

DOE Technical Assistance Program

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
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The Parker Ranch installation in Hawaii

Driving Demand for Middle Income Energy
Improvements & Addressing Housing
Issues

Lawrence Berkeley National Laboratory

February 14, 2012

Please join us again:

Title: **Financing Middle Income Energy Improvements**

Date: March 6, 2012

Time: 3:00-4:30 EST

Title: **In-Person Middle Income EE Forum for Practitioners and Policy Makers**

Date: March 26, 2012

Time: 8:00am - 1:00pm at the Hilton Baltimore, MD

Title: **Policies to Drive Greater Energy Efficiency Market Penetration in Middle Income Households**

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For the most up-to-date information and registration links, please visit LBNL's Middle Income Energy Efficiency page at :

<http://middleincome.lbl.gov>



Delivering Energy Efficiency to Middle Income Single Family Households

Environmental Energy Technologies Division
Lawrence Berkeley National Laboratory

Authors:

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December 2011



Today's Presenters

Gavin Hastings

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APS Home Performance with ENERGY STAR® Program

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(NYSERDA)
NYSERDA Home Performance with ENERGY STAR® Program

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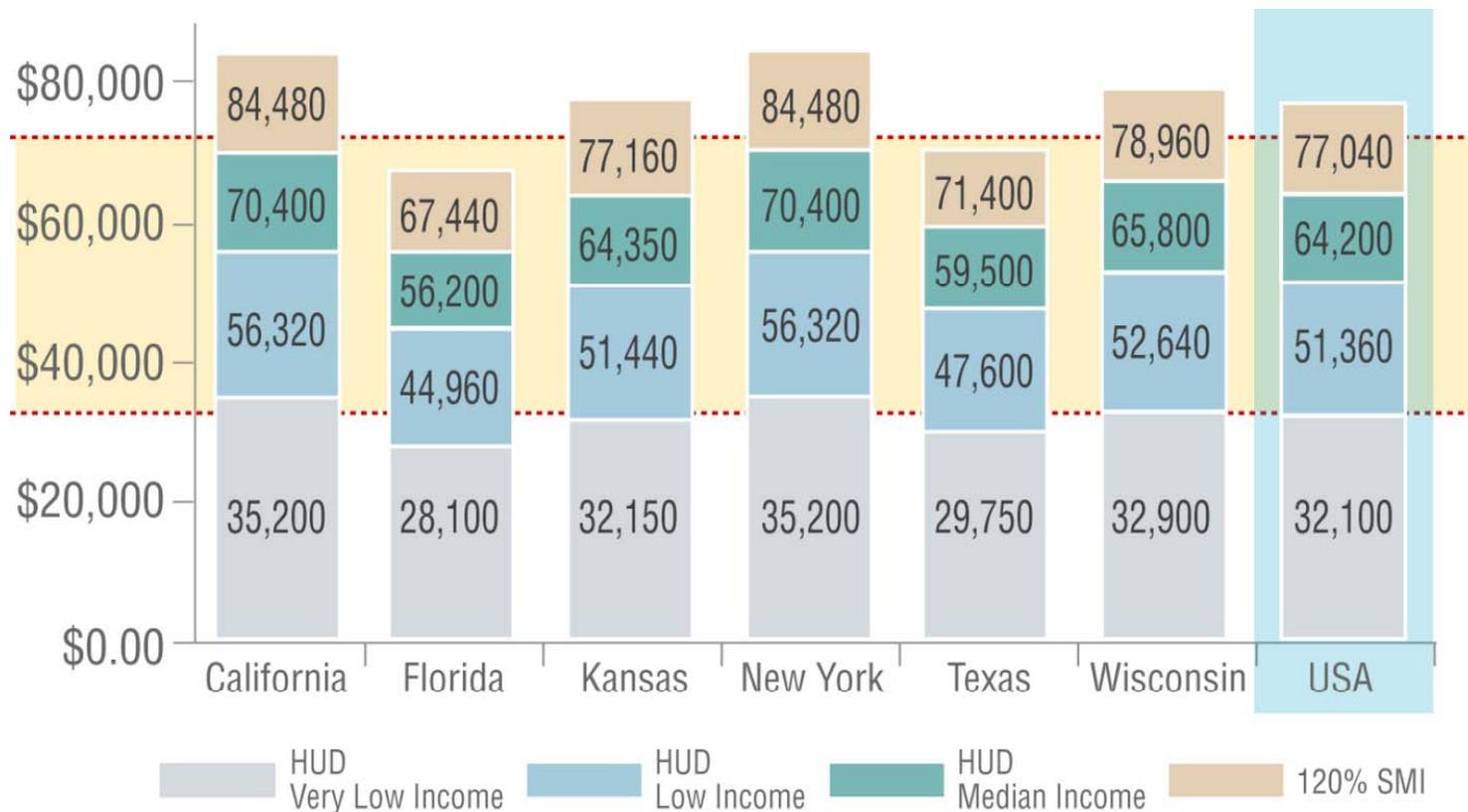
Mark Wolfe

