Delivering Energy Efficiency to Middle Income Single Family Households

Environmental Energy Technologies Division
Lawrence Berkeley National Laboratory

Authors:
Mark Zimring, Merrian Goggio Borgeson,
Ian Hoffman, Charles Goldman, Elizabeth Stuart,
Annika Todd, and Megan Billingsley

December 2011

Research question & methods

How can programs motivate and enable middle income single family households to seek out comprehensive energy upgrades?

Research Methods:

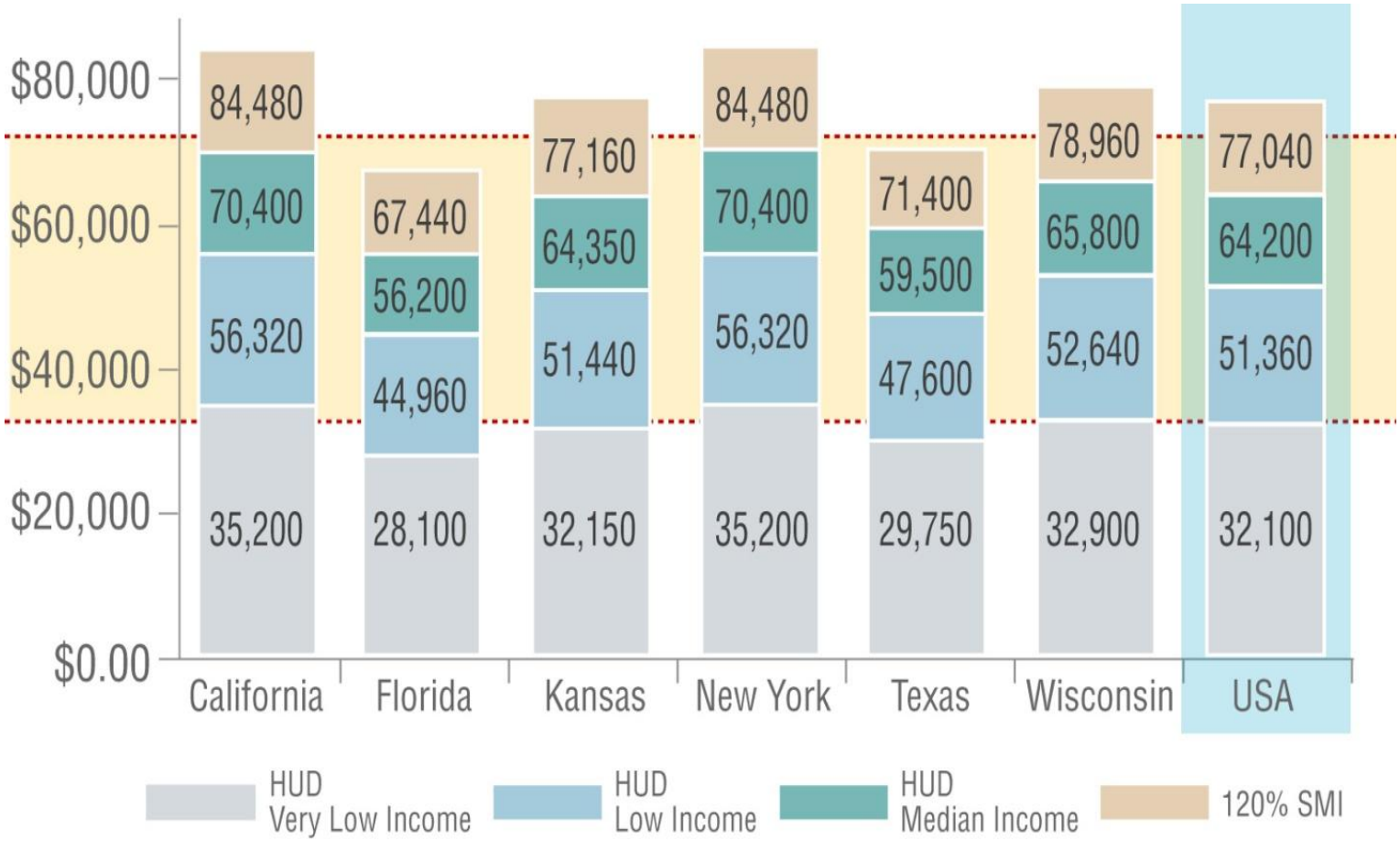
- ✓ Interviews with more than 35 program administrators, policy markers, researchers, and other experts
- ✓ Case studies of programs—insights from more than 30 programs and 4 longer case studies
- ✓ Review of relevant reports and presentations on the characteristics of middle income American households
- ✓ Analysis of relevant demographic, housing, energy use, and financial data

Download the report and other resources at:

http://middleincome.lbl.gov/

Defining middle income (MI) households

The middle third of U.S. households by income earn $32,500 to $72,500.



