



## Upgrading America's Homes Comprehensive Residential Energy Upgrade Financing

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# Overview

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- Central air conditioning, heating (HVAC) and replacement windows are some of the largest cost and largest energy use items in homes. HVAC systems are upgraded approximately every 20 years, windows are replaced approximately every 40 years.
- The right financial incentive can motivate homeowners to accelerate equipment replacement and to upgrade from lowest first-cost, inefficient options to slightly more expensive, high efficiency options. These incentives can also drive homeowners to undertake comprehensive, aggressive energy efficiency upgrades and to purchase clean on-site generation, such as solar PV.
- This proposed national program builds on the Energy Star product rating program and links it to low-interest financing, a combination that has worked in dozens of state, municipal and utility programs over the last decade, but at small scale.
- This model is proven and, if adapted and scaled nationally as described below, would provide leveraged, very cost effective financing to drive over 1 million residential efficiency upgrades a year within 2-3 years.

# Comments about this program

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- **Timing:** Triggering event for using this financing product will typically be the need to replace central heating, air conditioning and/or windows
- **Scale:** There are approximately 80 million single family homes in the US. Heating and air conditioning systems last about 20 years so over 10,000 homeowners replace heating, air conditioning and/or windows every day.
- **Quality:** This program is intended to provide a national financing option for energy upgrades for family home owner. It provides for sound technical advice, certified contractors, contractor management, and 100% financing.
- **Agency Sponsors:** Program can be sponsored by city, utility company or state energy efficiency or state housing financing agency, and can operate independent of utilities.

# Examples

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## Examples of Working Residential Energy Loan Programs\*

- Southern California Gas, San Diego Gas and Electric
  - NYSERDA Residential Loan Program
  - Wisconsin Energy Conservation Cooperative Loan Program
  - Pennsylvania's Keystone Home Energy Loan Program
  - Austin Texas Energy Loan program
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- Over 150,000 installations financed since 1995
  - But rate of financing has slowed to 5000 per year. This reflects lack of standardization, fragmented market
  - Provides basis to scale a very cost effective national solution to the enduring problem of inadequate funding for residential energy efficiency and renewables

\* See EPA Energy Star: Financing Guidebook for Energy Efficiency Program Sponsors:  
[http://www.energystar.gov/ia/home\\_improvement/downloads/FinancingGuidebook.pdf](http://www.energystar.gov/ia/home_improvement/downloads/FinancingGuidebook.pdf)

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- **Market Segment:** Residential Single Family
- **Product:** Unsecured loan for Energy-Related Home Improvement Financing
- **Lender:** Specialized Energy Lenders (Viewtech, Energy Finance Solutions, AFC Finance), new financial entrants
- **Investor:** Investors in Housing Finance (e.g., Fannie Mae and or investors in Asset Backed Securities)
- **Program Sponsor:** Promotes program to homeowners (States, Municipalities or utilities)
- **Loan Terms:** Unsecured, 6.9% fixed-rate, 12 year term, maximum loan amount \$25k. Solar requires minimum \$5000 efficiency investment.
- **Eligible Borrowers:** Homeowners, typical minimum credit rating of 660
- **Eligible Properties:** Owner occupied single family residences
- **Eligible Improvements:** Energy Star-rated, energy efficient/clean energy and water technologies (heating, ac, heat pumps, windows, insulation, weatherization, lighting, controls, solar, geo-thermal, wind, etc.)

