

Housing California Conference
April 27, 2011

Green Finance

ARRA, Energy Efficiency and Beyond:
Retrofit Funding Case Studies, Today and Post-ARRA

Compiled and Moderated by Tara Siegel, LIIF, tsiegel@liifund.org

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ENERGY SAVINGS, WHAT SAVINGS?

Audit Findings from 32 Buildings:

- From the Bay Area (19 buildings) and LA (13 buildings)
- Master metered (17) and Individually metered (15)
- Low rise (10) and High rise (22)
- Total 2,227 units

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AUDIT FINDINGS

Reduction in energy costs over existing conditions:

- Utility savings* in master metered buildings ranged from a low of 10% to a high of 47%; **average = 26%**
- Savings in buildings with a combination of master and individually metered utilities ranged from 19% to 45%; **average = 28%**
- Per unit savings averaged at \$270 per unit per year

* Gas, electric & water

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WHERE DID THE SAVINGS COME FROM?

Efficiency Measures that resulted in the highest Savings to Investment Ratio:

- Domestic Hot Water
- Interior Lighting
- Thermostats
- Exit Lights
- Low Flow Toilets
- Heating boiler
- Air Handling Units

Retrofit cost per unit – ranged from < \$1,000 / unit to a high of \$11,000 / unit; **average = \$5,000 / unit**

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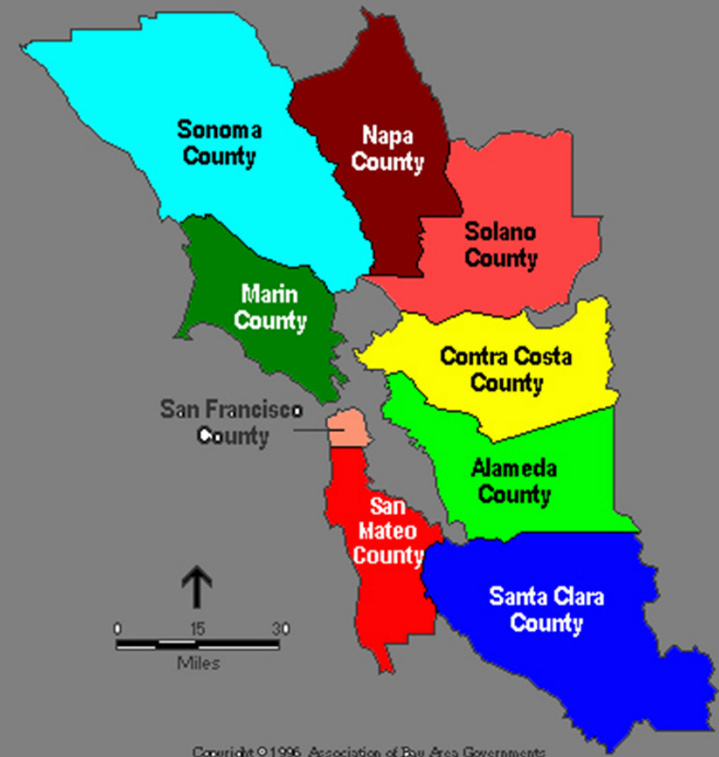
CAVEATS TO KEEP IN MIND

- Some of the buildings already completed extensive lighting and water conservation upgrades
- Ages of buildings vary – oldest: early 1900's; newest mid-1990's
- Occupancies vary between the buildings: seniors, formerly homeless, and families

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The Bay Area Multifamily Fund (BAM Fund)

- An innovative effort to improve energy and water efficiency in older affordable multifamily buildings
- Provides free energy audit, technical support, and favorably termed debt.
- Leverages other resources
- Located in nine county Bay Area



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GOALS of the BAM Fund

- Improve property cash flow
- Improve health of buildings and residents
- Reduce greenhouse gas emissions
- Link to green jobs programs
- *Enable retrofits to occur more quickly than a full rehab*



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One more GOAL of the BAM Fund

Prove the concept that energy savings can be projected with accuracy and monetized to drive debt that can be raised from the capital market.