Executive Director, Energy Programs Consortium (EPC)
Weatherization, Rehab & Asset Preservation (WRAP) Pilot

Defining Middle Income (MI) Households



We define “middle income” as the middle third of U.S. households by income, who earn \$32,500 to \$72,500 annually (see shaded area between red dotted lines). Our definition overlaps HUD’s “Low and Median Income” designation in many states.

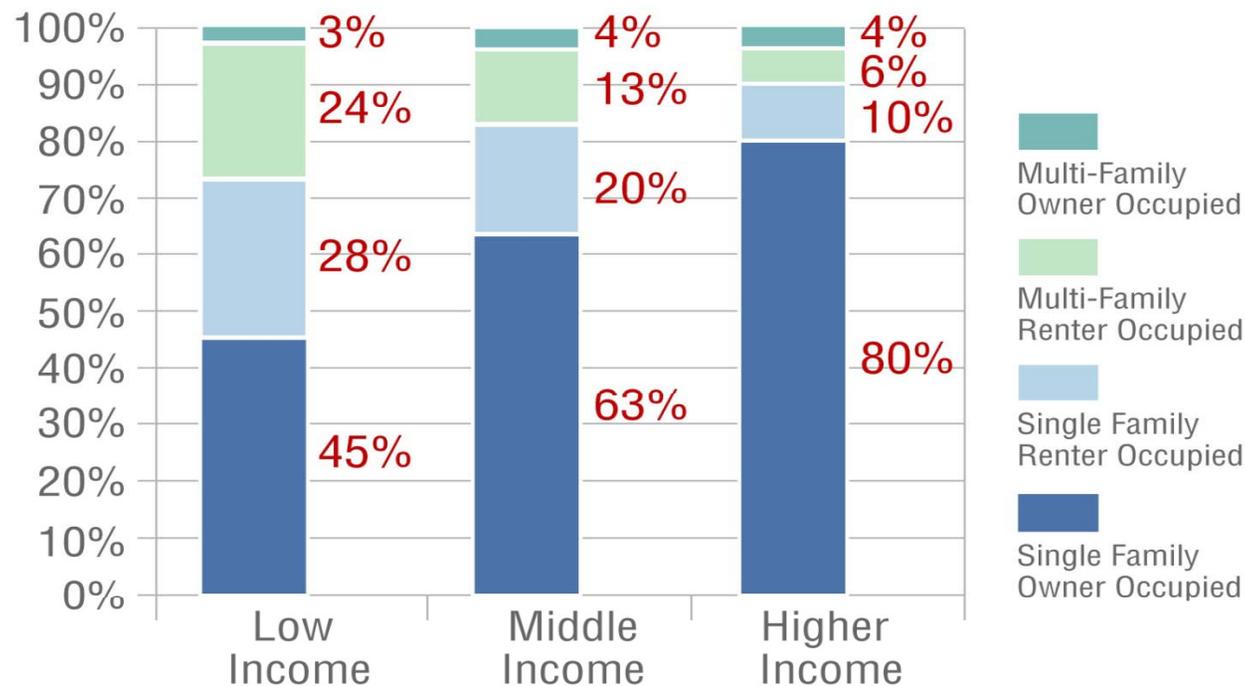


Targeting Middle Income Households



Most middle income (MI) households live in, and own, single family homes—single family homes are the focus of this report*

