



The Parker Ranch installation in Hawaii

Delivering Energy Efficiency to Middle Income Single Family Households

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Lawrence Berkeley National Laboratory

January 24, 2012

Please join us again:

Title: Driving Demand for Middle Income Energy Improvements & Addressing Housing Issues

Date: February 14, 2012

Time: 3:00-4:30 EST

Title: Financing Middle Income Energy Improvements

Date: March 6, 2012

Time: 3:00-4:30 EST

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

Date: April 4, 2012

Time: 3:00-4:30 EST

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

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December 2011



Presentation Overview



- **Research Question & Methods**
- **Middle Income Market Definition and Characteristics**
- **Driving Demand**
- **Building Stock Structural Issues**
- **Access to Capital**
- **The Role of Policy**

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 makers, 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/>

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Energy Costs

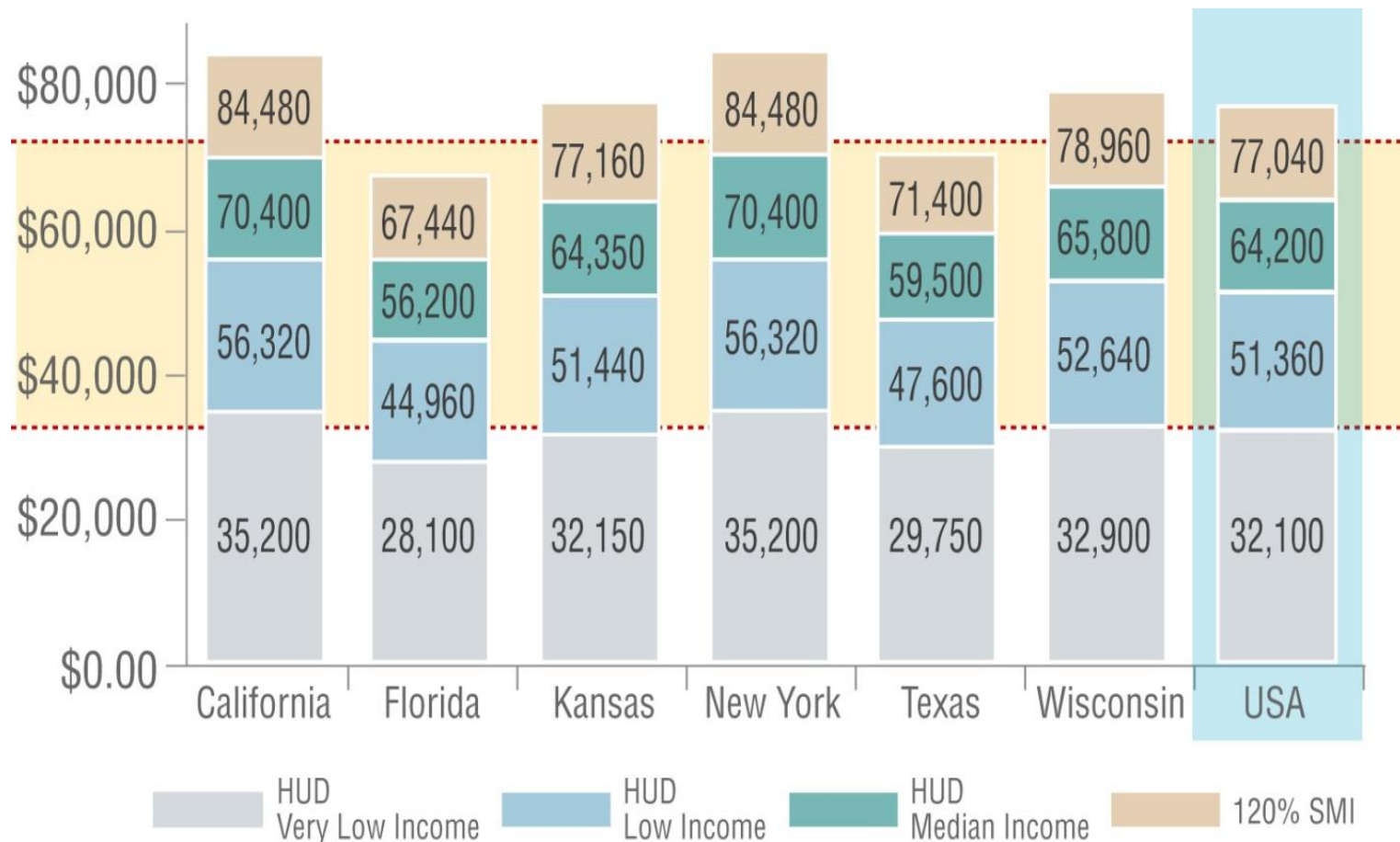
- Middle income households will spend about \$80 billion on residential energy in 2011.
- Total home energy cost remains a small fraction of gross income – about 4 percent – but is quite significant compared to other household spending.
- For a median-income household, energy spending is equivalent to:
 - >55% percent of spending on food at home
 - 65% of healthcare spending
 - Nearly 1.4 times spending on clothing