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BAM Fund Loan Terms

- ✓ Interest Rate 5%
- ✓ Loan Term 10 years
- ✓ Debt Coverage Ratio 1.15 – 1.25
- ✓ Security/Collateral unsecured; flexible guaranty
- ✓ Repayment Source amortized monthly payments

Loans repaid with savings achieved as a result of the energy and water efficiency improvements

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Projected Energy Savings and Debt Service Calculations

EXAMPLE #1: Oakland, 98 units of family housing Historic high-rise building

COST OF IMPROVEMENTS: \$472,450 (\$4,821/unit)
ENERGY SAVINGS: \$21,930/year
DEBT LOAD: \$149,825

Projected Energy Savings Over
Current Use: 27% (includes water)



Exhaust Fan Testing

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Proposed Financing Scenario

DEBT	\$ 149,825
Weatherization	\$ 189,023
CA Solar Thermal Rebate Program	\$ 27,000
City Housing Funds	<u>\$ 106,602</u>
	\$ 472,450

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Example #1 Project Budget Scenario

Boiler/Motors	47,597
Service Doors	7,109
Wall Insulation	78,255
Windows/Doors	19,388
Lighting controls	1,087
DHW boiler	13,213
DHW tank	18,448
Solar thermal	98,310
Exit lights	4,935
Common area toilets	823
Dual flush converters (units)	5,758
Roof insulation	29,906
Roof replacement	104,671
Contingency (10%)	42,950
TOTAL	472,450

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GREEN RETROFIT INITIATIVE

An initiative sponsored by the Mayor's Office of Housing to improve energy and water efficiency and address associated repair needs of San Francisco's affordable housing stock

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KEY PRINCIPLES

- Exploit our existing affordable housing infrastructure to take best advantage of energy and water efficiency funding;
- Use a “whole-building” approach to evaluate building needs in a holistic and integrated way;
- Establish scopes of work based on building performance rather than from a prescriptive list;
- Maximize leveraging to extend limited funding.

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FUNDING

Weatherization Assistance Program (WAP) – ARRA
\$2.65 million

State Energy Program (SEP)
Comprehensive Residential Building Retrofit – ARRA
\$2.93 million

Potential Leveraged Sources:
EECBG, Utility Rebates, Lead Remediation, CDBG,
property reserves

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PROCESS

- Initial Assessment
- Preliminary Selection
- Energy Audit
- Scoping / Budgeting (Sources and Uses)
- Bidding
- Final Approval
- Construction / Monitoring
- Project close-out / Client Education

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PROGRAM SUMMARY

- 25 Applications received; approx. 1500 units
- 18 Applications approved, 2 rejected, 5 under review
- 12 audits completed
- 6 buildings under construction May 2011
- GRI ends March 2012

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USES

Measures	From Audit	SIR	Application	Contractor
DHW Generation	\$19,975	2.23	\$27,599	\$34,000
Boiler Replacement	\$26,649	1.13	\$36,820	\$40,000
Lighting	\$2,056	1.09	\$2,841	\$4,390
Apartment Thermostats	\$29,563	.60	\$40,797	\$18,480
Occupancy Sensors	\$2,174	.39	\$3,004	\$856
Emergency Lights	\$5,111	.38	\$7,062	\$4,582
Condensing Furnaces	\$11,280	.32	\$15,585	\$13,000
Apartment Lighting	\$740	.13	\$1,022	\$20,720
Radiators				\$69,048
Painting				\$28,300
Total (w/OH&P)	\$97,548		\$107,131	\$283,181