- 83% of MI households live in single family homes
- 67% of MI households own their homes or apartments



* Single family homes include mobile homes and 1-4 unit dwellings

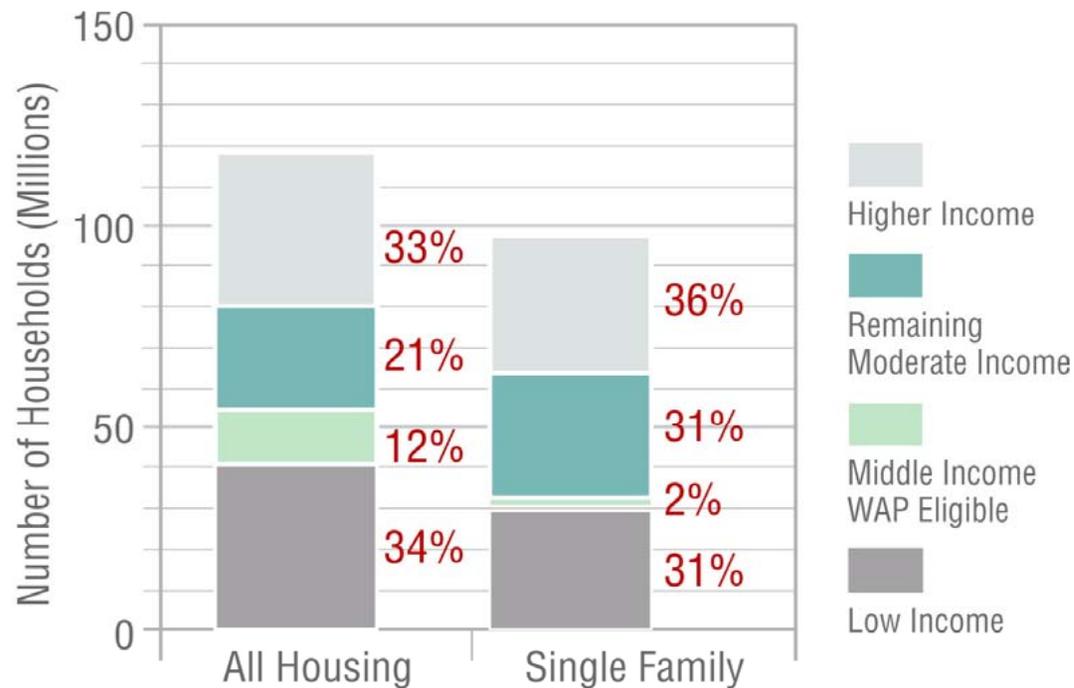
Source: U.S. Census. 2010 Current Population Survey.

MI Households & Energy Assistance



Most middle income households do not qualify for energy assistance programs like the Weatherization Assistance Program (WAP)*. They are offered the same incentives for energy efficiency programs as their higher income peers.

- 36% of all MI households qualify for WAP, but they are concentrated in multi-family rental units.
- Just 6% of single family households qualify for WAP



* The Department of Energy's Weatherization Assistance Program offers low income households free basic weatherization improvements.

Source: U.S. Census. 2010 Current Population Survey.

