

# Strategies for Deep Building Retrofit Savings


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## The Residential Building Retrofit Challenge:

- To achieve (1) climate goals and (2) economic benefits of energy efficiency requires **massive, deep retrofit** of our residential building stock.
- Magnitude of savings required (and cheaper than other alternatives) is likely to be over 1/3 savings in over 2/3 of existing homes.
- Voluntary programs marketing retrofit benefits and providing modest incentives (most of what we do now) is too slow...and time matters.
- The investment is going to be costly, but is there a combination of public cost-share and building-owner financing that might work?

## A Few Specific Challenges:

- Investments in massive, deep residential retrofits (25%+ savings) have longer paybacks than most consumers are interested in.
  - Most existing energy loan products have terms too short to show positive cash flow for deep savings.
  - Outside of low-income programs, the more that households need financing assistance, the less likely they are to qualify for it.
  - 70% of homes in the U.S. use at least two fuels, mostly from different suppliers.
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## A Few Strategies Put Forward:

- Buy-down retrofit cost with public funds
- On-bill financing (tariffed installation payment)
- Municipal financing
- Performance contracting
- Energy Improvement Mortgages
- Clean Energy Tax Assessment Districts
- Home equity energy loans
- Deep energy savings mortgage refinancing
- Time-of-sale energy labeling or requirements
- Guarantee funds to support mechanisms above
- Bulk-procured deep-savings direct installation



# Clean Energy Municipal Financing

Merrian Fuller, UC Berkeley

ACEEE Market Transformation ~ March 30, 2009

# Barriers to Energy Efficiency

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- Transaction costs
- Lack Split incentives
- High of information
- Uncertainty about the energy savings
- **upfront cost**
- Others...



# 150+ EE Financing Programs

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## Conventional

- AFC's Keystone Home Energy Loan
- City of Cambridge (new)
- Efficiency Vermont
- California EE Loan Fund (terminated)
- MN Center for Energy and Environment
- NYSERDA's Energy Smart Loan Fund
- NYSERDA's HPwES Loan Program
- Nebraska Energy Office
- Sacramento Municipal Utility District
- Vermont Gas Systems
- Viewtech Financial Services

## On-Bill Financing

- BC Hydro (terminated)
- First Electric Cooperative
- Manitoba Hydro
- NW Natural Gas (terminated)

## Tariffed Installation Program (TIP) w/ On-Bill Repayment

- ❑ Maui Electric Company
- ❑ Midwest Energy
- ❑ NH Electric Coop (terminated)

## Clean Energy Municipal Financing

- ❑ City of Berkeley (new)

# Issues Identified

1. Low Participation Rates
2. Limited Support for Comprehensive Retrofits
3. Limited Applicability to Households Most in Need

Research Sponsors:

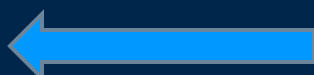
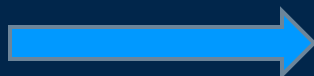


# How CEMF Works

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**\$\$ Upfront**



**\$\$ Repaid  
on tax bill**



- Creates special tax or assessment district
- Develop an approval process
- Provides upfront capital (bonds or other)

- Identifies work & chooses contractor
- Applies for financing
- Repays financing over ~20 years

# Benefits of CEMF

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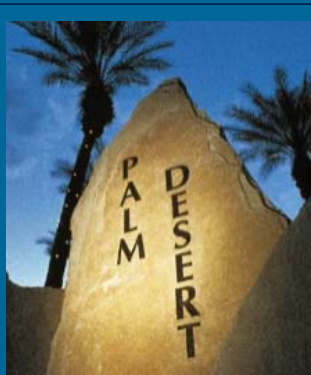
## Issues (Potentially) Addressed

- Allows comprehensive energy savings
- Available to households most in need (somewhat)
- Low participation

## Additional Benefits

- Lower interest rate and transaction costs
- New, trusted information source
- Transferable with ownership

# Palm Desert, CA



- **Law:** AB 811 (assessment district)
- **\$\$:** Used general revenue funds to start, then Redevelopment Authority bonds, now looking for additional funds
- **Terms:** 7% up to 20 years
- **Status:** \$7.5 million claimed since Nov 2008 launch; of 206 applications over half EE (AC upgrades, pool pumps, insulation) but 70% of funds to solar, all but 3 are residential projects

# Babylon, NY



- **Law:** Redefined “municipal solid waste”
- **\$\$:** Used existing municipal solid waste fund as revolving loan pool
- **Terms:** 3% term varies based on expected savings
- **Status:** 84 homes have claimed over \$500K in first 5 months for air sealing, insulation, and replacing space heating and hot water systems; est. average savings of 28% per home

# Berkeley, CA



- **Law:** Mello-Roos (special tax district)
- **\$\$:** Issuing “baby muni bonds” purchased by a financial partner who can package and resell
- **Terms:** 7.75% for 20 years (varies based on 10-year Treasury plus 3.25%)
- **Status:** \$1.5 claimed in 9 minutes for the solar-only pilot round, basic energy improvements required

# Questions?

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**Merrian Fuller**

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## Resources

Articles, How To Guide, Seminar: [http://  
RAEL.berkeley.edu/financing](http://RAEL.berkeley.edu/financing)

Berkeley: [www.berkeleyfirst.renewfund.com](http://www.berkeleyfirst.renewfund.com)

Palm Desert: [www.cityofpalmdesert.org](http://www.cityofpalmdesert.org)

Babylon: <http://ligreenhomes.com>

## Discussion Questions:

- What strategies or combination of strategies are the most promising to achieve massive, deep energy residential energy retrofits?
- What mechanisms can assure comprehensive retrofit when homes use multiple fuels, including unregulated fuels?
- How can mechanisms assure deep savings retrofits?
- To what extent can we rely on paying for retrofits out of energy cost savings?
- To what extent and through what mechanisms can private capital be utilized?
- What is the role of the Federal government in overcoming the barriers to massive, deep retrofit?