Source: U.S. Census. Current Population Survey, Annual Social and Economic (ASEC) March 2011 Supplement

Why MI energy efficiency matters

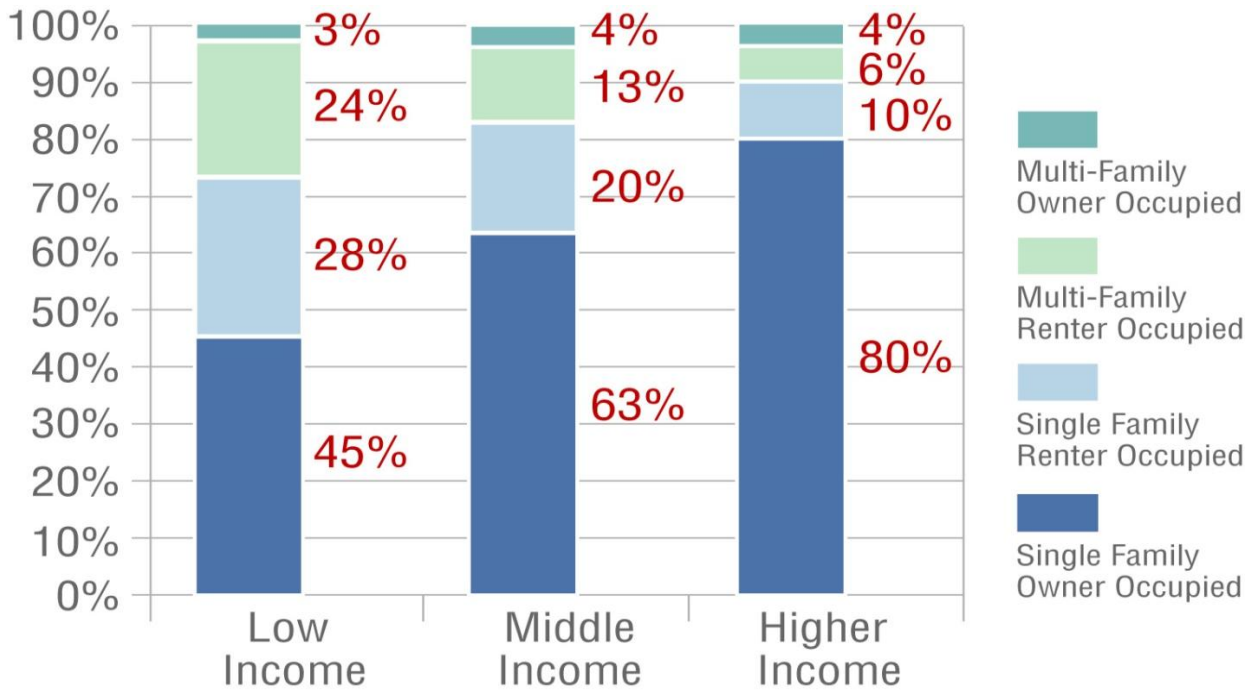
- **Middle income households use 1/3 of residential energy—reducing this energy use can deliver public and private benefits**
  - **Public benefits: reducing power system costs, easing grid congestion and avoiding emissions of greenhouse gases and other pollutants**
  - **Private benefits: lower energy bills, increasing the structural integrity of homes, improving health and comfort, and reducing exposure to rising energy prices**

- **Middle income households pay the taxes and utility bill payer charges that fund public energy efficiency programs**
  - **It is important that benefits of these programs be distributed more broadly—especially given the saving potential in middle income homes**

