvements. This value is difficult to quantify but an important motivating factor in investments in energy efficiency. More research is needed to quantify this component of future analyses.

Total Resources Cost (TRC) Test. It may be inappropriate to use the TRC as the test for ratepayer-funded programs in California. The TRC compares utility resource savings (i.e., the avoided cost of procurement and other costs of service) to costs incurred by clients and ratepayers. This perspective assigns no value to non-energy client benefits (which, in the case of single family improvements, are significant motivating factors) but includes the full costs of client investments and, as such, overstates program costs. As Chris Neme of the Energy Futures Group and Marty Kushler of the American Council for an Energy-Efficient Economy argue, the TRC "…usually ignores non-energy benefits that are often critical to market acceptance of efficiency measures and increasingly emphasized in program delivery," and "…it is time to emphasize the program administrator cost test when making utility system resource decisions."[4] Furthermore, the TRC does not consider wages, which provide an indirect benefit to ratepayers, most of whom are employed taxpayers in the region and are therefore beneficiaries.

[4] http://energy.maryland.gov/empower3/documents/ACEEEreferencestudy-NemeandKushlerSS10_Panel5_Paper06.pdf

Data. Current data access practices are unnecessarily restrictive and a major obstacle to best practices with respect to program evaluation and design. This analysis was dependent upon the availability of monthly energy data from program participants. These data, which are not disclosed to the public, are very difficult to obtain due to overly-restrictive guidelines established by the California Public Utilities Commission and followed by PG&E. A modest easing of access to data that would not publicly disclose any customer-specific information would help inform program design and public policy as our communities attempt to achieve climate action goals. For example, this analysis could have been far more complete if data were available for all 265 Berkeley homes that have participated in the ME2 and Energy Upgrade California programs.

Better access to data would help local policy makers consider policies and allocate resources that could directly support the State's energy goals. As it is now, local policymakers are uninformed but nevertheless accountable for energy reductions pursuant to State-mandated local climate action plans.

Calibration of Modeling. Better modeling is needed. The Energy Pro model is not accurate, at least as it applies to the Berkeley climate, building stock and typical resident behavior.

Causes for Increased Consumption. It is important to understand why 12 of the homes used more energy after the improvements. In some cases the increased consumption may be warranted, for example, if a non-functioning furnace was replaced. In others, resident behavior may have been the cause. And in still others, the scope may have been inappropriate. A better understanding could help mitigate these effects.

Market Transparency. The value of the of energy improvements needs to be apparent to stimulate more investment and savings. As noted, current modeling techniques cannot reliably assess potential savings in Berkeley. Furthermore, non-energy benefits are less tangible to a prospective client. Energy asset ratings or other objective assessments may be needed to communicate benefits to potential clients and potential home buyers.

Monetizing Carbon Benefits. One of the reasons for the wide range of results is the uncertainty regarding the benefits associated with reduced carbon emissions. Since this is a major driver for State and local policy, more precision is needed. In addition, the consumer cost of compliance with carbon reductions policies, i.e., rate increases pursuant to cap and trade regulations, are not well understood and have not been monetized into the client energy savings. This would increase the benefit-to-cost ratio in several of the perspectives, including, notably, the participant perspectives.

Financing. Berkeley's rate of participation in the Energy Upgrade California program vastly exceeds other communities in the Bay Area due in most part to the availability of the ARRA subsidies. Innovative financing, such as property assessed clean energy (PACE) programs or on-bill recovery (OBR) may help fill the gap left by the expired Federal Stimulus.

Conclusions

The actual residents that participated in the program are benefitting significantly, in part due to the cost reductions achieved through the Federal Stimulus rebates. Benefits to participants include lower energy bills and home improvements. In the absence of the Federal Stimulus rebates, the same participants would have been somewhat indifferent; the benefits being roughly in balance with the costs, but their participation would provide substantial benefits to the community.

In addition to the benefits that accrue directly to residents, the community benefits through wages paid to local and regional employees and contributions to the City's goal to reduce greenhouse gas emissions. Taken together with lower client energy bills, these benefits substantially exceed the costs. Since the community is paying for the rebates through utility rates whether or not it takes advantage of them, it would be wise to encourage participation.

From the perspective of society as a whole, including utility ratepayers and Federal taxpayers who paid for the rebates, the benefits also significantly exceed the costs. And although it appears that utility ratepayers' costs (i.e., rebates) slightly exceed their benefits (which are limited to carbon reductions in this analysis), the margin is relatively small and it may be possible to close this gap by improving the program in the future.

The analysis reveals that State energy policy, particularly with respect to data access and current methods of evaluating program cost-effectiveness (i.e., the TRC) are outmoded and should be reconsidered.

This pilot shows real and substantial benefits. Given opportunities for improvements, such as consumer education, market transparency, better modeling and project scoping, and innovative financing, it holds promise to provide value to all stakeholders, including residents, the community, society at large and utility ratepayers. In the spirit of the Federal Stimulus, the lessons learned should be applied to a sustained comprehensive home energy retrofit program supported by local and state policies and resources.

Appendix: Benefit and Cost Table

Scenario & Perspective	Benefit to Cost Ratio	Benefits					Costs			
		Total	Bill Reduction	CO2 Reduction	Wages	Home Improvement	Total	Client	Ratepayer	ARRA
Low										
Actual Participants	1.21	546,742	273,371			273,371	452,378	452,378		
Participants without ARRA	0.79	546,742	273,371			273,371	690,741	452,378		238,363
Ratepayer & Taxpayer	0.72	336,593		88,035	248,558		468,208		229,845	238,363
Ratepayer	0.38	88,035		88,035			229,845		229,845	
Society	1.10	1,016,909	406,946	88,035	248,558	273,371	920,586	452,378	229,845	238,363
Berkeley Community	1.47	1,016,909	406,946	88,035	248,558	273,371	690,741	452,378		238,363
Median	**0.95**									
High										
Actual Participants	1.91	863,016	431,508			431,508	452,378	452,378		
Participants without ARRA	1.25	863,016	431,508			431,508	690,741	452,378		238,363
Ratepayer & Taxpayer	1.28	600,697		352,138	248,558		468,208		229,845	238,363
Ratepayer	1.53	352,138		352,138			229,845		229,845	
Society	1.69	1,559,253	527,048	352,138	248,558	431,508	920,586	452,378	229,845	238,363
Berkeley Community	2.26	1,559,253	527,048	352,138	248,558	431,508	690,741	452,378		238,363
Median	**1.61**									
Average										
Actual Participants	1.56	704,879	352,440	-	-	352,440	452,378	452,378	-	-
Participants without ARRA	1.02	704,879	352,440	-	-	352,440	690,741	452,378	-	238,363
Ratepayer & Taxpayer	1.00	468,645	-	220,086	248,558	-	468,208	-	229,845	238,363
Ratepayer	0.96	220,086	-	220,086	-	-	229,845	-	229,845	-
Society	1.40	1,288,081	466,997	220,086	248,558	352,440	920,586	452,378	229,845	238,363
Berkeley Community	1.86	1,288,081	466,997	220,086	248,558	352,440	690,741	452,378	-	238,363
Median	**1.21**									