Defining Middle Income (MI) Households



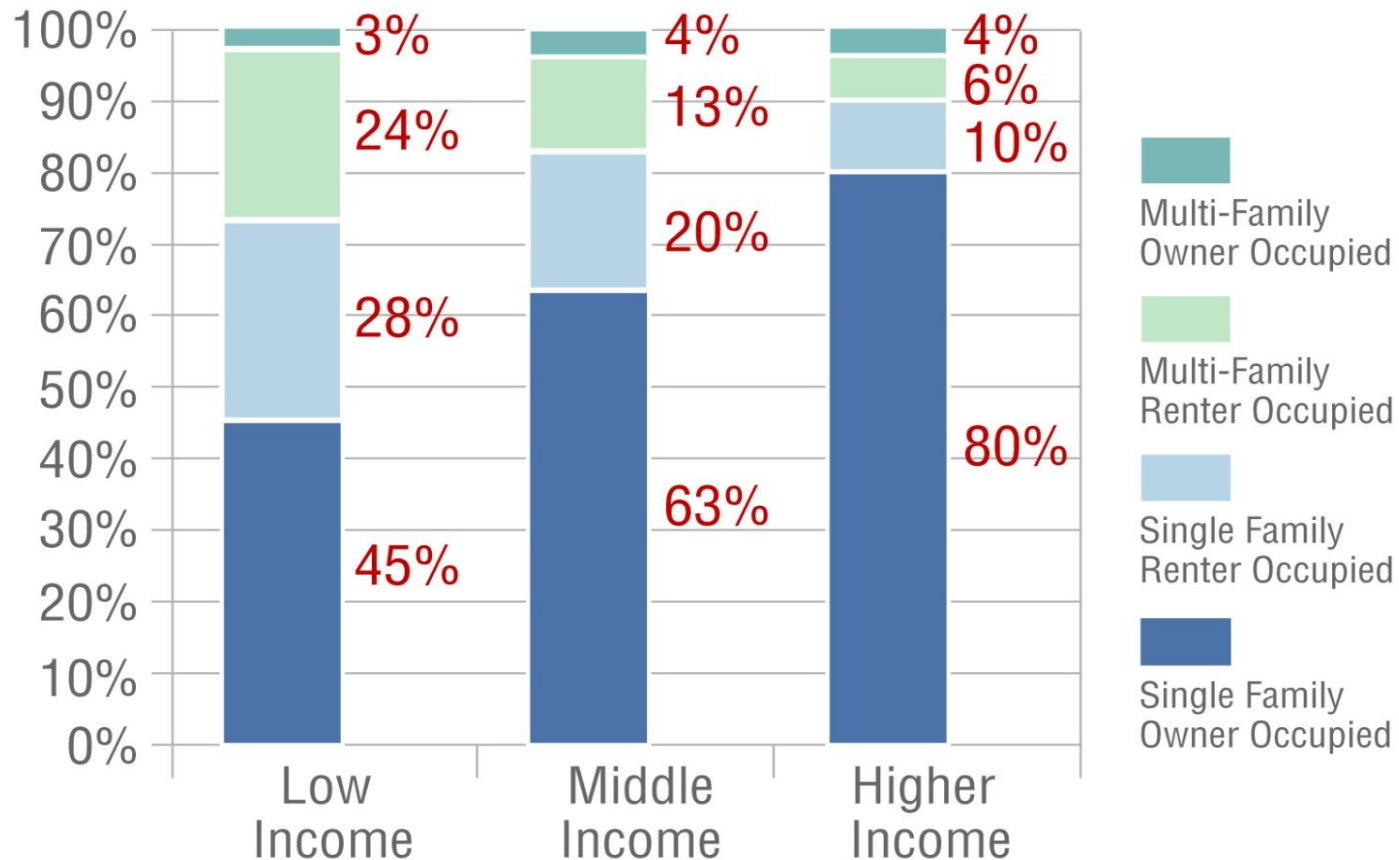
The middle third of U.S. households by income earn \$32,500 to \$72,500.



Targeting Middle Income Households



Most middle income (MI) households own single family homes.