Opportunities for Reaching MI Households

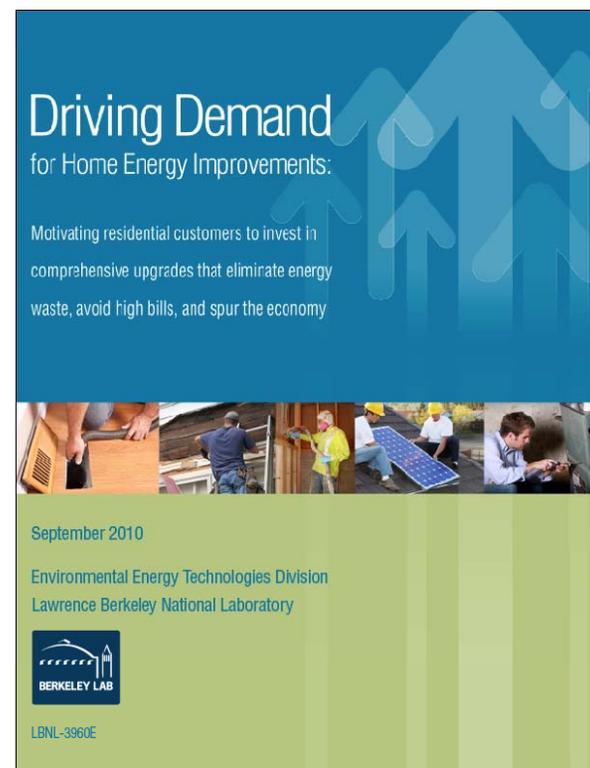


General strategies outlined in LBNL report,
“Driving Demand for Home Energy Improvements”

www.drivingdemand.lbl.gov

Tailored Strategies for MI households:

- Reduce the Cost of Upgrades
- Reduce Participant Risks
- Use Trusted Messengers
- Solve a Problem that Households Recognize
- Make it Easy, but Not Too Easy



Addressing Building Issues



- Many MI households have building structure and maintenance issues that can reduce their property value and adversely affect the health and safety of their occupants.
 - Households are often aware of these problems, but in an uncertain economy, they are either reluctant or unable to afford fixes before problems turn into emergencies.
 - Some issues must be addressed before making EE upgrades.
- Addressing these issues as part of energy efficiency program delivery can attract more participants and address important structural and safety risks.



Driving Middle Income Demand:

Comprehensive Retrofitting through a Series of Smaller Steps

Gavin Hastings
Arizona Public Service



Keys to Home Performance

- Create Demand
 - Awareness/Credibility
 - Brand Recognition
 - Address Customer Needs
- Building Infrastructure
 - Training
 - Contractor Profitability
- **Managing Costs**
 - Direct Customer Rebates or Incentives
 - Financing
 - Manageable project size



Challenges for middle income home owners

- Hesitant to make large investments
 - Average HPwES Projects \$5,000 to \$15,000
 - Reluctant to Finance
- Unsure of the energy savings potential
 - Lots of market confusion
- Poor value proposition
 - Little to no impact on property value

Redefining Home Performance

- Make comprehensive plans, not projects
- X% is a **long term goal**
- Create relationships through multiple transactions
- Get the basics right
- Make it manageable
- Equipment (HVAC and Water Heater)
 - Get the most out of what you have
 - Avoid the crisis decision

Examples

- House Characteristics
 - 1500 sq. ft
 - Built 1970
 - Central AC (8 years old)
 - Water heater (11 years old)
- Customer Motivators
 - High energy bill
 - Uncomfortable bedroom

Option 1: The 20% Saver

- Install CFL's
- Low Flow Shower Heads
- Seal Duct System
- Solar Screens
- Air Sealing Attic
- Upgrade attic insulation from R-19 to R-38
- Install new high efficiency water heater
- Install new 14 SEER AC Unit

Total: \$12,000 to \$15,000

Option 2: Your Performance Path

- Stage 1: Immediate (\$1,000 to \$3,000)
 - CFL's
 - Low Flow Shower Head
 - Shade Screen
 - Duct Seal
 - AC Tune Up
- Stage 2: 1-2 Years (\$1,500 to \$3,000)
 - Air Seal
 - Insulate Attic

Option 2: Your Performance Path

- Long Term:
 - Replace Hot Water Heater (3 to 5 years)
 - Burnout response plan
 - Install New AC Unit (5 to 8 years)
 - Proper Sizing Unit
 - Quality Install
- Ongoing
 - AC Tune Up and Performance Maintenance

Addressing the Challenges

- Hesitant to make large investments:
 - Break the investments in to smaller increments
 - Help plan major replacements and avoid crisis decisions.
- Unsure of the energy savings potential:
 - Allow smaller investment to prove value and sell next steps.
- Poor value proposition
 - Address concerns through smaller investment
 - Better value out of equipment replacement