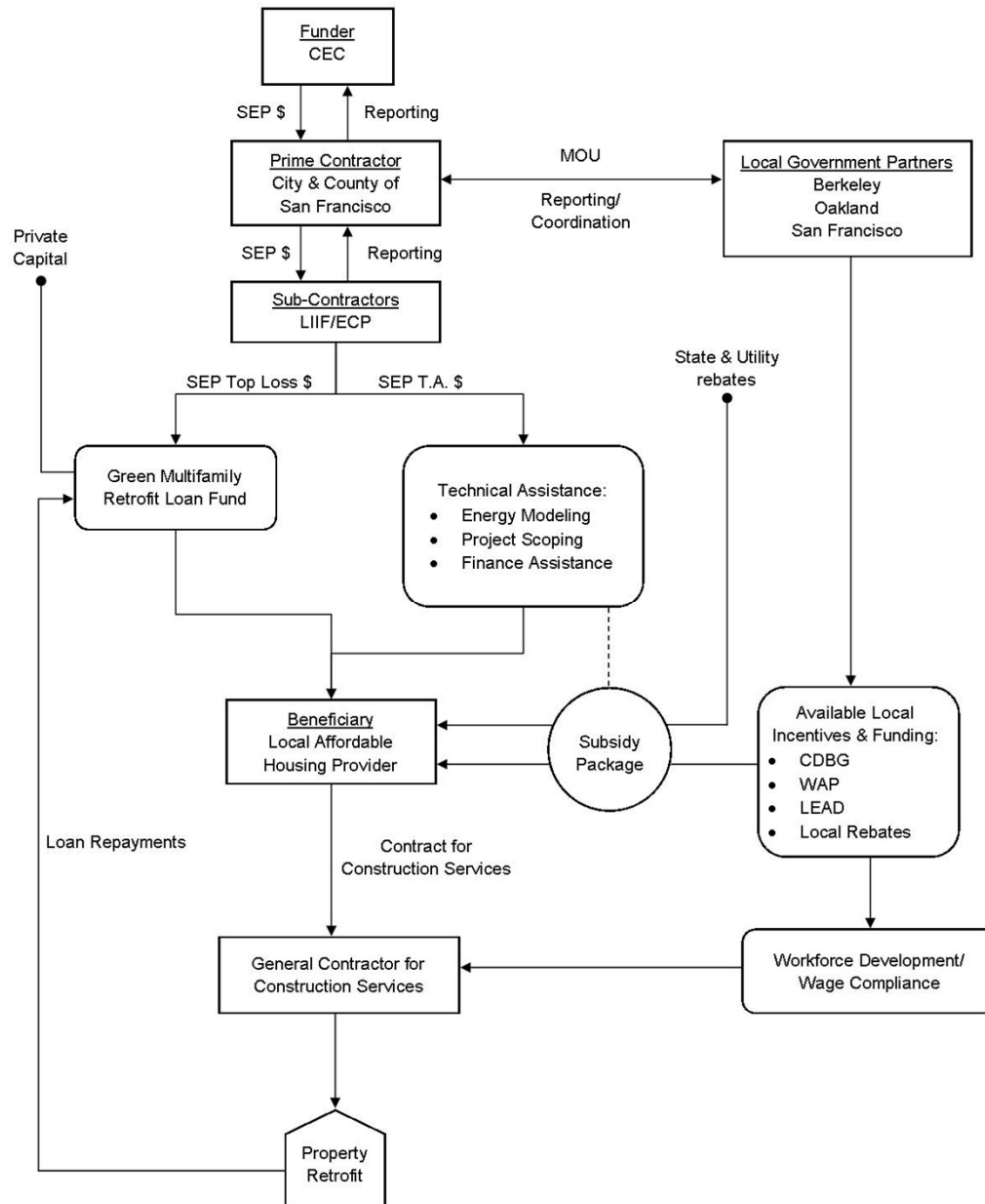
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SOURCES

Costs	WAP	CDBG	Non-Fed	Utility	Boiler	SEP	SFPUC	Solar
\$34,000	\$34,000							
\$40,000	\$30,113				\$9,887			
\$4,390	\$2,241		\$2,149					
\$18,480	\$17,738		\$742					
\$856		\$856						
\$4,582		\$4,582						
\$13,000		\$13,000						
\$20,720		\$20,720						
\$69,048					\$37,000	\$32,048		
\$28,300						\$28,300		
\$283,181	\$84,092	\$88,963*	\$2,891	TBD	\$46,887	\$60,343	NA	TBD

* Includes OH&P – cost detail not shown above

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CHALLENGES

- The principle impediment to cost-effectiveness is cost-effectiveness
- The principle impediment to program implementation is program requirements
- Leveraging, leveraging, leveraging!

In order for energy efficiency programs to successfully address the needs of permanent multi-family affordable housing, they must move from a direct-install prescriptive approach to a performance-based approach that allows for leveraging.

