



# Serving the Existing Multifamily Buildings Market

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**Local Government Training**  
***Existing Multifamily Rehab Programs***  
***Help Meet Stimulus Goals, Improve Multifamily***  
***Buildings, and Serve Low-Income Families***

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# Meeting the Needs of the Existing Multifamily Buildings Market

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- Why Serve the Multifamily Market?
  - Energy Management
  - Operations and Maintenance
  - Benchmarking
  - Utility Allowances
  - Approaches to Rehab and Retrofit
    - Existing Programs
      - Weatherization Assistance Program
      - Prescriptive Options
      - Operations and Maintenance
      - Prescriptive Measures
      - Performance - Whole Building Approach
  - Comprehensive Energy Management and Decision Tree - How all the Above Fits Together
  - Integrating and Leveraging Existing Programs and Resources
  - Identify Gaps and Opportunities for Local Government Efforts
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# Multifamily Ownership and Use Structures and Building Types

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- For sale, for rent, market rate, affordable
- Mom and pop to large corporations to non-profit building owners (national, statewide, local)
- Small (2-49 units) individual owners represent largest group of apartment building owners
- Master or individually metered for electricity
  - Central systems and common area energy bills are building owner-paid
- High-rise, mid-rise, low rise, garden style
- Transitional, assisted living, dorms, apartments, condos, townhouses, etc

*Bottom line is that in terms of energy management and programs 'one-size-fits-all' is not applicable*

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# Energy Code Impacts on Multifamily

Residential Building Stock by Year and How T24 Addressed Multifamily		
Year	Multi-family Units	Title 24 Energy Code Events to Address Multifamily
1982	2,723,422	Built before T24 Energy Performance Requirements; HUD adopted insulation standards in 1975, CEC adopted whole-building prescriptive in 1977
1991	3,334,322	
2000	3,551,042	SHGC requirements tightened for multifamily
2004	3,718,122	Glazing and water heating loopholes not addressed until 2005 T24

- Multifamily not directly addressed until the 2005 energy code, not a focus of 7 prior code changes (1977, '82, '86, '88, '92, '95, or '98)
- *However: 2005 had the greatest impact on multifamily*
  - Credit for under 20% (or 16%) glazing area expired
  - Water heating budget established based on *actual* water heating type
  - Increased Residential lighting requirements

# Who are Multifamily Residents?

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**22% of Californians are apartment renters**

(Census Bureau)

- Low-income families
- Young families
- Senior citizens
- Immigrant population
- Baby boomers downsizing
- Young professionals choosing their first home
- People transitioning out of foster or rehab care
- More mobile population than single family