Most are single family, owner-occupied

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

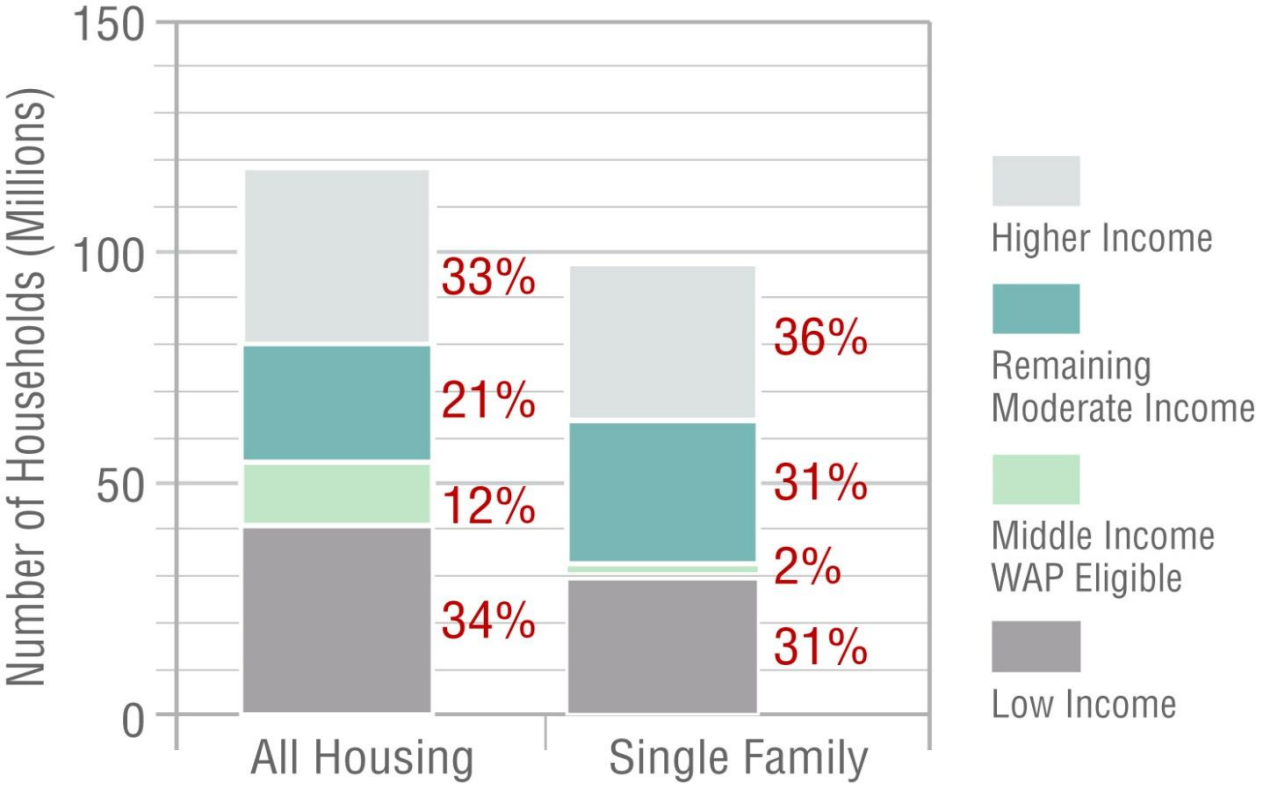


* Single family homes include mobile homes and 1-4 unit dwellings

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

Few qualify for free programs

Most middle income households do not qualify for energy assistance programs like the Weatherization Assistance Program (WAP).* **Just 6% of MI single family households qualify for WAP.**