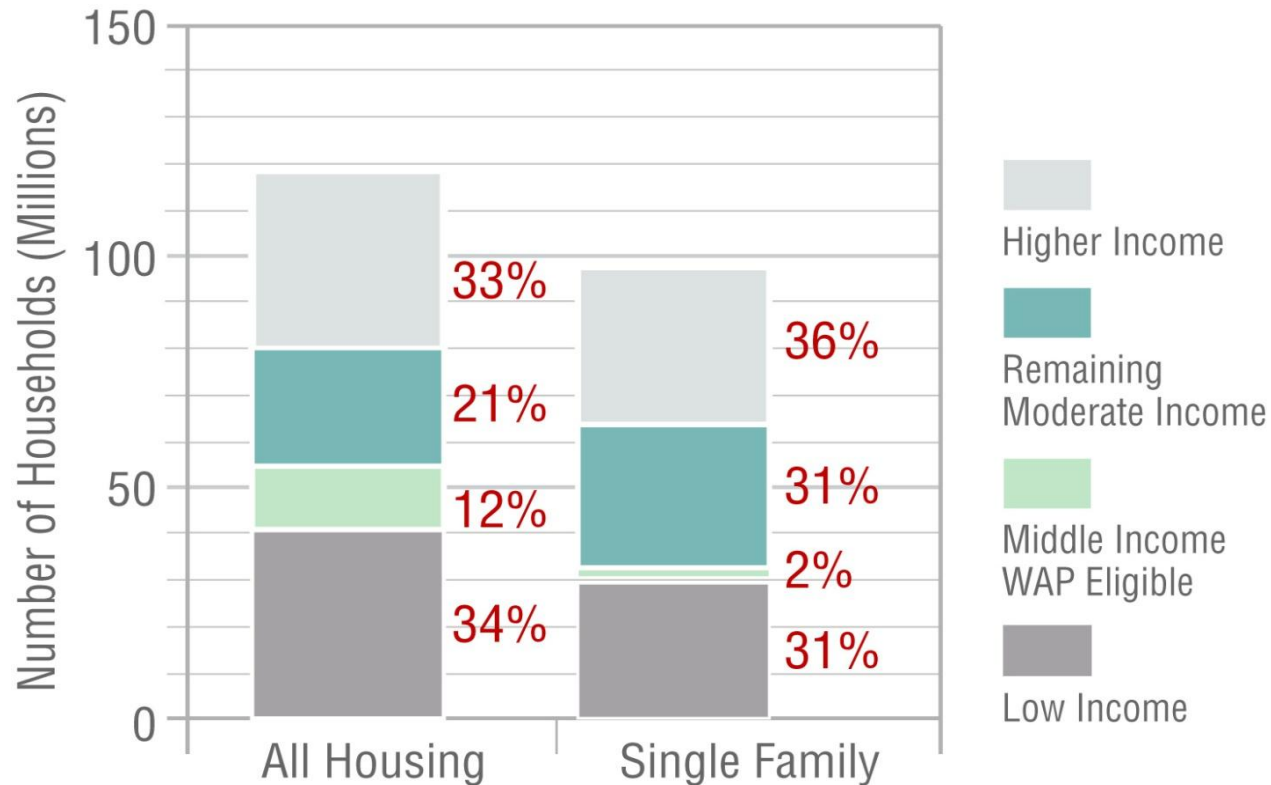
* Single family homes include mobile homes and 1-4 unit dwellings

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).* **Just 6% of MI single family households qualify for WAP.**



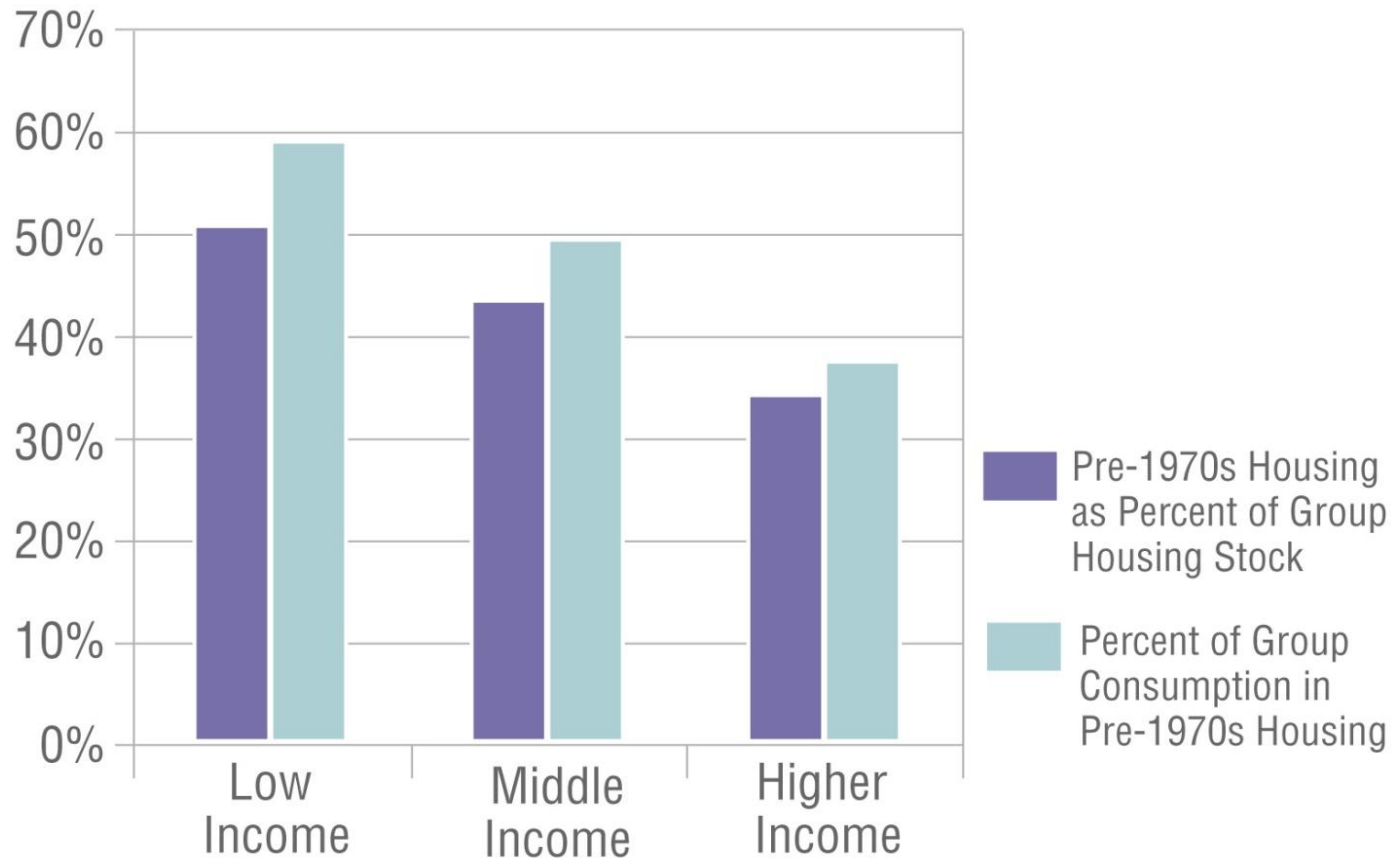
* The Department of Energy's Weatherization Assistance Program offers low income households free basic weatherization improvements.

