



Trends in Comprehensive, Whole-Building Multifamily Programs

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Presentation Agenda



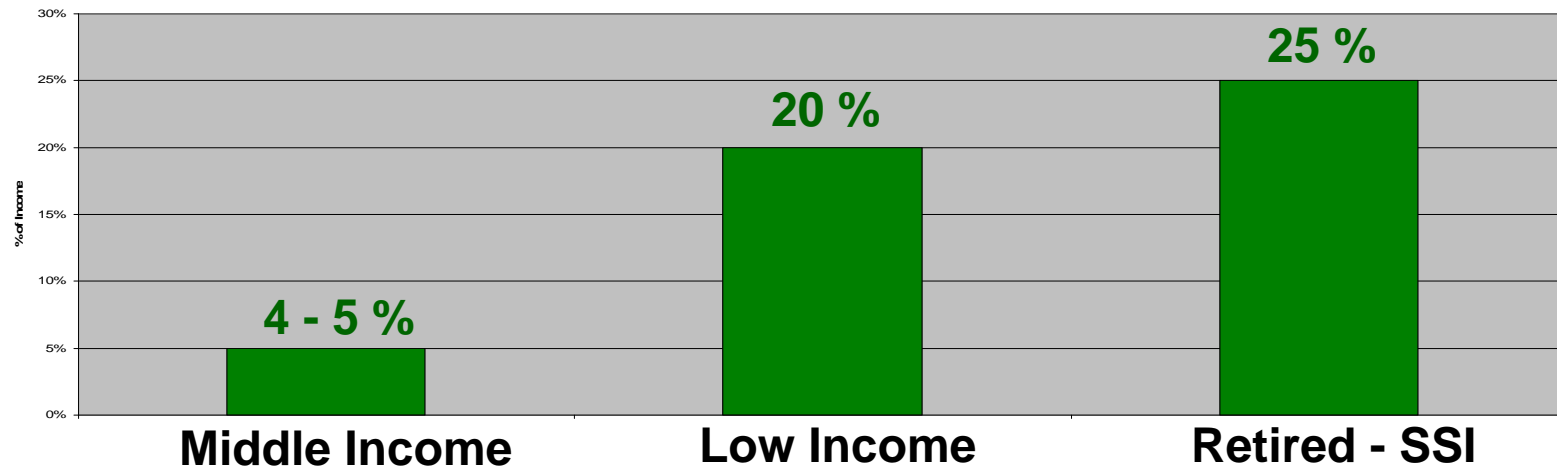
1. State of the California's:

- Multifamily Market
 - Characteristics of the Multifamily Market
- Existing Multifamily Building Programs
 - Approaches to Rehab
 - Example of a Whole Building Program

2. Keys Components Needed to Develop the Multifamily Existing Buildings Market

- Building Owner Decision Tools
- Infrastructure and Technical Capacity
- Policies, Funding, and Financing
- Complimentary and Supporting Programs

Why Focus on Multifamily Buildings?



- 22% of Californians are apartment renters -(Census Bureau)
- Where most low-income families live
- Affordability more important in multifamily market than any other
- Multifamily is typically underserved market by program offerings
- Cheap does not equal affordable
- Cheap invite complaints, discomfort, and wastes energy
- Unique market characteristics

Characteristics of the Multifamily Market



- Typically underserved market
 - Focus on low-income tenants, and less on building owners
 - Focus on single family homeowners
- Complex ownership structures
- Split incentives
 - Owner invests, tenant benefits
- Complex building types: high-rise, low-rise, construction
- Varying vintages: buildings, systems, and measures
- Individually vs. master-metered for electricity
- Multifamily oftentimes not specifically address by energy code updates