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SMUD Home Performance Program - Multi-Family

Program Implementer: The Heschong Mahone Group, Inc (HMG)

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SMUD \$20 Million Stimulus Grant

Comprehensive single- and multi-family retrofit Home Performance Program

Program Component	Energy Measures	Objectives
<i>Basic Audits</i> 1000 Homes	CFLs, Low Flow Showerheads	Provide information on Basic and Advanced retrofits
<i>Neighborhoods</i> 2000 Homes	Attic Insulation, Air Sealing, Weather Stripping, HVAC, Ducts	Basic and Advanced Retrofits
<i>Multi-Family Retrofits</i> 2000 Units	Attic Insulation, Air Sealing, Weather Stripping, HVAC, Ducts	Provide comprehensive performance-based audit recommendations and retrofit
<i>HERSII Audits/Ratings</i> 4150 Audits	None	Provide information on Basic and Advanced Retrofits
<i>Basic Retrofits</i> 4000 Homes	Attic Insulation, Air Sealing, Weather Stripping	First step towards Advanced, performance-based retrofits
<i>Advanced Retrofits</i> 2000 Homes	HVAC, Ducts, Wall Insulation	Ultimate objective

www.smud.org/homeperformance

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PROGRAM DESCRIPTION

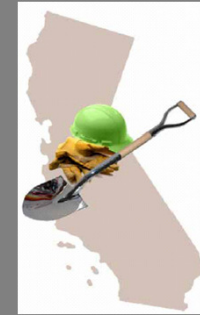
‘Shovel-ready’ program:

- Large Cash Incentives
- Energy Technical Assistance
- Comprehensive Assessment
- Building Energy Rating
- Program Coordination

Facilitate energy efficient upgrades in existing multi-family housing through cash incentives and technical assistance

www.smud.org/hppmulti

Funded by:



Part of a statewide effort:



Implemented by:



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OWNER CHOOSES PROJECT TEAM

- **Rater is the foundation of the program, as the:**
 - Auditor or 'assessor'
 - Energy modeler
 - Third-party verification agent
 - Provider of building energy score
- **Contractor installs the measures, is hired by the owner**
 - Owner chooses contractor and is not trained by program
- **Rater independent from the contractor**
 - At minimum to perform the post-retrofit verification
 - Contractor may perform assessment if they have met program training requirements

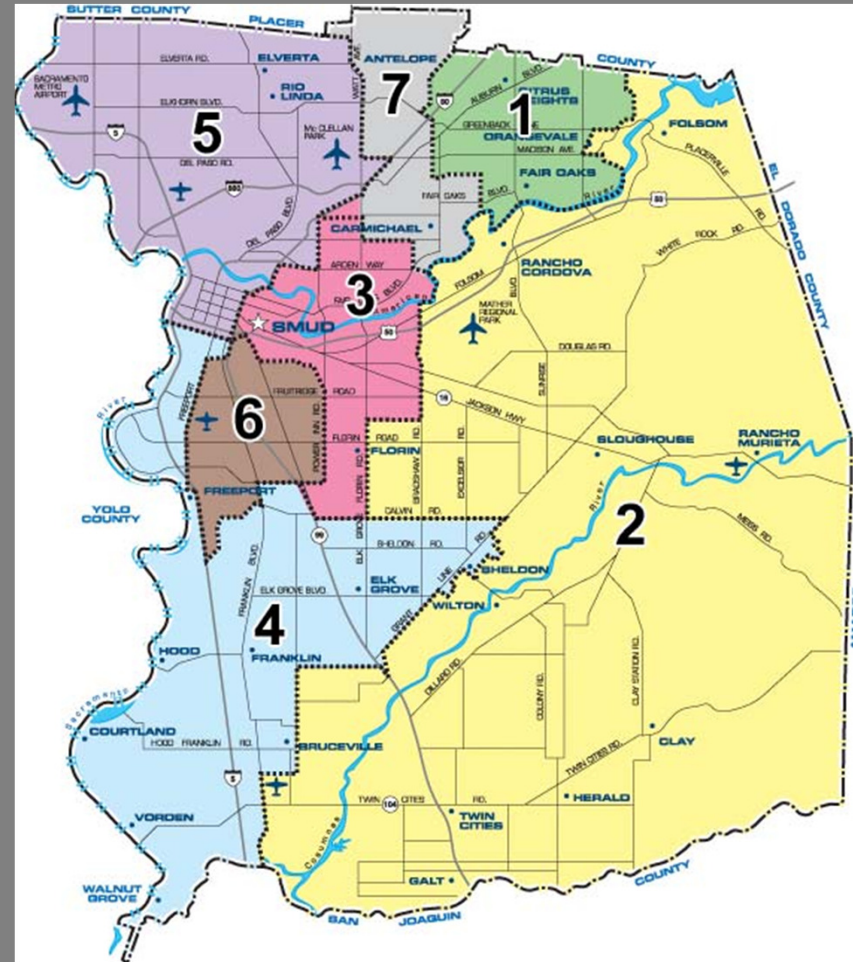
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ELIGIBILITY