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.



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.



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Driving MI Demand



- 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

Opportunities for Reaching MI Households

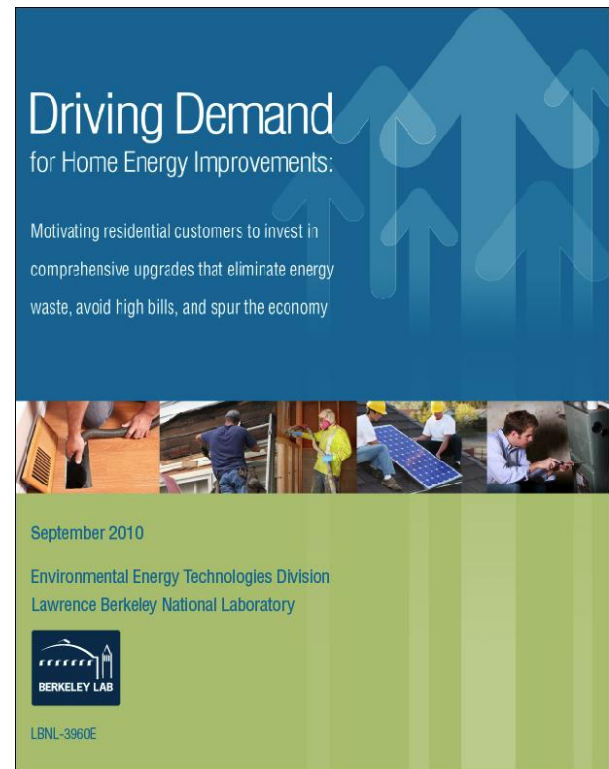


General strategies outlined in LBNL report,
“Driving Demand for Home Energy Improvements”

www.drivingdemand.lbl.gov

Tailored Strategies for MI households:

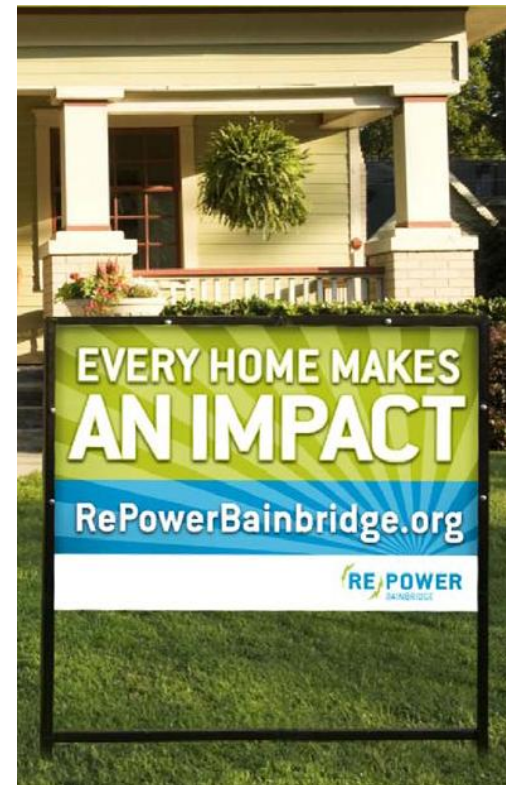
- Use Trusted Messengers
- Solve a Problem that Households Recognize
- Reduce the Cost of Upgrades
- Reduce Participant Risks



Driving Demand: 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:
 - Start with the Basics
 - Prescriptive Paths
 - Do-It-Yourself Improvements (DIY)



Yard sign from Bainbridge Island, WA

Start with the Basics



- Arizona Public Service/Salt River Project Home Performance with ENERGY STAR® program
- Most participants pursuing basic improvements. ~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.



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

Driving Demand: 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.
 - Performance Guarantees
 - Programs should consider piloting performance guarantees to assess their costs and impacts on demand and household behavior.