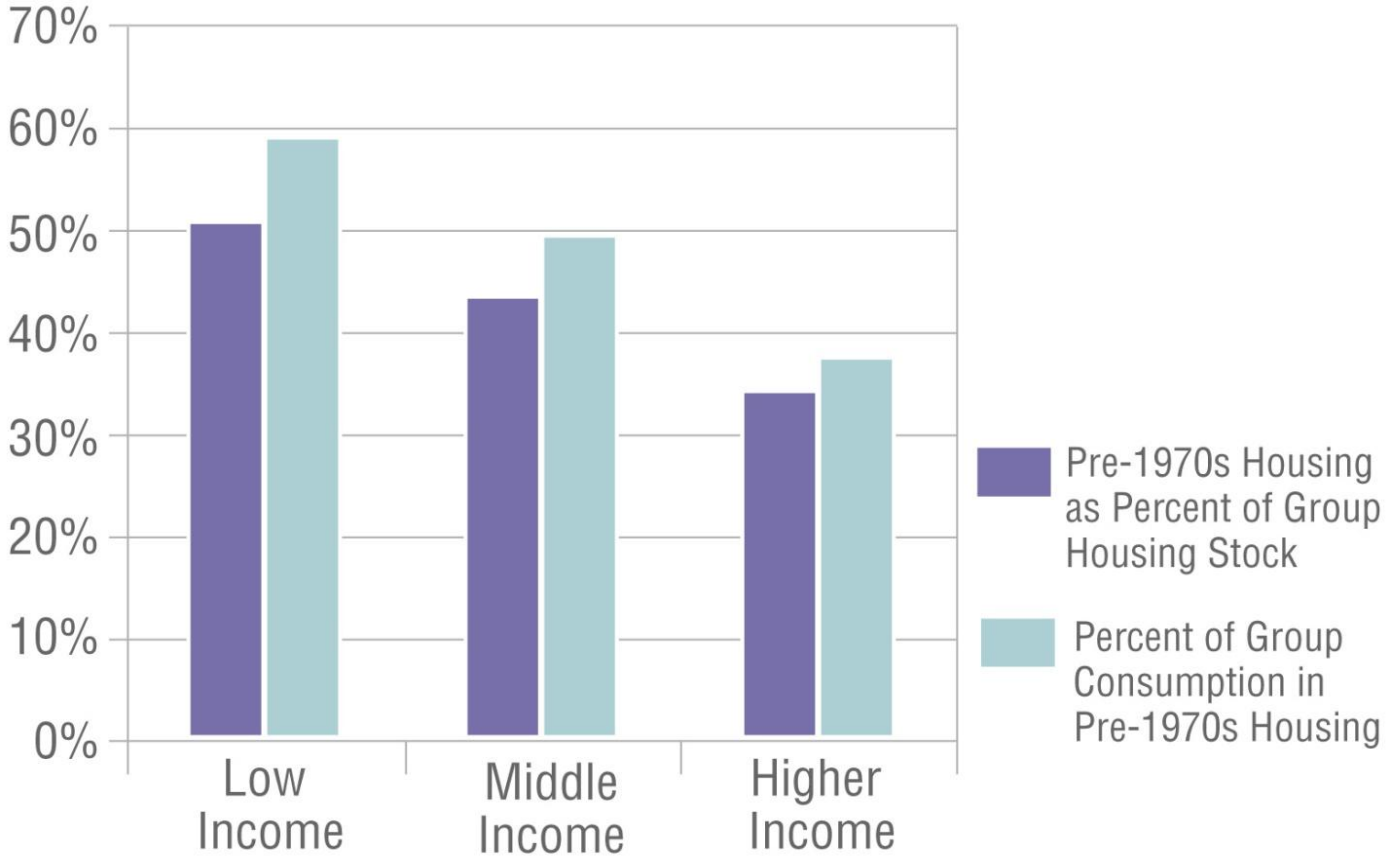


*** The Department of Energy's Weatherization Assistance Program offers low income households free basic weatherization improvements.**

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

MI homes are older & occupied longer

On average, MI homes are older than the homes of higher income households, and MI households tend to stay longer.

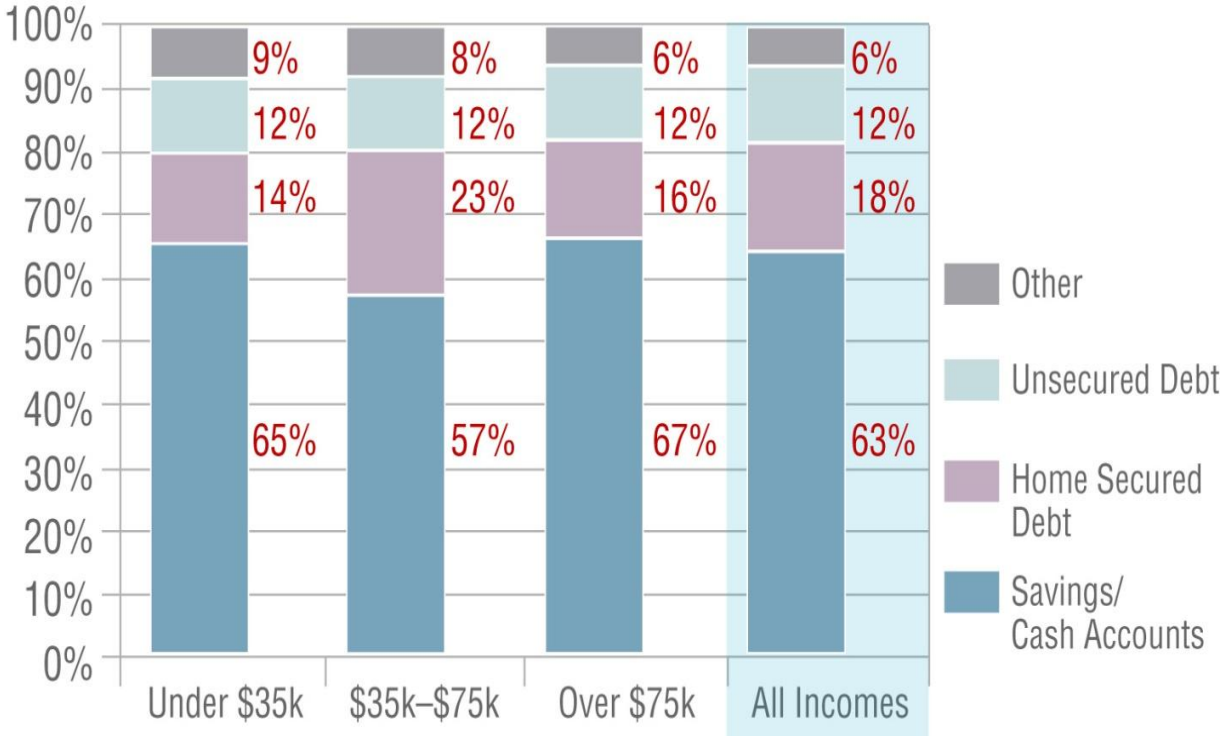


Source: U.S. Energy Information Administration . 2005 Residential Energy Consumption Survey.

Financing is important for this market

The upfront cost of home energy improvements is a significant barrier to investment. Energy upgrades for just 1/3 of the 32 million MI single family households would require $30-$100 billion.