Multi-family buildings in SMUD service territory:

- 5 or more attached units
- Existing construction
- Improve building energy consumption by at least 20% (energy modeling)
- Example building types: apartments, SRO*
- Both low-rise (3 or less stories) and high-rise (4 or more)

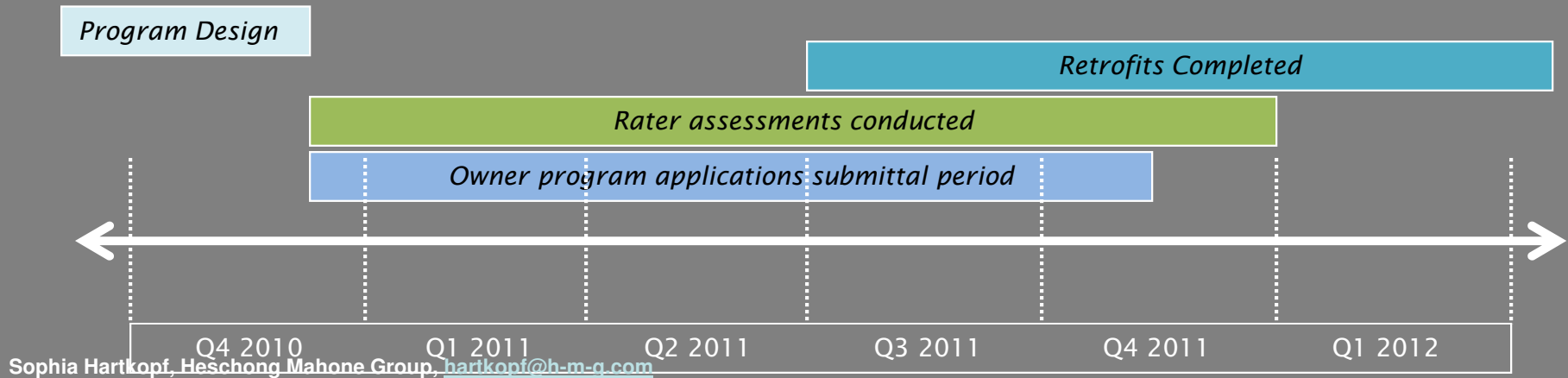
❖ *Please contact HMG if you are unsure of the eligibility of your project. For full program requirements, consult the HPP-MF Handbook*



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FUNDING, GOALS, and TIMELINE

- Program aims to retrofit 2,600 multi-family units
 - Affordable housing is a SMUD area of focus
- \$3.2 million dollars available for incentives
 - First come, first serve
- Program ends March 31, 2012. By this date:
 - All funding must be expended
 - Retrofit construction must be completed



SMUD INCENTIVE DOLLARS

- Per unit incentive based on minimum 20% improvement
 - from there incremental \$50/unit per additional 1% (up to 30%)

20%	\$2,300
25%	\$2,550
30%	\$2,800

Incentives are first-come-first-served basis until allocated funds are exhausted. The Program may be modified or terminated without notice.

- Incentives designed to help offset the retrofit costs:
 - energy measures, labor, and rater (cannot exceed total cost)
- Paid to contractor at 50% and 100% completion stages
 - contractors must follow prevailing wage requirements

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OTHER FUNDING SOURCES

- **SMUD rebates can cover up to 100% of costs**
 - Rebates more likely to cover 10-50% of total cost

- **Owners must bring additional capital to finance retrofits**
 - Owner reserves: capital and maintenance
 - Other utility rebates (i.e. PG&E, local water utilities)
 - Rebates range from \$20-500/unit
 - Weatherization Assistance Program (WAP)
 - Local Provider, Community Resource Partners: up \$6,500/unit in funding (savings allocated based on \$ contribution)
 - PG&E Low Income Energy Efficiency (LIEE) program
 - SHRA – HUD ESCO contract

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TYPES OF PROPERTY UPGRADES *

- Envelope
 - Windows
 - Roof/attic insulation
 - Wall insulation
 - Floor insulation
 - Cool roof/radiant barrier
- Heating and Cooling
 - Heating and Cooling equipment replacement
 - Duct sealing and insulation
- Water Heating
 - Water heating equipment replacement
 - Pipe insulation
 - Recirculation controls
 - Solar hot water
- Appliances
 - Indoor and outdoor lighting (hardwired)
 - Refrigerators and dishwashers

* Measures based on what can be modeled in HERS II software. You may take advantage of PG&E rebates on top of the performance program rebates.