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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.
- Addressing these issues as part of energy efficiency program delivery can attract more participants and address important structural and safety risks.
 - Allow non-energy measures in energy efficiency financing
 - Leverage weatherization contractors
 - Coordinate funding from multiple sources



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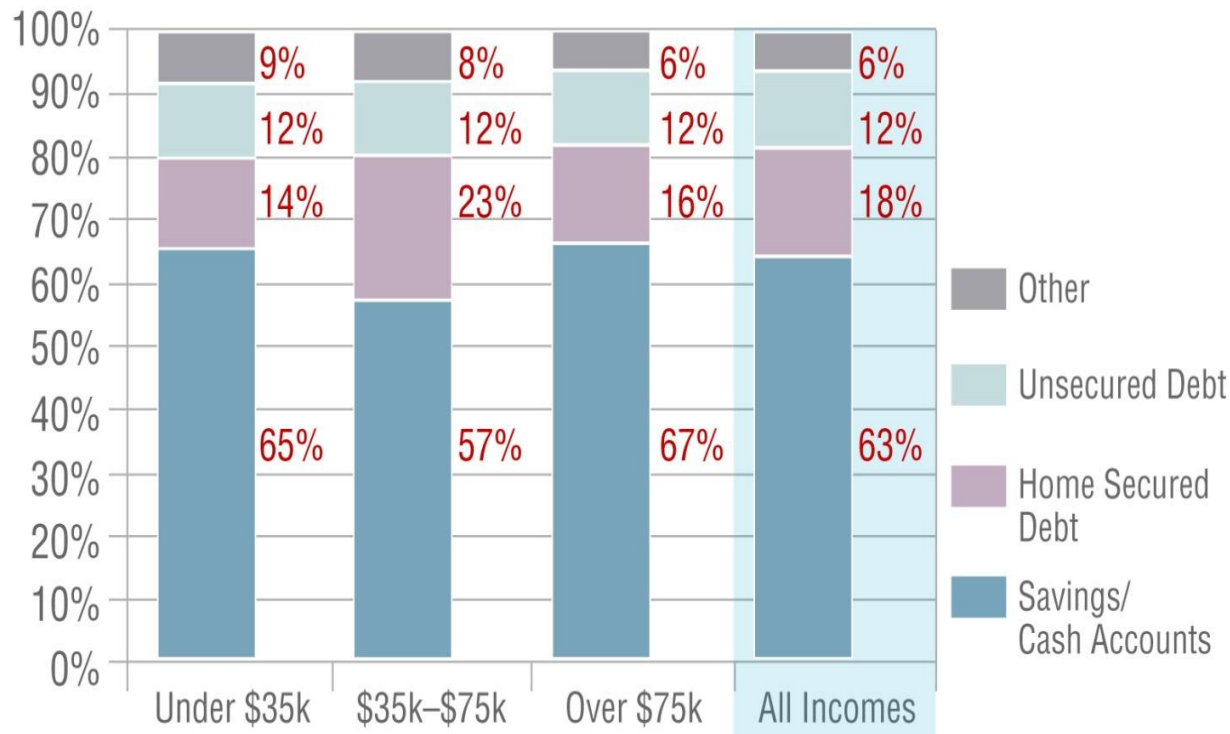
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Financing to Address Upfront Costs



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.

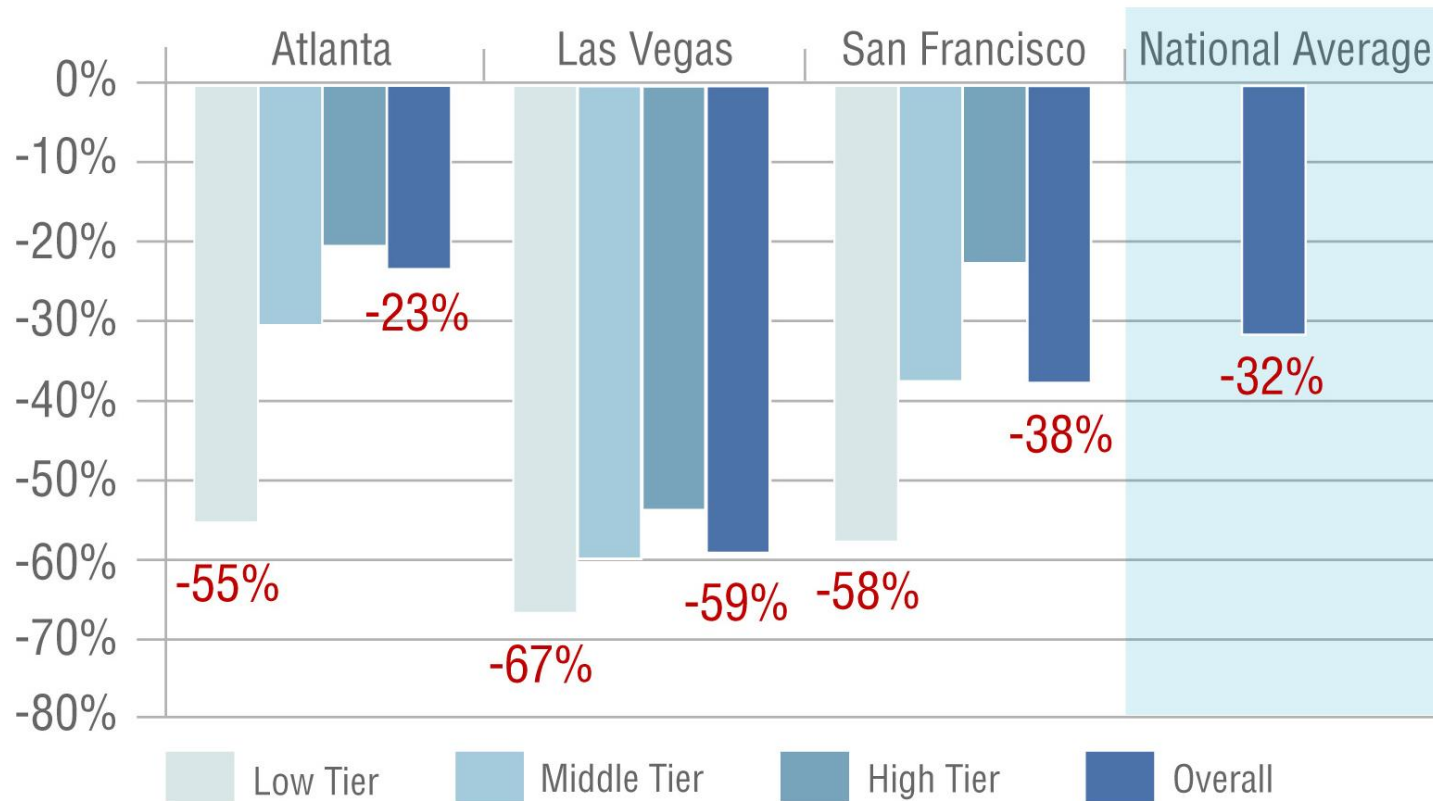
Home Improvement Financing Patterns by Income in 2001