Home Improvement Financing Patterns by Income in 2001

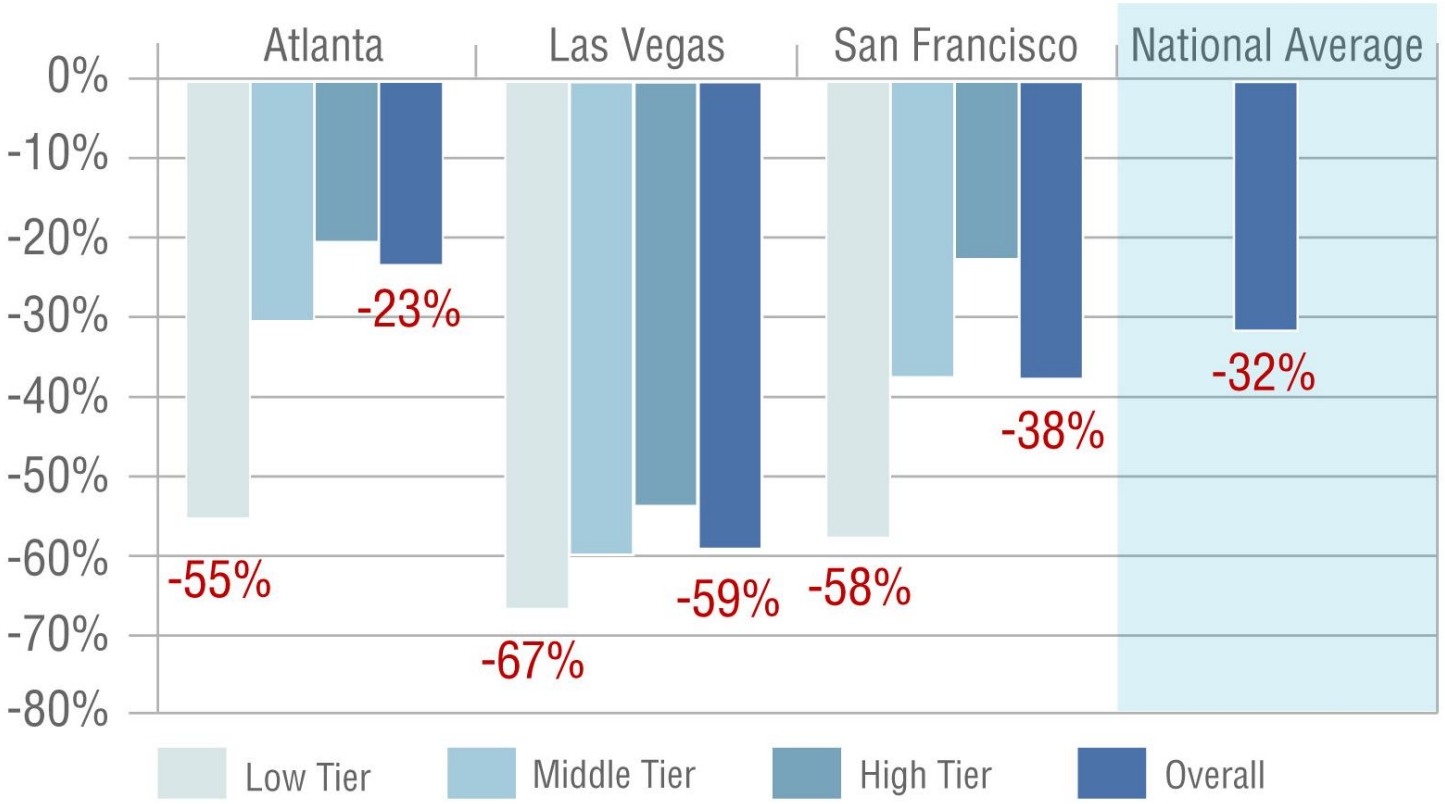


Source: Guerrero, A. M.. 2003. *Home Improvement Finance.* Joint Center on Housing Studies, Harvard University.

Declining home values restrict financing

Single family home values—the primary vehicle for MI home improvement financing—have declined by 32% since the housing market's 2006 peak.

→MI homes have fared worse.