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PROGRAM PROCESS

1. Property Viability Form (Owner)
2. Energy Assessment (Owner/Rater)
3. Application (Owner/Contractor/Rater)
4. Assessment Review (HMG)
5. Retrofit (Owner/Contractor)
6. On-Site Verification & Rating (Rater)
7. Completion Documentation (Owner/Contractor/Rater)
8. Payment (SMUD)



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UPGRADE PACKAGE EXAMPLE

Project	Upgrades	Efficiency	Cost
Rancho Cordova	110 units	27% improvement	\$301,450 (\$2,740/unit)
<i>Envelope</i>	Cool Roof	NA	\$170,400
<i>HVAC</i>	PTAC upgrade	(EER 6 > EER 10)	\$74,500
<i>DHW</i>	DHW upgrade (8 water heaters)	(EF 0.53 > Recovery 0.95)	\$46,000
<i>Rater Services</i>	Assessment, Modeling, Verification	NA	\$10,550

- SMUD construction rebate = \$147,400 (~\$1,340/unit)
- SMUD rater rebate = \$3,850 (\$35/unit)
- Owner investment = \$149,800 (~\$1,362/unit) or 50% of total cost

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UPGRADE PACKAGE EXAMPLE

Project	Upgrades	Efficiency	Cost
Sacramento	40 units	30% improvement	\$197,600 (\$4,940/unit)
<i>HVAC</i>	PTAC upgrade	(EER 6 > EER 10)	\$186,000
<i>DHW</i>	Recirculation Controls		\$6,000
<i>Rater Services</i>	Assessment, Modeling, Verification	NA	\$5,600

- SMUD construction rebate = \$112,000 (\$2,800/unit)
- SMUD rater rebate = \$3,050 (\$75/unit)
- Owner investment = 82,550 (\$2,063/unit) or 40% of total cost

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UPGRADE COST EXAMPLES

Project	Upgrades	Cost
Project 1 – 18 units	(~\$12,500/unit, ~\$7,500 no solar)	\$225,000
<i>Envelope</i>	Roof replacement & insulation	50,000
<i>HVAC</i>	Heat pump replacement	70,000
<i>DHW</i>	DHW replacement	1,500
<i>Appliances & Lighting</i>	ENERGY STAR Appliances	1,500
	Lighting Retrofit	8,000
<i>Renewables</i>	Solar PV & Hot Water	93,000
Project 2 – 62 units	(~\$3,500/unit)	\$225,000
<i>Envelope</i>	Roof insulation	60,000
<i>HVAC</i>	Cooling tower replacement w/VFD fan	50,000
<i>DHW</i>	Water heater replacement	40,000
	Replace boiler and condensate pumps	36,000
<i>Appliances & Lighting</i>	ENERGY STAR Appliances	17,000
	Lighting Retrofit	23,000

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UPGRADE COST EXAMPLES

Project	Upgrades	Cost
Project 3 – 82 units	(~\$3,000/unit)	\$250,000
<i>Envelope</i>	Reduce air leakage in common areas	12,000
<i>HVAC</i>	Heat pump replacement	156,000
<i>Appliances & Lighting</i>	ENERGY STAR appliances	48,000
	Lighting retrofit	20,000
	Elevator motors	7,000
	Photo/motion sensors	2,500
	LED exit signs	1,000
	Programmable thermostats	5,000

** These cost numbers are based on actual projects in the LA region from the Enterprise program*

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PROGRESS TOWARDS GOALS

- **~ 2,300 units submitted project viability forms**
 - 12 property owners, 38 project sites
 - Average property size ~60 units
(on average ~15 units/building)
 - ~90% of units are affordable
(~85% of properties)
- **8 assessments in process**
- **3 buildings under construction**
- **11 HERS II rater companies trained**