Home Values Have Declined Dramatically



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.



Qualifying for Credit



At the same time that access to home-secured financing has declined, the largest energy efficiency loan programs are rejecting 20-50% of applicants.

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

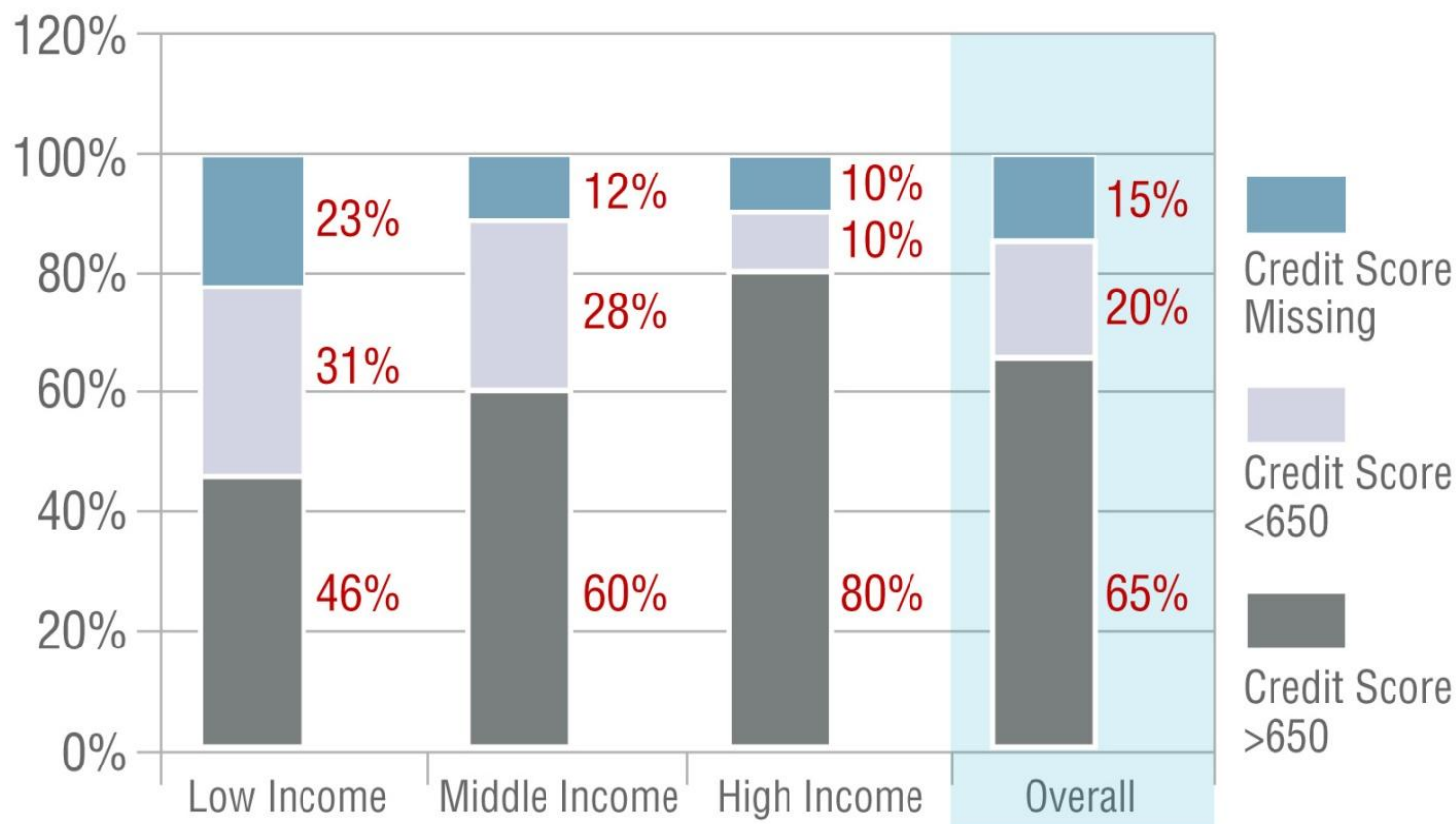
Keystone HELP loan application, approval, funding and loan size rates (by income) – January 2010-August 2011

| 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 |

Qualifying for Credit



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.