# Opportunities in the Multifamily Buildings Market

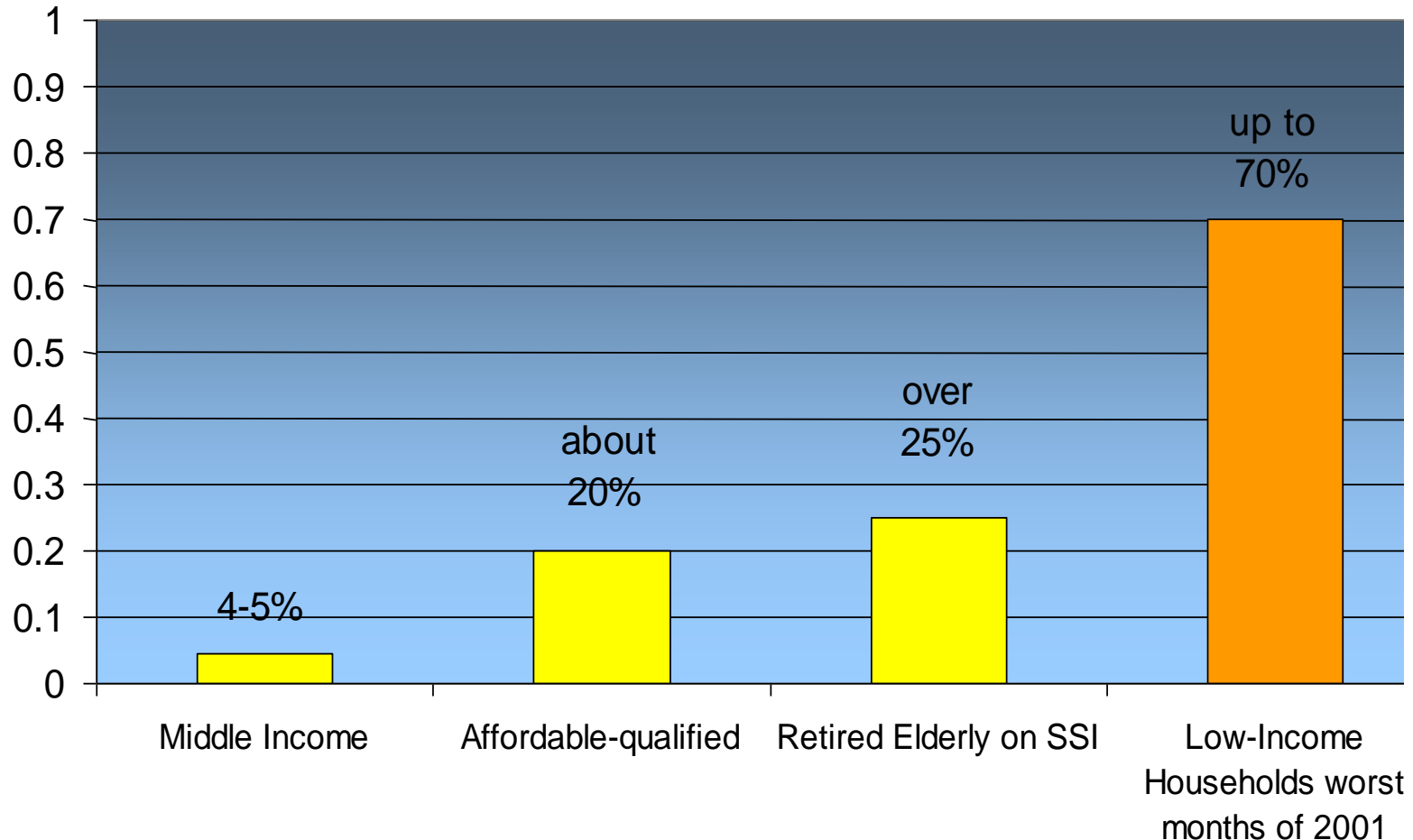
- Abundance of existing buildings on continuum of needing various energy upgrades (weatherization to comprehensive/major rehab)
- New construction market is being pushed by energy code updates
- Equitable mix of stimulus investments in single-family homeowners, municipal buildings, AND low-income families and seniors and rental residents
- Help contribute to the reversal of funding cuts for housing over the last administration:
  - housing providers focused on keeping people in homes and not cutting staff, rather than energy efficiency
- Help fund the “gap” for energy efficiency as public funds limited and competitive:
  - Energy efficiency was a luxury item
  - Energy efficiency oftentimes “value engineered” out of project

# Opportunities in the Multifamily Buildings Market

- Create jobs - “green” jobs and transition lost new construction jobs to rehab
- Invest in improving older communities
  - Upgrading older buildings
  - Dollars saved on energy bills results in additional money available to be spent in the community - multiplier effect
- Take advantage of lower transaction cost/dwelling unit and economies of scale
- Make homes more affordable, comfortable and healthy
- Combat rising utility costs
- Maximize energy savings, comfort, quality and minimize greenhouse gas emissions
- Provide options for energy efficiency upgrades - weatherization to comprehensive

# Utility Impact on Home Affordability

*Affordability is more important in the multifamily market than any other*



*Most low-income families live in multifamily buildings*

# Challenges: Split Incentives

- Owner pays for improvements -> Resident's benefit from lower utility bills
  - Cannot recoup investment through rents in affordable housing
  - Most interest in lowering operating costs of common area/central systems
    - but not so much in the dwelling units
  - Residents have no control over energy efficiency upgrades and capital investments
    - but can control behavior
  - Owners don't invest in encouraging tenants to change behavior to lower utility bills

## Party Responsible for Electricity and Gas Among Rented Occupied Units

	Landlord	Occupant	Don't Know	Sample Size
Electricity Costs	3%	97%	0%	494
Gas Costs	11%	88%	1%	456

\* RLW Analytics, Inc. California Statewide Lighting and Appliance Saturation Study Final Report. 2000

# Support State and Local Strategies

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## California Strategic Plan