Multifamily Buildings by Vintage



Estimated 3.5 million multifamily units exist in California

Residential Building Stock

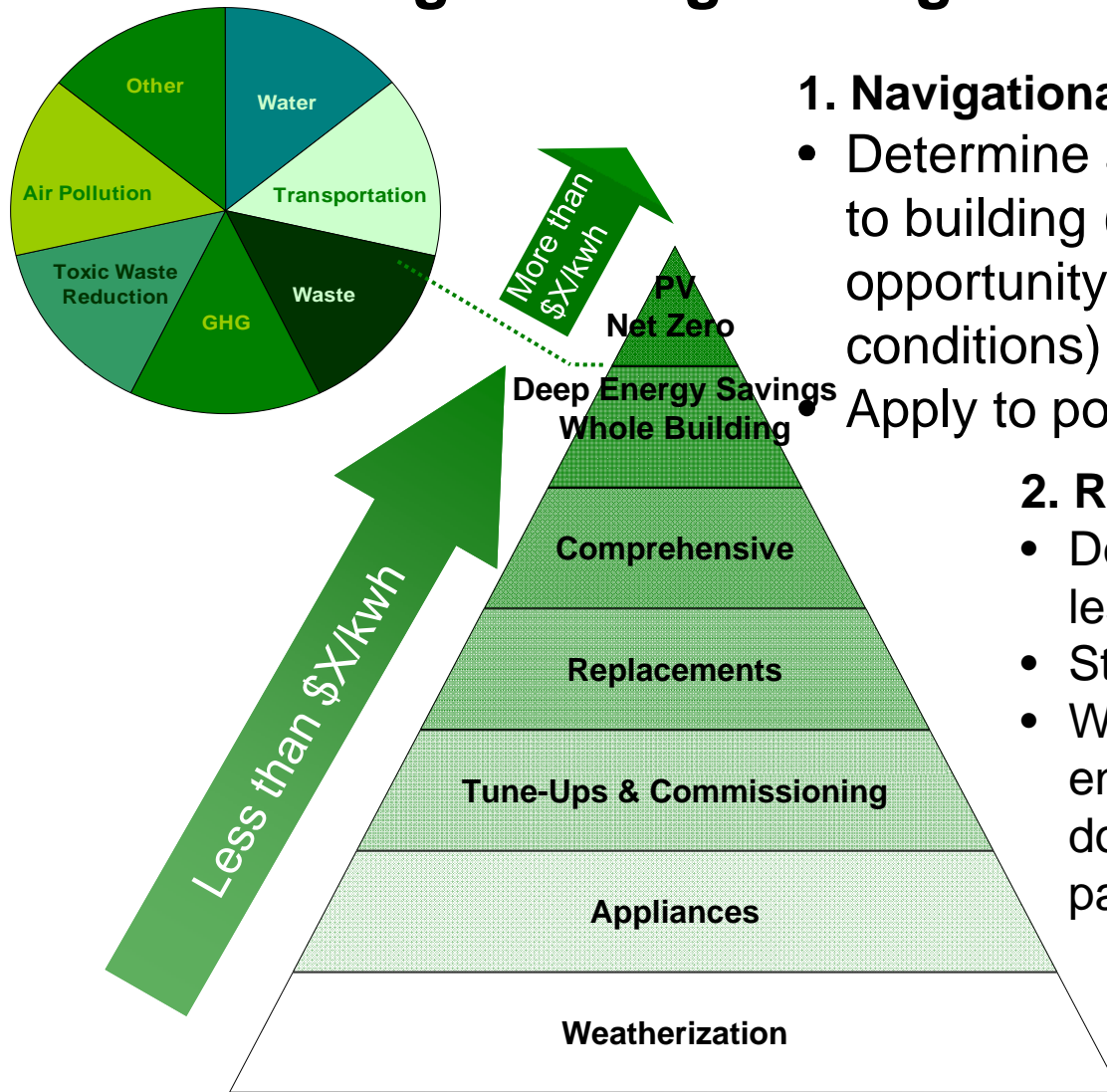
	Single-Family Dwelling Units		Multifamily Buildings	
	Units Added	Total Units	Units Added	Total Units
pre-1982		5,554,290		2,723,422
1982-1991	1,080,354	6,634,644	610,900	3,334,322
1992-2000	720,714	7,355,358	216,720	3,551,042
2001-current	193,220	7,548,578	73,577	3,624,619