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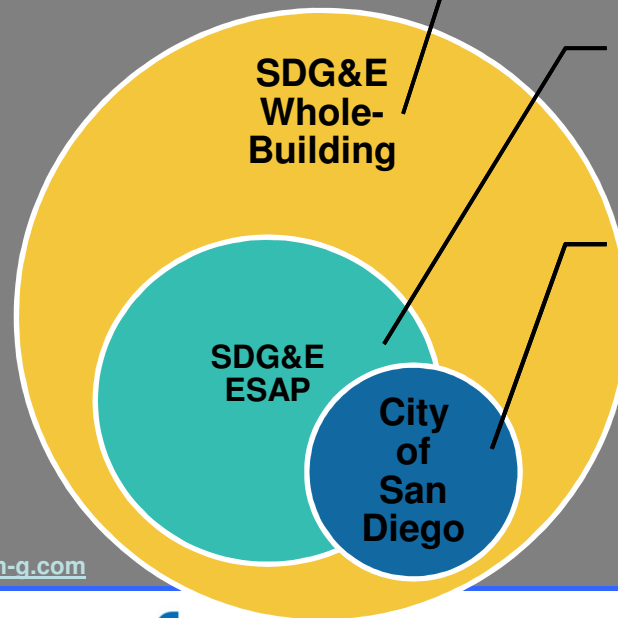
CHALLENGES

- **CEC stimulus documentation requirements**
 - Prevailing wage
 - Historical property review
 - Buy American
 - Waste Management
- **Adjust HERS II program for multi-family**
- **Financial viability of property owners**
- **Program timeline**

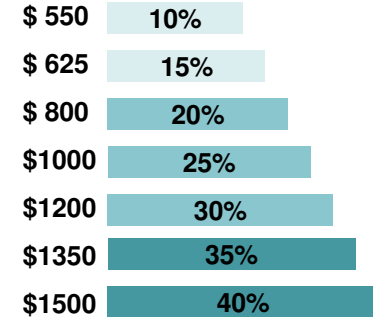
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ENERGY UPGRADE™ SAN DIEGO

- Goal: 2,000 multi-family units, complete by May 2012
- Eligibility
 - Located in San Diego County
 - Improve efficiency by min. 10%
- Layered incentives
- Additional program components:
 - Multi-family rater training
 - Tenant outreach
 - Energy management guidelines



- **Performance-based incentives**



- No income qualification

- Direct install (no cost) measures
- Low-income households

- **Performance-based incentives per % improvement**

\$35/unit bldg owner
\$5/unit HERS rater

- Low- and moderate-income properties

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ARRA & Beyond: Funding & Advocacy

- Summary of energy retrofit resources potentially available to owners of low income rental buildings in CA:
 - ✧ \$100 million in ARRA WAP Funding remains and must be used by March 2012 or it will expire (to find out which buildings are eligible and how to access this funding go to:
<http://chpc.net/preservation/OWNERRESOURCES.html>
 - ✧ \$300 million/year in LIEE services through contractors hired by investor owned utilities (IOUs) regulated by the CPUC.
 - ✧ \$500 million in energy efficiency rebates/incentives through various IOU programs regulated by the CPUC.

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ARRA & Beyond: Funding & Advocacy

- Summary of Barriers to Accessing LIEE resources:
 - ✧ Households must individually apply and agree to services.
 - ✧ Work can only be done inside units (no common areas) and cannot include improvements to HVAC or other bldg. systems.
 - ✧ Work must be performed by third party contractor, without any control/oversight by owner, from prescribed list of measures.
 - ✧ Not based on energy audit or in any way performance based.
 - ✧ Very difficult to combine with other rebates/incentives.
- Result: only 50% of eligible HH in rental housing receive LIEE

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ARRA & Beyond: Funding & Advocacy

➤ Potential Solutions to LIEE Barriers:

- ✧ Make properties categorically eligible at building level
- ✧ Determine SOW based on energy audit & projected savings
- ✧ Allow work to be done by owner, verified by 3rd party rater
- ✧ Allow improvements to HVAC to be included
- ✧ Require IOUs to create 1-stop point of entry for building owners and encourage leveraging of other rebate and incentive programs

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ARRA & Beyond: Funding & Advocacy

➤ Current Policy / Advocacy Efforts

- ✧ WAP multifamily guidance, property certification, outreach underway
- ✧ Dialog with CPUC and IOUs about multifamily pilot
- ✧ AB 1124
- ✧ Cap and Trade Allowances (\$650 million/yr and rising starting in '12)

➤ Next Steps & Opportunities

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Panelists

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