- Groundbreaking Long Term Energy Efficiency Strategic Plan is California's Roadmap to Achieve Maximum Savings
  - 2009 to 2020: state's first integrated framework of goals and strategies for saving energy, covering government, utility and private sector actions
  - Holds energy efficiency as the highest priority resource in meeting California's energy needs
  - California's 'Big Bold' Strategies for significant energy savings
    - All new residential construction in California will be zero net energy by 2020
    - All new commercial construction in California will be zero net energy by 2030
    - The Heating, Ventilation, and Air Conditioning (HVAC) industry will be reshaped to ensure optimal equipment performance; and
    - All eligible low-income homes will be energy-efficient by 2020
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# Support State and Local Strategies

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- **AB 549 Reducing Energy Consumption in Existing California Buildings**
    - Building Diagnostic Testing and Repair
    - California Home Energy Rating System (HERS) program
    - Information Gateway
    - Assistance to Affordable Housing
  - **AB 32 - California Global Warming Solutions Act of 2006**
    - Reduce and eventually cap statewide emissions of greenhouse gases
    - Emissions to be reduced to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050
  - **AB 375 - Redesigning Communities to Reduce Greenhouse Gases**
    - Provides emissions-reducing goals for which regions can plan
    - Integrates disjointed planning activities
    - Provides incentives for local governments and developers to follow new conscientiously-planned growth patterns
    - Enhances the Air Resources Board's (ARB) ability to reach AB 32 goals
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# Support State and Local Strategies

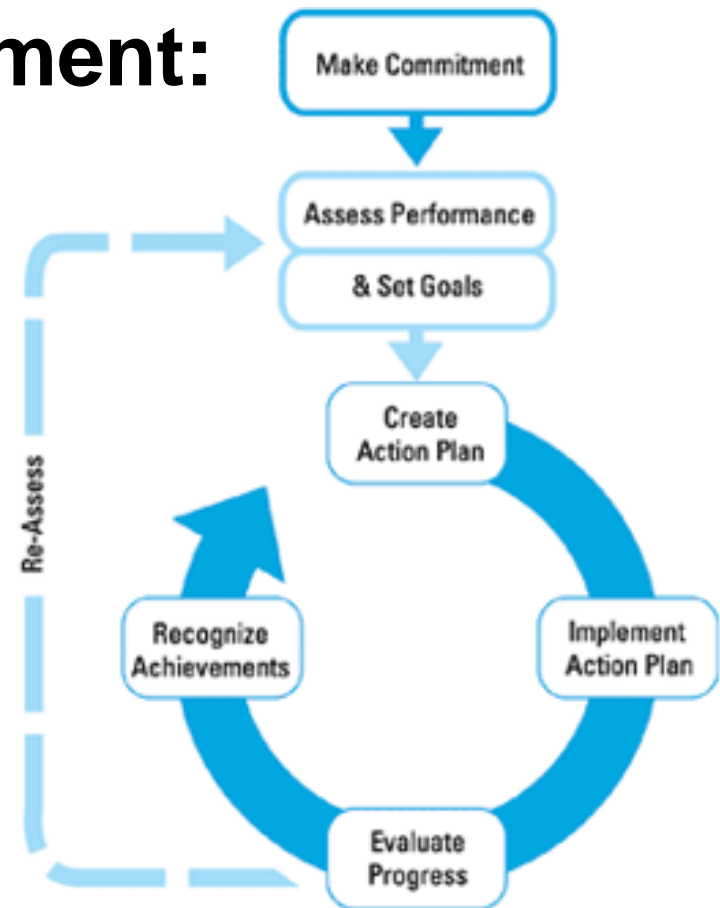
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- **AB 811**
  - Gives cities and counties authority to create benefit assessment districts in which property owners can decide to “finance” energy upgrades
  - Owners would enter a “loan” contract with a local government and pay it back via an item on their property-tax bills that would be passed from one owner to the next over 10 or 20 years
  - It would be senior to any other debt