Over half (2 million) constructed before there was an Energy Code

- **Multifamily not directly addressed until 2005**
- **2005 code closed loopholes**
 - Credit for under 20% (or 16%) glazing area expired
 - Water heating budget established based on *actual* water heating type
 - Increased residential lighting requirements

One Size Does Not Fit All

Approaches to Rehab, Investment Level, Loading Order Moving Buildings Along the Net Zero Continuum



1. Navigational Tool

- Determine appropriate approach specific to building (investment level, savings opportunity, need, vintage of existing conditions)

Apply to portfolios of buildings

2. Reduce, Then Produce

- Deep savings first - savings cost less than generating
- Start with a Prius - not a Hummer
- When to spend your last dollar on energy efficiency and your first dollar on solar? When cost and the payback are equal

3. Add Green Measures

Water, GHG, Air Quality, Trash, etc

Example Program: Designed for Comfort



- Whole-building, comprehensive, performance-based
- Improve efficiency by a minimum of 20% over existing conditions (heating, cooling, water heating)

Type	Amount/Unit
Building Owner	\$700
Energy Consultant	\$40
HERS Rater	\$50

Since 2004, on average:

- 30% improvement above existing conditions
- 599 kWh savings/unit
- 1.2 kW savings/unit
- 67 therm savings/unit



DESIGNED FOR COMFORT

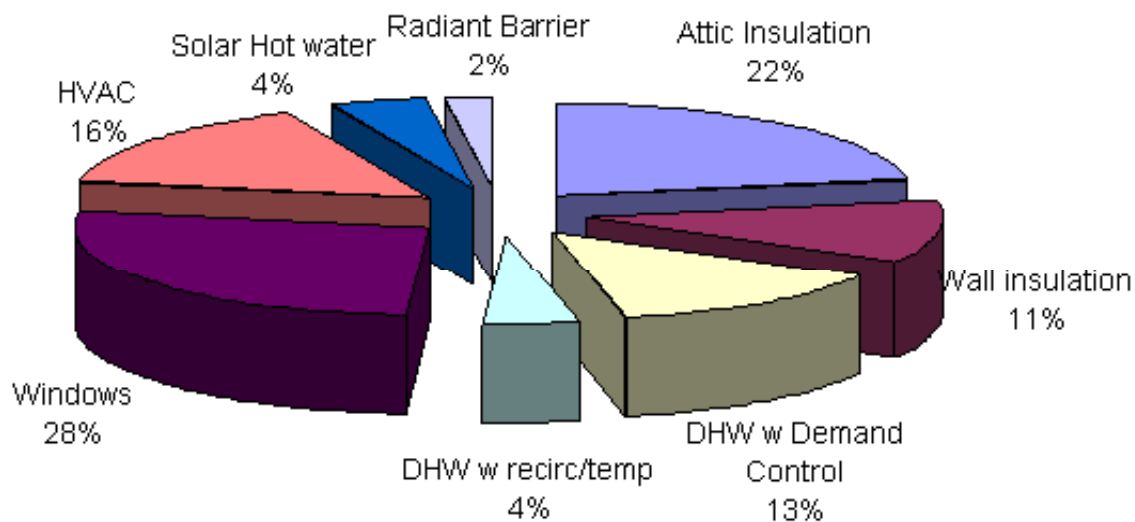


Designed for Comfort - On Average:



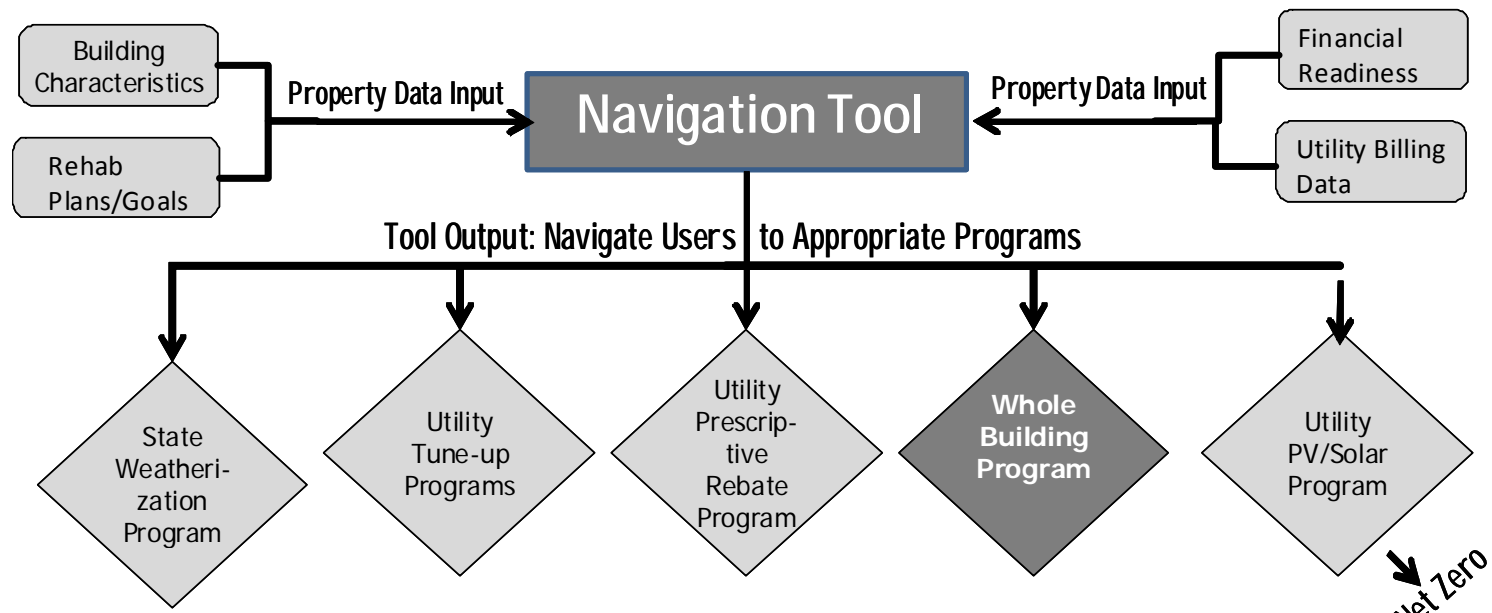
- \$2,165 installed cost/unit before incentive
- \$1,329 installed cost/unit after incentive
- 2-3 measures/project including:
 - DHW - demand controls, recirc/temp, solar, boiler replacement
 - HVAC - furnace, heat pumps, PTACs
 - Insulation - wall and attic
 - Windows