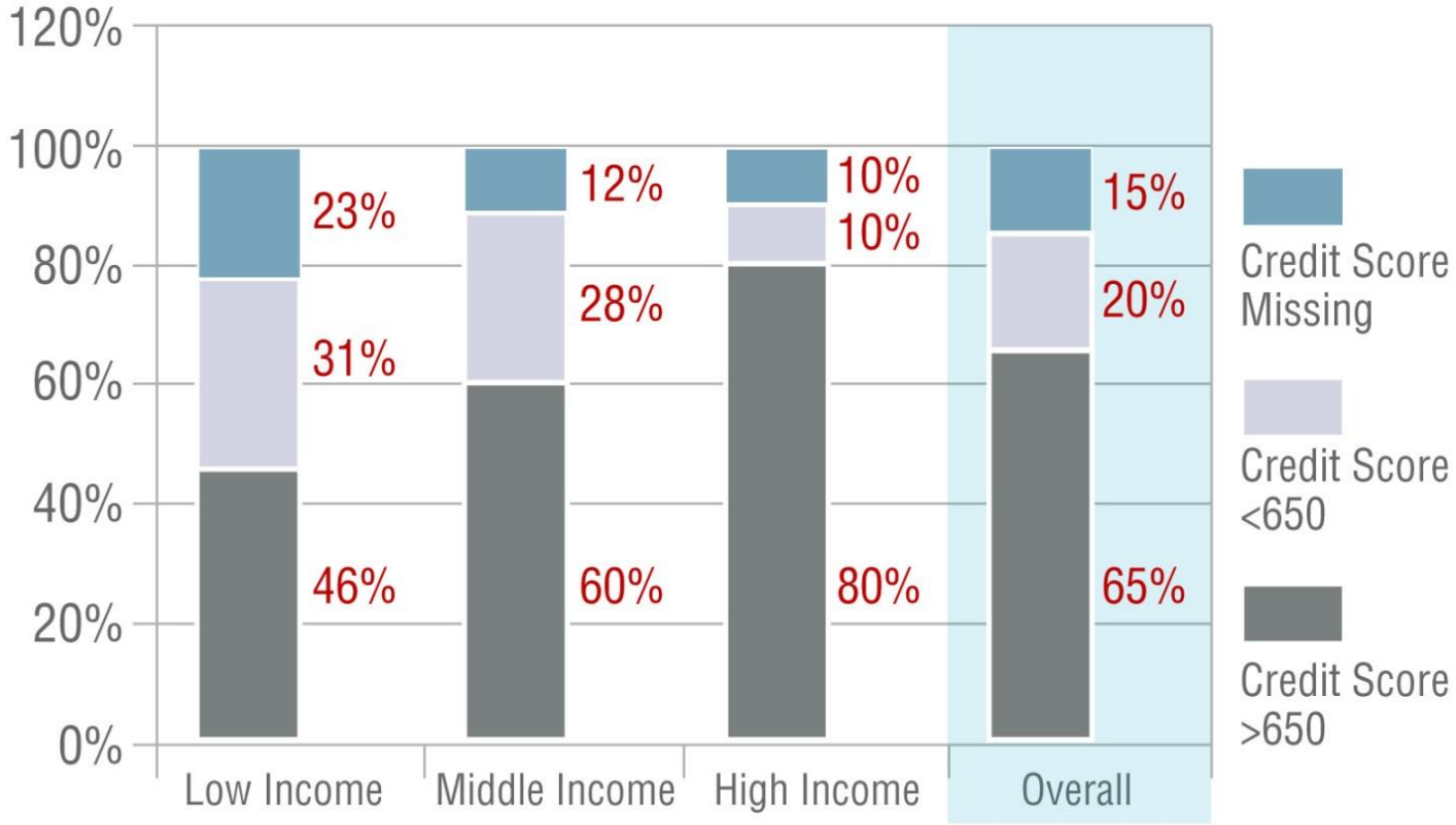


Source: *Seasonally-adjusted S&P/Case-Shiller Home Price U.S. National Index Level Q2-2011*

Lower credit scores in this market

Credit scores are a key metric for lenders in evaluating creditworthiness.

MI households are likely to have lower credit scores than their higher income peers.



Source: Due to data limitations, for the purposes of the credit score analysis we use household income of $30,000 to $70,000 to define middle income. Credit score data from Energy Programs Consortium; based on analysis of TransUnion credit data from Intellidyn.

Higher loan rejection rates

At the same time that access to home-secured financing has declined, the largest energy efficiency loan programs are rejecting 30-50% of applicants.

- MI households are rejected at higher rates than higher income households

Keystone HELP loan application, approval, funding and loan size rates (by income) – January 2010-August 2011

Household Income	# Applications (% of Total Applications)	Applications Approved (Approval Rate %)	Loans Funded (Approval → Loan Conversion Rate %)	Average Loan Size
<80% AMI	~4,000 (40%)	~1,720 (43%)	~1,000 (58%)	~$7,500
≥80%AMI	~6,000 (60%)	~4,140 (69%)	~3,000 (73%)	~$9,500

Solutions?

→ Make EE more attractive

→ Increase access to capital (responsibly)

→Public policy must be part of the solution

This market segment is risk-adverse

- **Financial strain and the risk of investing in a product with benefits that are perceived to be uncertain make energy efficiency a tough sell for MI households.**

"Many people would rather pay more per month on their utility bills than have a $6,000 loan hanging over their heads at a time that they are really concerned about keeping their jobs amid the weak economic outlook."

-Todd Conkey, Wisconsin Energy Conservation Corporation

Big $$ spent on home improvements

- Millions of MI households are performing some type of home improvements every year. From 2008 to 2009, they spent $83.6 billion. About $18.2 billion of these MI home improvements – roughly 22 percent – were potentially energy-related.

- These numbers suggests a huge opportunity for realizing efficiency by "nudging households" into more efficient materials and equipment and then incentivizing add-ons.