# EPA's Energy Management Cycle (Impacts Beyond Stimulus Funds)

## Steps to Energy Management:

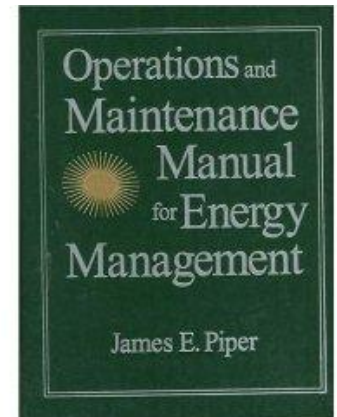
- Make Commitment
- Assess Performance
- Set Goals
- Create Action Plan
- Implement Action Plan
- Evaluate Progress
- Recognize Achievements



# Operations & Maintenance Practices

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- Ongoing O&M practices encourage energy efficiency beyond program investments
- Training building managers in proper operation and maintenance on equipment, such as:
  - Tune-ups, Prevention, Repairs
  - Sealing holes in the building envelope
  - HVAC tune-ups
  - Water heater or boiler tune-ups
  - Adjusting thermostat temperature settings on space and water heating systems
  - Adjusting refrigerator and freezer temperatures
  - Checking for water leaks



# Benchmarking Multifamily Building Performance

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- Monitoring tool that estimates energy and water consumption and green house gas emissions
- Allows comparison with other buildings of the same type and location and tracking building performance over time
- An integral step in managing a building's energy cost:
- Benchmarking helps to:
  - Track and assess energy and water consumption across an entire portfolio of buildings
  - Track greenhouse gas emissions reductions and achievements
  - Identify under-performing buildings
  - Set investment priorities
  - Establish and benchmark efficiency goals
  - Verify efficiency improvements



# Three Ways to Lower Utility Allowances to Reflect Energy Efficient Buildings

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- Utility Cost Estimates
- Energy Efficiency-Based Utility Allowances
- Energy Consumption Model
  - Addressed for TCAC new construction projects via the California Utility Allowance Tool
  - Rehab still needs to be addressed
  - Needs to be a priority

# Energy Efficiency-Based Utility Allowance Schedule

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## **Adopted by about 20 PHAs in CA (including SD HCD)**

- Lower utility allowance for both new construction and rehab
- Like SUA – represents average energy use for energy efficient projects
- Lower adjustment of the numbers of SUA
- Retrofit – 20% improvements corresponds to a 20% reduction in energy costs
- New Construction – Building simulation - develop a ratio of energy use in energy efficient new construction (15% above code) compared to a typical existing building (pre 1980 building practices). Ratio applied to SUA

# Why is Lowering Utility Allowances Important to Local Governments?

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- Correcting artificially high utility allowances in relation to energy efficient projects
- Creating more sustainable housing - impact on greenhouse gases
- Sense of partnership with owners/developers in facilitating new projects and energy efficiency/green
- Benefit – some developers avoid building in jurisdictions with high utility allowances – not economically feasible
- Fulfills City/County commitments to energy efficiency/green

# Existing Retrofit Programs: Weatherization

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- Weatherization Assistance Programs
  - California Department of Community Services and Development (CSD)
  - LIHEAP (the Low-Income Home Energy Assistance Program) and the U.S. Department of Energy's Weatherization Assistance Program
    - Weatherization reduces utility costs for by improving the energy efficiency and ensuring health and safety
    - Focus on elderly residents, disabled, and families
    - In many states, Weatherization funding favored single-family housing
    - California's 2008 Weatherization plan directs implementers provide services equitably to both homeowners and renters
      - At least 66% of dwelling units are occupied by eligible applicants
    - In small multifamily buildings containing 2-4 units, 50% of the dwelling units must be eligible
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# Existing Retrofit Programs: Weatherization

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- **For any retrofit/rehab effort for low-income, WAP should be considered as a first step in improving buildings**
  - **Get the free stuff first**
  - **Weatherization services offered by providers:**
    - **In-home energy education**
    - **Energy-related home repairs**
    - **Blower-door guided air sealing**
    - **Heat system safety tests, repairs, and tune-ups (and replacements for safety reasons)**
    - **Duct insulation and sealing**
    - **Attic insulation**
    - **Hot water savings measures (insulation blankets and low-flow showerheads)**
  - **<http://www.csd.ca.gov/Programs/Energy%20Service%20Providers.aspx>**
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# Existing Retrofit Programs: Prescriptive Upgrades