Additional Benefits

- Contractor Sustainability
 - Improved revenue streams
 - Less lost opportunity
- Program benefits
 - Ongoing payout on initial investment
 - Highly targeted marketing
 - Behavioral opportunities

Barriers to success

- Programmatic:
 - Auditing requirements
 - Tracking and customer management
 - Incentive flexibility
- Policy:
 - Program objectives
 - Utility cost effectiveness testing
- Contractor:
 - HVAC business model
 - Intelligent customer relationships

Enhanced Opportunities

- Reinforce with behavioral
 - Home energy reports (Opower, etc)
 - Incentives (rates or direct)
- Smart incentives
 - Targeted incentives that boost participation on demand (i.e. special financing, etc.)
- In-Home Display and Smart Meter Programs

Things to Remember

- 1) Home Performance is a *Plan* not a project.
- 2) Get the basics done right.
- 3) Make the Steps Manageable.

Thanks!

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LBNL Webinar Middle Income Household Efficiency Series

February 14, 2012

Driving Demand for Energy Improvements &
Addressing Housing Issues in NYS

John Ahearn
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NYSERDA



NYS Homeowners and Energy Efficiency

In July 2011, a total of 1,012 homeowners located across New York participated in research to help NYSERDA better understand:

- How they view home energy consumption
- The importance they place on energy saving solutions
- Why they would consider taking advantage of programs that increase energy efficiency

Market Insights ⁽¹⁾

There's a strong interest in energy efficiency

- More than half (56%) of New York homeowners plan to make home energy efficiency improvements, 87% within the next 3 years

Comprehensive home assessments make sense; it's the preferred first step

- Before tackling energy efficiency, 88% are likely to obtain a comprehensive home energy assessment

Market Insights ⁽²⁾

Money matters...as a motivator and as a barrier to energy upgrades

- 72% say saving money on energy bills is the main reason to make energy upgrades, with wasting less energy and making their home more comfortable the second and third reasons

Most prefer to tackle energy efficiency project by project

- 79% would prefer to make energy upgrades one or two at a time, as their budget and time allows
- Only 33% say they would finance upgrades through a loan

Market Insights ⁽³⁾

Investment thresholds differ by income levels

- The “optimal” price point on an energy upgrade package for households with income above \$75k is \$5,000. Incomes below \$75k say their optimal spend is \$3,000.

People want a relatively short payback period

- 70% indicate they would invest in energy efficiency if the payback period were 3 to 4 years

Market Insights ⁽⁴⁾

68% recognize their home is not energy efficiency

- 56% say the windows are not airtight; 46% say there is not enough insulation; 46% say doors are not airtight; 39% say energy bills are too high; 32% say their furnace or air conditioning is not efficient; 30% say heating or cooling is uneven

Many factors don't seem to make a difference when considering energy upgrades

- Where a home is located in New York and its age, or the income level of the homeowner, doesn't come into play in whether people believe their home is energy efficient or not
- How much a homeowner currently spends on energy or the notion that upgrades will improve the value of a home is also irrelevant

Assisted Home Performance with Energy Star®

Targets households with incomes below 80% of area median income

50% grant up to \$5,000 with low-interest rate financing available for the balance

Assisted HPwES accounted for 35% of total 6,847 completions in 2011

231 (25%) of 920 total loans in 2011 were for Assisted customers

Residential Energy Loans

Revolving Loan Fund initially capitalized by \$25 million from Regional Greenhouse Gas Initiative with Loan Loss Reserve (\$9 million) funded by Better Buildings Neighborhood Program

Two residential loan options: On-Bill Recovery at 2.99% or Unsecured at 3.99 % (3.49% with ACH)

Both offer loans up to \$13,000 (\$25,000 if the estimated simple payback is less than 15 years) for terms of 5, 10, or 15 years

Non- Energy Housing Issues

Loans can include up to \$2,000 for health and safety issues including:

- Asbestos abatement or electrical efficiency upgrade for new heating/cooling unit
- Upgrade of knob & tube wiring in order to install insulation
- Radon and lead abatement
- Removal or repair of oil tank
- Repairs due to water damage, molds and mildew, ice dams or other symptoms of poor building performance

Associated costs up to 15% of the eligible work scope up to \$2,000 can be removed from the SIR calculation

Driving Demand for Middle Income Energy Improvements

Community Energy Services:

*A Pilot Full-Service Residential Energy Efficiency
Program in Minneapolis, MN*



Community Engagement



- + Neighborhood-specific outreach
- + Community-based social marketing
- + Mandatory presentations

The Recipe for an Energy Smart Home



Good Habits



Good Products



Good Investments

Home Energy Visits



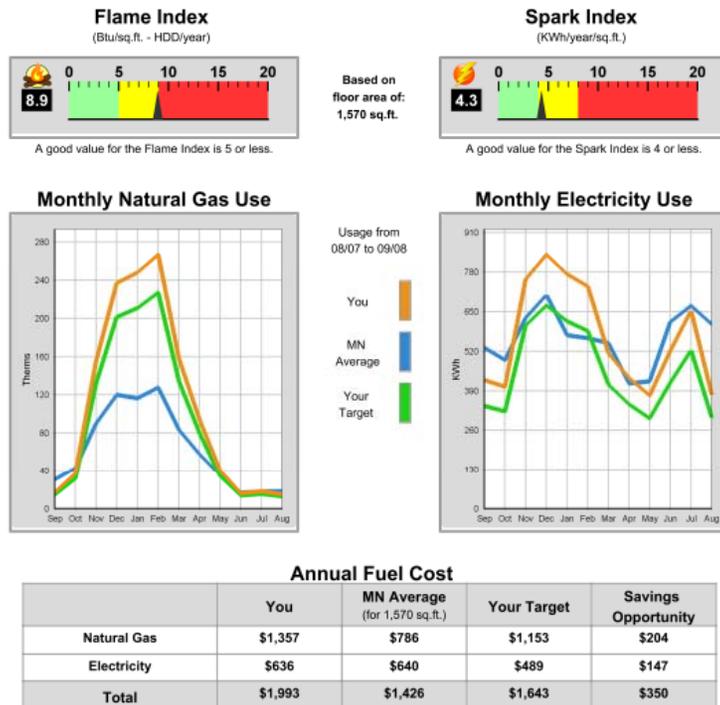
- + \$30 co-pay
- + 1 ½ - 2 hour visit
- + 2 energy experts
- + Direct installation of materials
- + Blower door test and insulation checks
- + Instant results and prioritization

Follow-Up

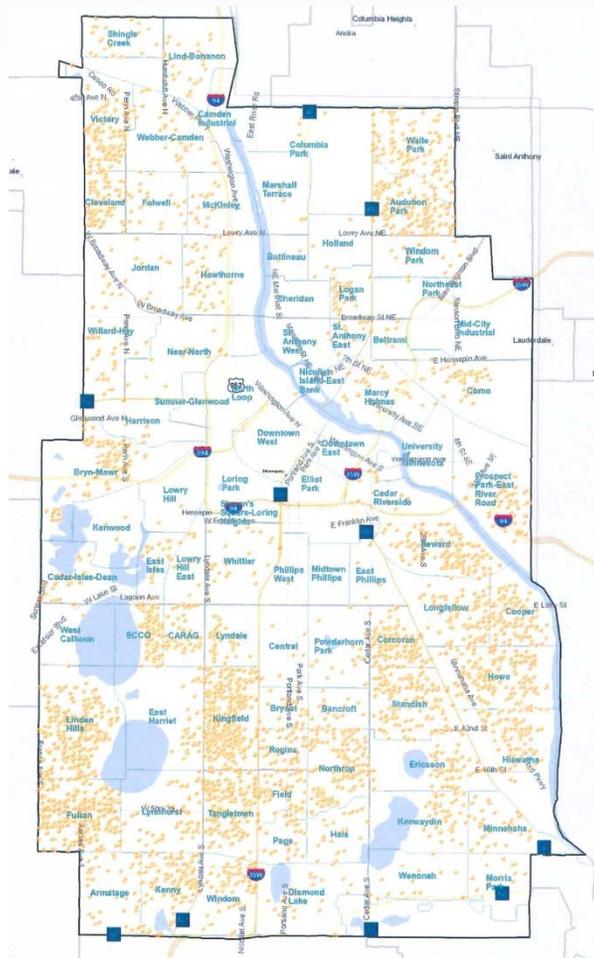
- + Home energy reports
- + Training and quality control for contractors
- + Low-interest financing
- + At least two contacts post-visit