# HouseholdEconomics

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- Typical installation = \$10,000 (e.g., heating, ac replacement) paying a 12% *premium payment* for high efficiency = \$1,200
- Typical energy savings of 20% - 40%
- Typical dollars savings = \$400 per year (a 3 year payback on the \$1,200 premium for high efficiency)
- Cost to “buy-down” the interest rate from target rate (11.9%) to program rate (6.9%) = \$1,200 per loan
- Combined interest rate subsidy and borrower's *premium payment* = \$2,400 (\$1,200 + \$1,200) a 6 year payback

# Program Economics

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## Ramp-up:

- Months 1-6: 5,000 loans/month
- Months 7-12: 10,000 loans/month
- Months 13 -18: 30,000 loans/month
- Months 19-24: 50,000 loans/month
- Months 25+: 100,000 loans/month

Program cost in first two years = \$720 million

Annual run-rate by year 3 = \$1.5 billion

*(includes 5% to cover program management costs)*

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- ❖ Cost of efficiency savings is \$0.04 to \$0.05 per kWh. This is less than half the average cost of retail power and has large additional economic, employment, health and environmental benefits compared to additional power generation
- ❖ 20% - 40% average energy consumption reduction per home
- ❖ Cost Impact calculations (based on New York and Wisconsin state energy efficiency programs):
  - At annual run rate (\$1.5 billion) program saves:
    - 848 million therms of natural gas
    - 2.56 million MWh electricity
    - Over 6 million tons of CO<sub>2</sub>:
      - 4,960k tons CO<sub>2</sub> (@ 117 lbs/mmBtu of natural gas)
      - 1,280k tons CO<sub>2</sub> (@ 1004 lbs/mWh of electricity)
- ❖ The Program will incur costs of \$1,200 to incent Homeowner's payment of \$10,000 in very efficient equipment (leverage of over 8.5 to 1)



# Win-win for Stakeholders: Homeowners, Sponsors and Contractors

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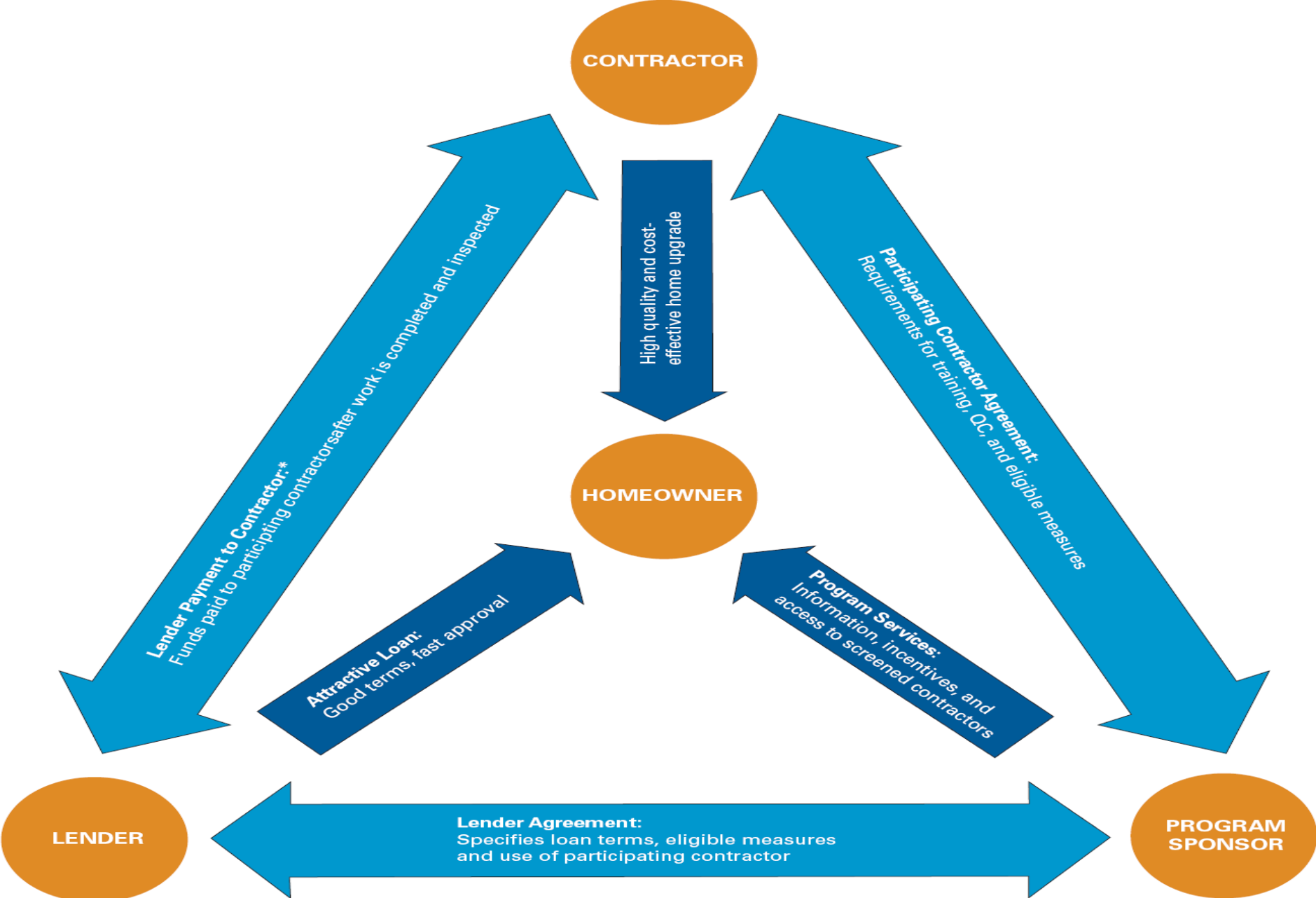
- ❖ Homeowner gets technical info from Energy Star and Sponsor to make good buying decisions, low-cost convenient financing and using only to Sponsor certified contractors.
- ❖ Sponsors (state, municipality, utility) achieve energy efficiency goals, comprehensive measure installations, high volumes and deep reductions in energy use.
- ❖ Contractors benefit from sponsor's (states', municipalities', utilities') promotion, a low cost, simple financing solution (not currently available) and credibility from the association with the Sponsor
- ❖ Manufacturers get volume sales for their high-efficiency equipment and excellent-quality installations
- ❖ Investors get higher-credit quality consumers (homeowners)