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- Effective programs throughout the state
  - Typically to replace failed or worn equipment – immediate need
  - Measures often chosen by immediate need or available incentives
  - Not always the most cost effective improvement
    - Can result in missed opportunities for deeper energy savings
  - Deemed energy savings
  - Per unit incentives (unit or sf, etc)
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# Existing Retrofit Programs: Prescriptive Upgrades

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- Statewide utility programs to replace:
    - Attic and Wall
    - High performance windows
    - Cool roofs
    - Space heating equipment
    - Space cooling equipment
    - Water heaters/boilers
    - Recirculation pumps
    - Light fixtures
    - Ceiling fans
    - Refrigerators
    - Dishwashers
    - Clothes washers and dryers
    - Pool pumps and motors
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# Existing Buildings: Comprehensive Approach

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Gap: need for comprehensive approach

- Integrated, whole-building approach
- Building science approach
  - Similar in approach to Home Performance with ENERGY STAR® program - but has target
  - Captures synergistic energy savings from multiple measures
  - Maximizes the energy savings to reduce payback period and save on costs
- Requires energy/building science expert (new jobs)



# Existing Buildings: Comprehensive Approach: Model Program Designed for Comfort (DfC)

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- Turn-Key, Proven, Cost-Effective Program Design
- Whole-Building Approach
  - Simulation with CEC approved software
- Information Clearing House
  - Programs and funding
  - Resources
- Target Affordable Housing
- Performance-based program
- Creates green jobs:
  - Energy consultants (evaluate energy efficiency options) - typically engaged in new construction only
  - HERS Raters conduct audit and final inspection) (typically engaged in new construction only
  - Home Energy Performance Contractors - emerging field



# Existing Buildings: Comprehensive Approach: Model Program Designed for Comfort (DfC)

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- HERS energy audit
- Energy consultant: simulation modeling – 2 models
  - Existing conditions
  - Show 20% improvement in dwelling units over existing baseline
    - Space Heating
    - Space Cooling
    - Water Heating
    - Insulation
    - Windows
- HERS verification following installation



DESIGNED FOR COMFORT

# Designed for Comfort Incentives

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- Performance-Based Program
  - Up to \$700/dwelling unit for LARGE projects
  - Up to \$1500/dwelling unit for SMALL projects
  - Up to \$500/unit for Special Needs projects
  - Energy consultants (\$40/unit, max. \$5,000/project)
  - HERS raters (\$50/unit, max. \$6,000/project)
  - Energy Smart Pak (worth \$35/pak) provided to each tenant of participating project
  - Tenant training



# LA Eco- Village Case Study

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- **Project name:**  
Los Angeles Eco-Village
- **Owner:** Cooperative Resources & Services Project (CRSP)
- **Location:** Los Angeles, California
- 46 unit project enrolled in DfC
- Two 1920's apartment buildings



# L.A Eco Village: Case Study

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- Upgrades improved energy efficiency by more than 30%:
  - From single pane French doors to dual pane glass doors
  - Attic insulation from R-0 to R-30
  - New central temperature controls for domestic water heater
- In addition to energy efficiency, project incorporated many other green features

“This project has brought us in closer alignment with our ecological values and has sure made a difference in our comfort,” states Lois Arkin, Executive Director of CRSP

# L.A Eco Village: Case Study

- Total cost of upgrades = approx.\$32,100
- DfC incentives provided 100% of the funding
- Upgrades = combined annual energy savings for tenants and owners of \$4,700 in electric bills and \$3,900 in gas bills

Measures	Cost
Insulation	\$9,630
Central boiler with demand control	\$1,816
Glass Doors	\$20,645
<b>Total Cost</b>	<b>\$32,091</b>
<b>Incentives through DfC</b>	<b>\$32,091</b>
Net Costs	\$0
Electric Savings/Year	\$4,700
Gas Savings/Year	\$3,900
Total % Improvement	30%

# L.A Eco Village: Case Study

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- Net cost to owner = zero
- Upgrades resulted in more comfortable homes for tenants
- For both owner and residents:
  - means fewer complaints
  - reduced maintenance costs, and
  - greater pride in their properties/homes



# San Diego Youth and Community Services Take Wing Apartments

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## Take Wing

- Transitional living community
- Break cycle of homelessness
- Create hope and self-sufficiency
- Teach homeless teens, teenage moms, young families, and those "aging out" of the foster care system to become independent and productive members of society.