Your Home Energy Snapshot



❖ Preliminary Results (9/2009 – 2/8/2012)



4,719
homes

1,186
upgrades

*28% of homes with
a recommendation
completed an
upgrade*



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Energy Efficiency and Homeownership



MARK WOLFE
EXECUTIVE DIRECTOR, ENERGY PROGRAMS
CONSORTIUM

FEBRUARY 14, 2012

Importance of Energy Efficiency and Weatherization programs



- Mechanism to maintain low-income homeownership
- Energy as a major expense for low-income households
 - For households at 150% of poverty or below, energy costs are 16% of their income
 - For non low-income households, energy costs are 4-5% of their income
- Do not have the funds for needed improvements, including roof repair, window replacement, electrical work, etc.
- Low- and moderate-income families are more likely to own older homes that are poorly insulated and have less energy-efficient HVAC systems and appliances
- Savings are likely to be most dramatic than for newer construction
- Low and moderate income households are good candidates for weatherization

Weatherization, Rehab, and Asset Preservation Pilot Program



- Began in 2002 in 11 towns and cities across the country.
- Local agencies consolidated into one program or umbrella a host of home repair and weatherization programs and funding sources
- Designed as a “one-stop shop” program, to integrate social services with weatherization and home improvement programs.
- In each city, the model provided a housing counselor to assist homeowners in completing a master form/blended application
- The counselor helped homeowners to file program applications, and served as their advocate as specific packages were proposed.

Details of WRAP process



- Homeowner deemed eligible
- Housing specialist conducts a complete home energy audit and prepares a work write-up for the home.
- Then develops an affordable plan for the renovation and weatherization of the home
- The housing specialist supervises the selection of approved contractors, coordinates and monitors the improvement schedule, and approves payments.
- A case manager helps homeowners complete a master application form
 - Helps identify the social service programs and the rehab and weatherization grant and loan programs they might be eligible for.
- The case manager also helps them file program applications and serves as their advocate as decisions are made regarding the specific benefits provided to applicants.
- The case manager also enrolls participating families in courses designed to help them learn financial literacy, home maintenance and other basic skills.
 - *Ex: One pilot program family was paying about \$2,000 for insurance, more than double the local average. The case manager encouraged the family to enroll in a seminar sponsored by their local insurance company. It was determined that the family did not need flood insurance, thereby reducing their insurance premium by \$942.*

WRAP outcomes



- Two WRAP sites with the highest percentages of moderate-income clients used loans to substantially increase the assistance they provided for each client.
 - Secured between \$5,200 and \$7,050 in grants per unit
 - Were able to double or triple that amount with loans
 - Demonstrated successful leveraging
- Families can expect to save at least 20 percent on their home energy bills as a result of the weatherization portion of the WRAP program.
- The average WRAP family is projected to save about \$340/year on its energy bills as a result of the weatherization assistance provided by the project.
- The combination of weatherization, renovation, social and financial services helps homeowners lower their energy costs and enables them to better meet the financial requirements needed to sustain home ownership.
- Consequently, families can be more secure in their homes and more invested in their neighborhoods.
- Their homes will increase in value as a result of the quality of repair work.