Increasing Access to Capital



Middle income households need new ways of accessing affordable credit. But underwriting criteria exist for a reason—to ensure that those who get access to financing can and will repay it.

Credit Score and Corresponding Delinquency Projections

| FICO Score Range | Delinquency Projection (% Likelihood) |
|------------------|---------------------------------------|
| 300-499 | 87 |
| 500-549 | 71 |
| 550-599 | 51 |
| 600-649 | 31 |
| 650-699 | 15 |
| 700-749 | 5 |
| 750-799 | 2 |
| 800-850 | 1 |

Strategies for Increasing Capital Access



- Strategies that may increase MI household access to capital include:
 - Credit Enhancements
 - Alternative Underwriting
 - Innovative Financing Tools



Credit Enhancements



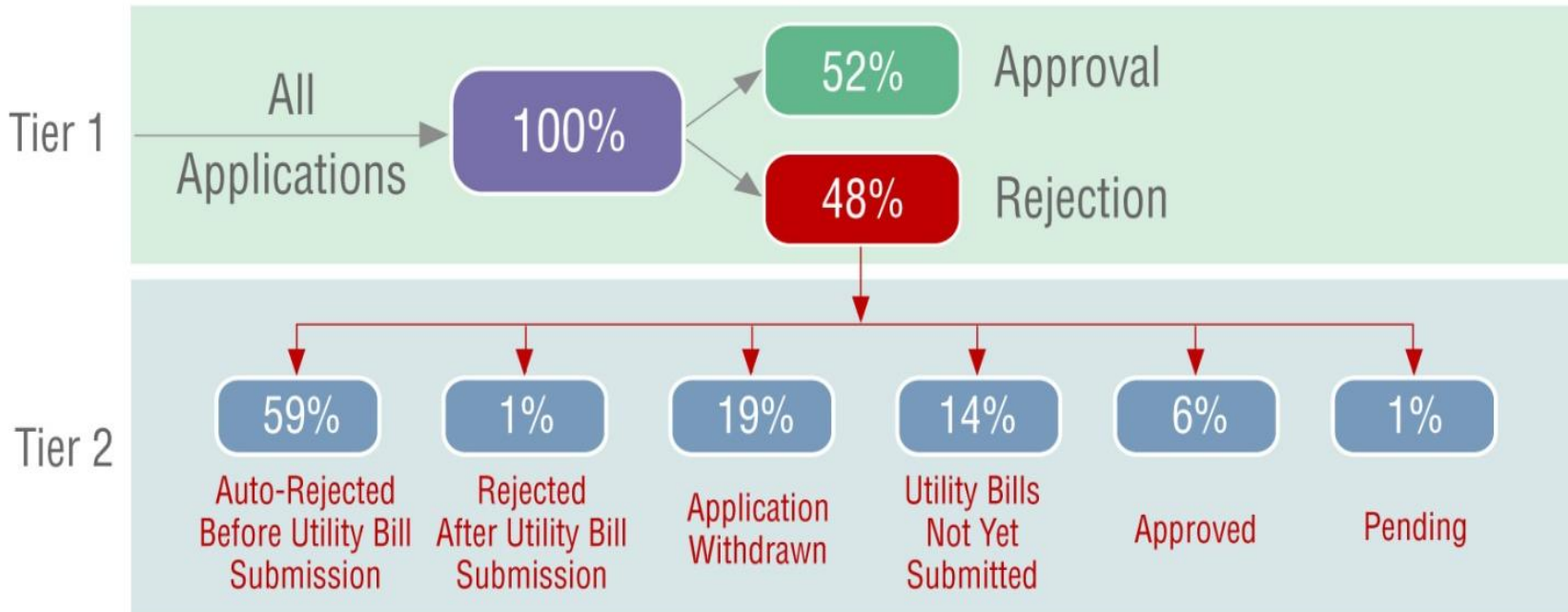
- Innovative energy efficiency financing programs are using credit enhancements to expand capital access.
 - Example: Milwaukee & Madison, WI-Summit Credit Union Partnership

| 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

- 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.
- **Loans paid off at property transfer (Deferred Loans)**
 - Some MI households (e.g. fixed income) do not have the capacity to make consistent loan payments. A common practice among housing agencies is to attach a lien to the property that must be paid off when the property is sold or otherwise transferred.
- **Paycheck-Deducted Financing**
 - Loans are repaid through regular, automatic deductions from an employee's paycheck.

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The Role of Policy



- Support, complement and amplify strategies for driving demand and financing energy improvements.
 - These same policies can also expand available resources and opportunities for reducing energy use in other market segments



Complementary Policies



- **Policy options include:**
 - Energy Savings Targets
 - Cost Effectiveness Policies
 - Codes and Standards
 - Labeling, Disclosure and Upgrade Regulations



Energy Savings Targets



| Key Policy Drivers for Energy Efficiency Savings | States or Other Entities Where Applicable |
|---|---|
| Statutory requirement that utilities acquire all cost-effective energy efficiency | CA, CT, MA, RI, WA |
| EEPS/EERS | AR, AZ, CA, CO, HI, IL, IN, MA, MD, MI, MN, MI, NJ (proposed), NM, NY, OH, PA, TX, VA (provisional), WI |
| Energy efficiency eligibility under state RPS | DC, HI, NC, NV |
| Recently-approved Integrated Resource Plan | ID, MT, UT, SC, TVA (TN, AL, MS, KY, GA, NC, VA) |
| Recently-approved Demand Side Management plan or multi-year budget | FL, GA, IA, ME, NJ, OR, VT, WV |