# San Diego Youth & Community Services Take Wing: 5 Buildings, 33 Units

## Payback Analysis

<b>Measures - DFC Incentives</b>	<b>Cost</b>
to Vinyl Low-E Windows	\$44,222
Central boiler w/temperature control	\$2,600
Total Cost	\$46,822
<b>Incentives</b>	<b>\$23,100</b>
Net Costs	\$23,722
Net Cost Per Unit	\$719
Owner Savings/Year	\$2,301
Tenant Savings Per Year	\$250
Total % Improvement	20%+
Owner Payback Period	10.3

# Case Study – Flanders Pointe

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- Flanders Pointe Apartments
- Tustin Affordable Housing Corporation
- Steadfast Companies
- Orange County, California
- 2-story, 82 units, 57,572-square-feet



# Case Study – Flanders Pointe

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After upgrades, energy efficiency was calculated to be approximately 37% greater than existing conditions

- **Project Base Case:**
  - Built in the 1960s
  - Single-pane windows
  - No roof or attic insulation
- **Building Upgrade Measures:**
  - Attic insulation (R-30)
  - Domestic hot water pipe insulation
  - Air conditioner tune-up
  - Exterior solar window shades
  - Central boiler demand controller

# Case Study – Flanders Pointe

- Owner received a \$28,000 incentive to offset the cost of upgrades (40 units eligible for cash incentives)
  - Cost of upgrades approximately \$700 per dwelling unit
  - Net cost to the owner for the upgrades = Zero!
- Total building energy savings approximately 34,000 kWh per year = \$47,591 per year
- Upgrades projected to reduce each tenant's utility bills by approximately \$580 annually

<b>Cost Savings Associated with Energy Upgrades, Flanders Pointe Apartments Example</b>					
	<b>Energy Savings KWh/sqft/yr</b>	<b>Cost Savings \$/sqft/yr</b>	<b>Total Building Energy Savings KWh/yr</b>	<b>Total Building Cost Savings \$/yr</b>	<b>Cost Savings for each tenant \$/yr</b>
Space Heating	0.03	\$0.00	1,910	\$267	\$3
Space Cooling	5.88	\$0.88	338,025	\$47,324	\$577
<b>Total</b>	<b>5.91</b>	<b>\$0.89</b>	<b>339,935</b>	<b>\$47,591</b>	<b>\$580</b>

# Where are the Gaps in Existing Programs?

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## How Can Local Government Programs Fill These Gaps?

- Promote all existing programs and guides to selecting the appropriate approach - don't duplicate
- Work with existing programs: integrated approach to navigating programs, resources, and services
- Provide energy management education and training for multifamily building owners
- Provide technical and marketing training for HERS raters, energy consultants, and home performance contractors to address existing multifamily buildings (new jobs)
- Establish a comprehensive approach incentive programs - holistic or "building as a system" approach - to include buildings, common areas, infill, redevelopment, mixed-use projects

# Where are the Gaps in Services?

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## How Can Local Government Programs Fill These Gaps?

- Coordinate with green and solar programs - continuum of energy efficiency, green, and solar
- Promote emerging tools for existing, whole-building analysis
- Promote tracking and monitoring of actual energy savings post rehab/retrofit
- Establish finance mechanisms for energy efficiency upgrades for multifamily (AB811, shared savings, performance contracting, and low interest
- Adopt an Energy Efficiency-Based Utility Allowance Schedule for existing buildings
- Augment financial incentives through grants, require energy efficiency in NOFAs, etc.
- Outreach and education to change resident behavior - people use energy, not buildings

# Energy Management in Multifamily Buildings

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- Local governments can encourage ongoing and long-term energy management planning and practices rather than a one-time effort by:
  - Requiring energy management plans to qualify for programs/assistance
  - Encouraging varying approaches at different times in the building lifecycle
  - Promoting resources that help develop plans
  - Helps to promote existing programs
  - Comprehensive energy management goes beyond program or funding infusions
  - Promote utility and public service energy management classes
  - Provide operations and maintenance education specific to multifamily owners

# Existing Retrofit Programs: Weatherization

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- Local governments can leverage weatherization programs by:
  - Requiring qualified affordable housing building owners to pursue weatherization programs as their first consideration of retrofit or rehab efforts
  - Promoting weatherization programs and services

# Contact Information

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