Lessons Learned from WRAP



- The retrofit focus for low- and moderate-income households has been on 100% grant funded weatherization
- However, the WRAP program showed that once families achieve an income of about 60% of national median income, a mix of loans, grants and incentives can meet their needs.
- Can finance weatherization with more than grants alone
- Households earning more than 60% of national median income, or \$30,182, are able to finance a portion of energy efficiency improvements
 - If financing package includes some grant funding, rebates, or other incentive

Lessons Learned



- **To best serve moderate-income homeowners, energy efficiency financing packages must be tailored to meet the limited incomes of working families**
 - Robust protections to ensure added debt does not put the homeowner's ability to keep their homes at risk
 - Be user friendly allowing one application to serve as a single gateway to all relevant programs (common form income certification)
 - Have counselors or staff to help navigate the administrative process
 - Financing plans that utilize all available grant and other cash programs as a base, followed by low interest loan program options, including PACE, and on-bill finance

Lessons Learned



- WRAP showed clearly that energy retrofits alone can not meet the needs of all families; there is need for rehabilitation as well
- Integrating these programs is not easy
- These programs are typically administered by different local agencies and have different eligibility requirements and standards
- WRAP proved, however, that it can be done and that homeowners are better served when weatherization and rehabilitation programs are integrated.

Limitations of grant-funded weatherization



- WRAP showed the importance of integration and ways to leverage weatherization funds
- Insufficient funds available to offer weatherization services to more than a fraction of the eligible population.
- Loans offer considerable value in expanding the program
 - Energy savings can be used to pay back all or a portion of the debt.
- Considerable debate within the low income community about if loans should be offered to lower income families
- Can low to middle income families qualify for loans?
- There is a perception all of these families have poor credit scores and are unable to take on debt
- Data shows this is not the case

Credit Score Data



- Recently EPC was able to access credit score data by income bands under a contract with a national market research firm, who analyzed credit score data from the TransUnion credit bureau

Table 1: Credit Score by Income for All Households

Credit Scores	< \$30K	\$30-\$50K	\$50-\$80K	\$80-\$100K	\$100-\$150K	\$150K +	Totals	Percent of Total
801 +	596,711	684,525	1,262,339	243,090	771,667	187,108	3,745,440	4%
751-800	2,871,866	3,812,126	9,350,502	2,152,433	7,652,485	1,769,312	27,608,724	30%
701-750	2,766,271	3,597,431	7,887,414	1,370,370	3,739,833	760,617	20,121,936	22%
651-700	3,104,937	3,534,897	5,996,736	791,913	1,702,720	333,346	15,464,549	17%
600-650	3,154,128	3,079,433	4,011,999	441,612	802,019	162,575	11,651,766	13%
<600	4,934,271	3,773,607	3,549,581	337,346	573,639	123,881	13,292,325	14%
Totals	17,428,184	18,482,019	32,058,571	5,336,764	15,242,363	3,336,839	91,884,740	100%
Total: 650+	9,339,785	11,628,979	24,496,991	4,557,806	13,866,705	3,050,383	66,940,649	73%
Total: < 650	8,088,399	6,853,040	7,561,580	778,958	1,375,658	286,456	24,944,091	27%

Note: 18.7 million households not included because do not have credit score data and 33.3 million households not included because do not have income data. May be overlap between these two groups.

Table 2: Credit Scores by Income for All Households - % of Total

Credit Scores	< \$30K	\$30-\$50K	\$50-\$80K	\$80-\$100K	\$100-\$150K	\$150K +
801 +	3%	4%	4%	5%	5%	6%
751-800	16%	21%	29%	40%	50%	53%
701-750	16%	19%	25%	26%	25%	23%
651-700	18%	19%	19%	15%	11%	10%
600-650	18%	17%	13%	8%	5%	5%
<600	28%	20%	11%	6%	4%	4%
Total	100%	100%	100%	100%	100%	100%
Total: 650+	54%	63%	76%	85%	91%	91%
Total: < 650	46%	37%	24%	15%	9%	9%

Credit Score Data



- 54% of households earning less than \$30,000 annually have credit scores of 650+
- 63% of households earning \$30,000 to \$50,000 annually have credit scores of 650+
- 76% of households earning \$50,000 to \$80,000 annually have credit scores of 650+
- Many low and middle income households have decent to good credit scores

Contact Information



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Questions?

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