Source: 2009 U.S. Census

Difficult to get their attention

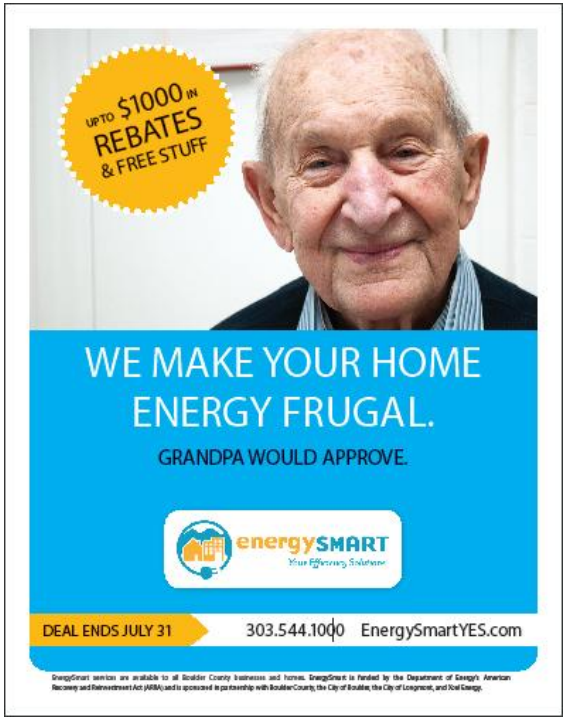
General strategies outlined in LBNL report,

"Driving Demand for Home Energy Improvements"

www.drivingdemand.lbl.gov

Tailored Strategies for MI households:

- Use Trusted Messengers
- Solve a Problem that Households Recognize
- Reduce the Cost of Upgrades
- Reduce Participant Risks



Program advertisement from Boulder County, CO

Reduce the cost of upgrades

- It may not be realistic to expect MI households to make $5,000 to $15,000 proactive efficiency investments.

- Alternative models:
  - Prescriptive Paths
  - Do-It-Yourself Improvements (DIY)
  - Start with the Basics

Yard sign from Bainbridge Island, WA

Start with the basics

E.g. Arizona Public Service/Salt River Project Home Performance with ENERGY STAR® program

- **Most participants pursuing basic upgrades.**
  ~4,000 upgrades in 2011, with average cost ~$3,000 and savings per home of ~10%.
- **Contractors develop comprehensive plan.**
  Goal is ongoing engagement and investment.

Will households make enough future improvements to achieve deep energy savings?

Reduce participant risks

MI households are generally more vulnerable to losses than their higher income peers.

Risk reduction strategies:

- Increase financial incentives
  - Some programs tier financial incentives based on household income.
- Flexible loan terms
  - Loan terms can be set and adjusted to ensure energy savings exceed loan payments.

Solutions?

→ Make EE more attractive

→ Increase access to capital (responsibly)

→Public policy MUST be part of the solution

Credit enhancements to reduce lender risk

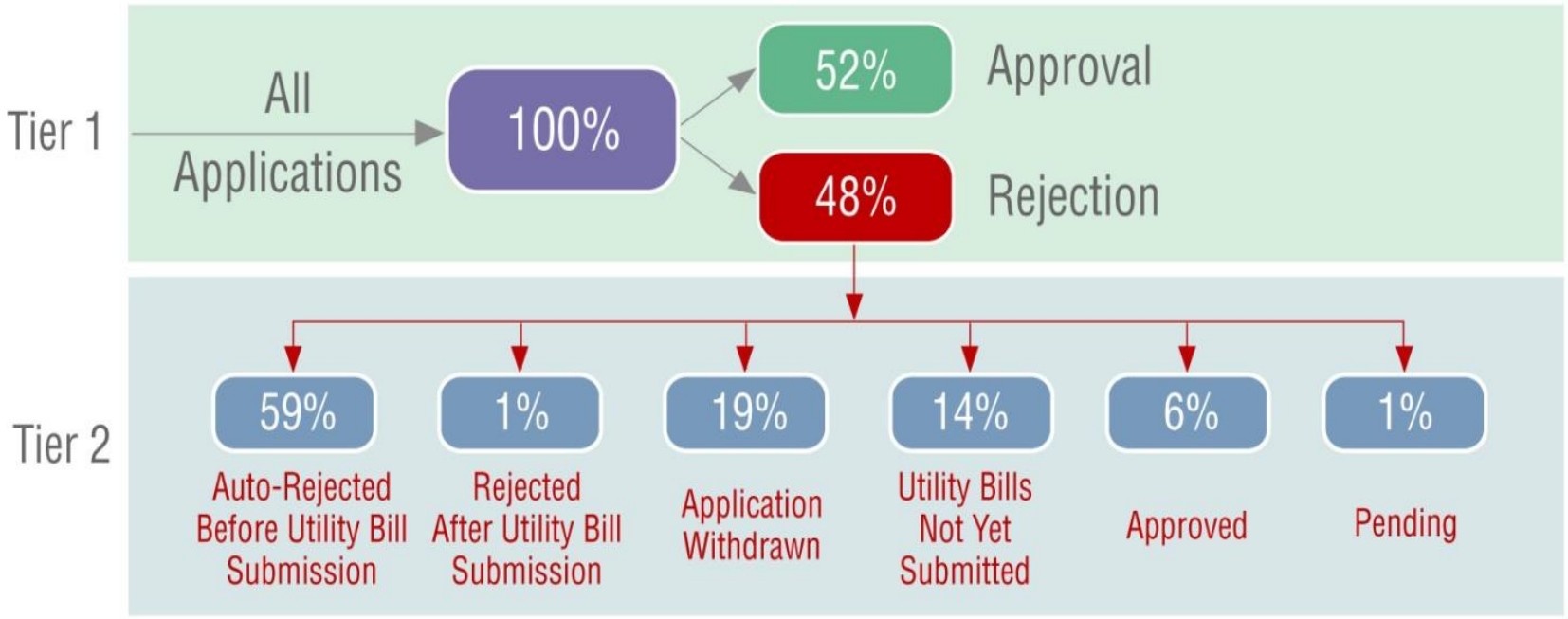
- Innovative energy efficiency financing programs are using credit enhancements to expand capital access.
  - Example: Milwaukee & Madison, WI-Summit Credit Union Partnership