# Overview

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- ❖ Federal funding to buy down rates
- ❖ Offered through state, municipal and utility demand-side programs
- ❖ Performance based on Energy Star standards
- ❖ Upgrades include water efficiency measures
- ❖ Opportunity for greater cost reduction and leverage
- ❖ Program would help achieve national objectives for clean energy investment, competitiveness, energy independence and pollution reduction
- ❖ At state and utility level, program would help achieve goals related to energy efficiency, renewables, zero net energy buildings and carbon reduction



*From EPA Energy Star Financing Guidebook, Dec 2007*



# The Process

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1. Sponsor (states, municipalities, utilities) promotes program (see p 10)
2. Certified contractors provide Homeowner with proposals either directly or through sponsor (e.g., state energy office)
3. Homeowner selects Contractor and improvements
4. Contractor installs and commissions improvements
5. Homeowner signs financing agreement (e.g., \$10,000)
6. Lender sells financing agreement to Investor, Investor pays Lender financing agreement amount (e.g. \$10,000) plus \$250 origination fee (based on existing programs) and lender pays Contractor (e.g., \$10,000)
7. Investor receives payment (e.g., \$1,200) from Sponsor to compensate for below market interest rate (6.9% vs. 11.9%) on financing agreement

## Program Incentive Levels

- Rates linked to level of energy savings and Energy Star purchases (see eligible measures)
  
- Energy Reductions .....and Reduced Interest Rates:
  - ❑ Less than 30% Interest rate: 6.9%
  - ❑ 30% + Interest rate: 5.9%
  - ❑ 40% + Interest rate: 4.9%
  - ❑ 50% + Interest rate: 3.9%
  
- For each installation, prescriptive energy savings calculations based on rated equipment performance. Standard template analysis by contractor and lender and certified by lender.
- Subsequent statistically significant random M&V sampling of project savings (utilities now use this approach)
- Comprehensive retrofits reduce consumers exposure to volatile price of energy, increase comfort and system reliability
- Energy Star benchmarks will be reviewed regularly and updated to ensure performance in upper 15% in respective technology category