Cost Effectiveness Policies



- The way in which cost effectiveness is measured heavily impacts which sectors and improvements programs target. To expand MI offerings:
 - Measure cost effectiveness on a portfolio basis
 - Include both energy benefits and non-energy benefits
 - Exempt non-EE project cost components from cost effectiveness testing

Codes and Standards

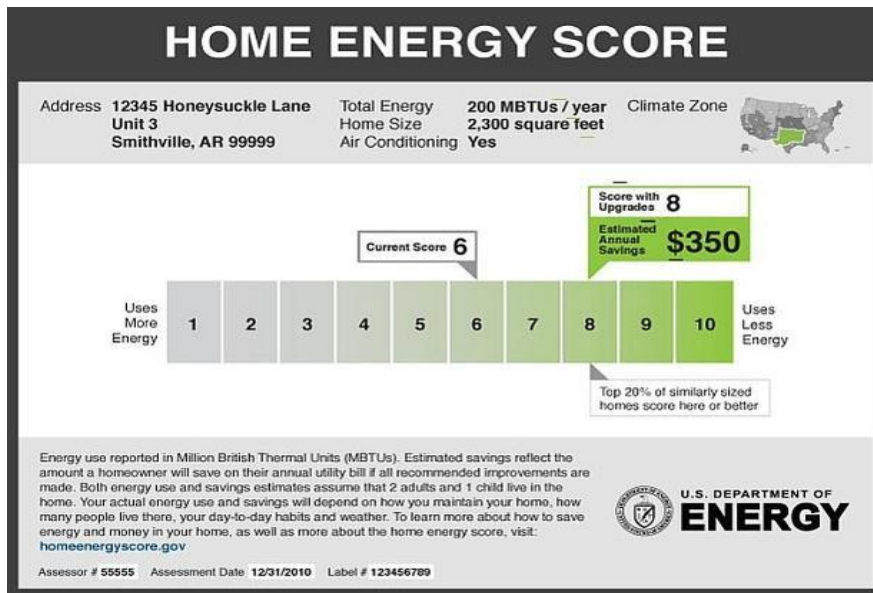
- Codes and standards can achieve energy savings that programs don't or can't tap.
 - Places where programs don't exist or implementation is not cost effective
 - Plug/vampire loads – fastest growing home energy use
 - End uses with little or no consumer choice (e.g. set-top boxes leased by cable and satellite companies)



Building Energy Labeling, Disclosures and Regulations



- Labeling & disclosure. Make the full costs of operating a home more transparent to renters, homebuyers and lenders.
- Minimum energy performance regulations can augment voluntary programs by targeting key transaction points:
 - Property sale or transfer
 - Property rental
 - Building permit for remodeling



Summary



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

Resources



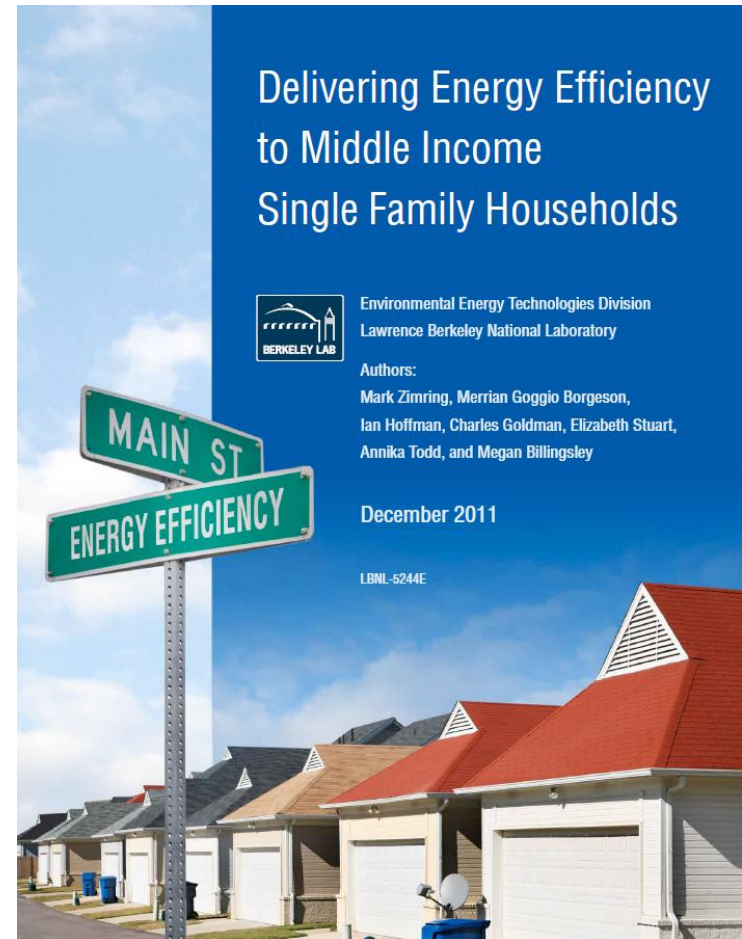
Questions?

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

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