FICO Score Range	% of Each Loss Covered By LLR	% of Each Loss Absorbed by Credit Union
690+	70%	30%
650-689	80%	20%
610-649	90%	10%
540-610	95%	5%

Alternative underwriting to increase access

Some programs are using alternative underwriting criteria (typically utility bill repayment history) to identify creditworthy borrowers who don't meet traditional lending standards.

Summary of GJGNY loan application process and data
November 2010 - October 30, 2011



Innovative financing tools

- **On-bill financing**
  - Many households have long histories of paying utility bills regularly. On-bill repayment may reduce loan delinquency and increase household willingness to finance energy improvements.
  - In some cases, nonpayment can trigger utility shut-off, an additional security against non-payment.
- **Paycheck-deducted financing**
  - Loans are repaid through regular, automatic deductions from an employee's paycheck.
- **Property Assessed Clean Energy (PACE)**
  - Special property assessment (tax lien)

—not currently available in the U.S.

Solutions?

→ Make EE more attractive

→ Increase access to capital (responsibly)

→Public policy must be part of the solution

More comprehensive policy needed

Robust public policies that bring additional focus and funding to bear on reducing MI household energy use are necessary to complement program design, outreach, and financing strategies.

Policy options include:

- Energy Savings Targets
- Cost Effectiveness Policies
- Codes and Standards
- Labeling, Disclosure and Upgrade Regulations

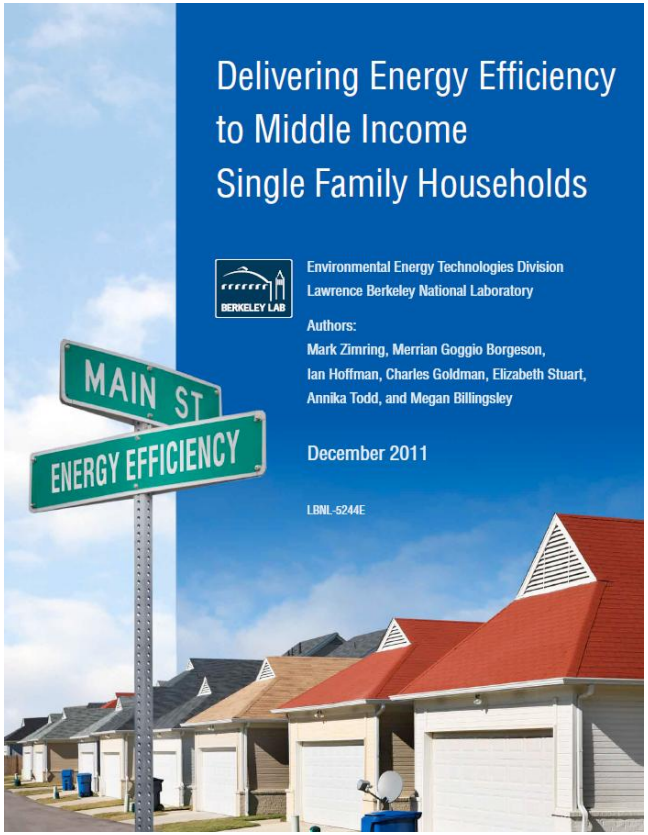
Summary

- Progress is being made in expanding the residential EE market as programs transition toward multi-measure improvements
- But, reaching middle income households will require tailored strategies to overcome challenges
- These strategies necessitate complementary policies to reach a scale relevant to public goals

Resources

For the full report, webcasts, policy briefs and other information, please visit:

http://MiddleIncome.lbl.gov



Mark Zimring

mzimring@lbl.gov

510-495-2088