EE Measures Installed



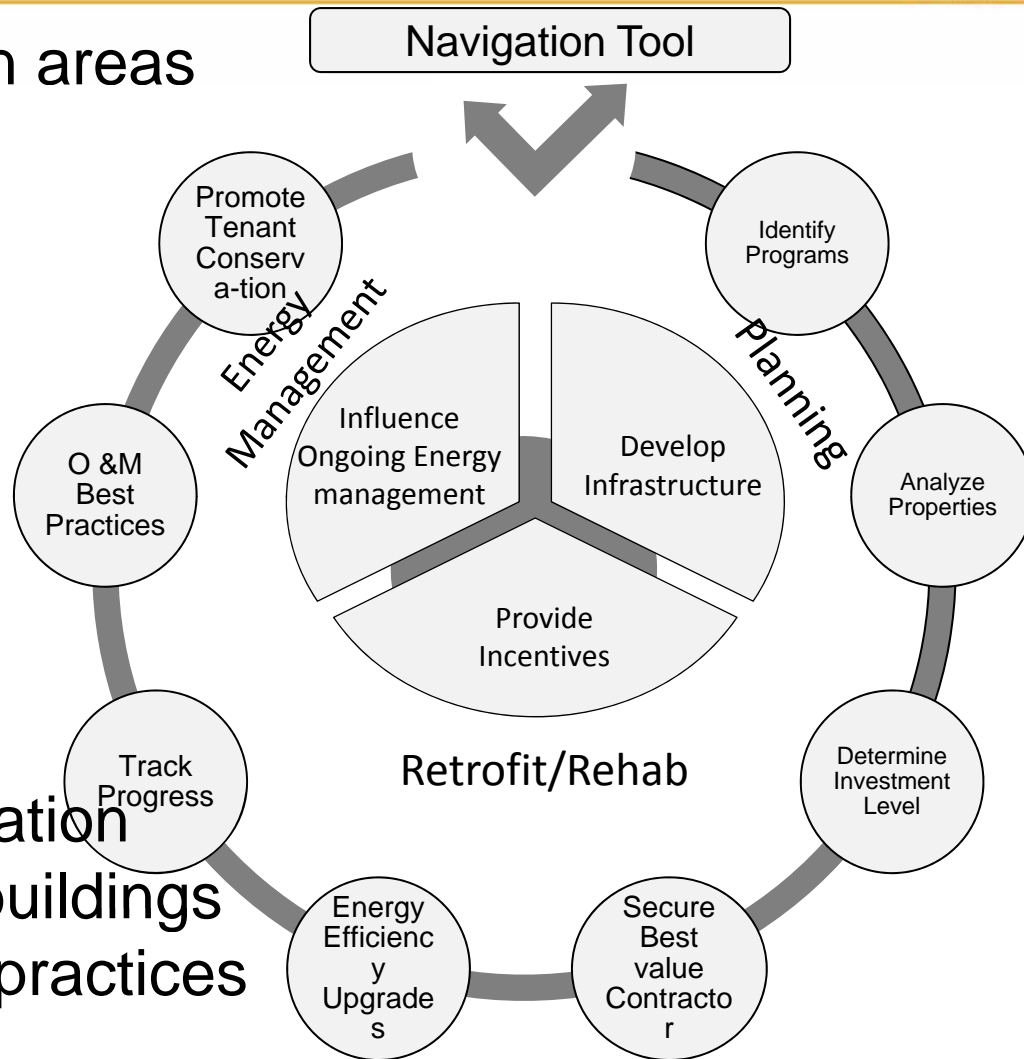
Need Building Owner Decision Tools

- Develop simplified tools to help building owners make the best investment decisions
 - Navigational tool - which approach(es) is/are appropriate for my building(s)
 - Match approaches to local incentives/resources
 - Encourage all properties to take some action, even if the whole-building approach is not appropriate
 - Cost analysis tool - SIR, ROI, NPV, Simple payback, lifecycle



Need Whole-Property, Performance Programs

- Whole-building, common areas
- Lighting and appliances
- Net Zero/PV component
- Green options
- Performance-based incentives



Post investment practices

- Tenant behavior
 - Proper use and conservation
 - People use energy not buildings
- Energy management best practices
 - Beyond investment
 - Comprehensive
 - Develop process

Need MF Infrastructure and Technical Capacity



- Comprehensive, systematic
- Defensible to lenders
- Codify audit, diagnostic, and verification protocols
 - Building simulation tool:
 - Compare existing to code
 - Parametric runs to compare options
 - Incorporates cost-benefit analysis
 - Quantifying non-traditional energy savings: water, embodied energy
- Train and certify industry
 - Develop multifamily building expertise
 - Employ ongoing, comprehensive energy management best practices

Need Equitable Policies, Funding, and Financing

Largely focus on single-family

- Energy Efficiency Tax Credits and Deductions
 - Largely do not apply to multifamily building owners or rental properties
- CPUC (CALSPREE), DOE (Building America, Retrofit Ramp-Up), ARRA: SEP, Block Grants
- Financing Options
 - Develop mechanisms for financeable energy savings
 - Foster energy efficiency criteria among lenders
- Financing for Multifamily Building Owners
 - On-bill, energy efficient mortgages, assessment district
- Utility Allowance Reform
 - Clear mechanism to lower utility allowances for energy efficiency properties

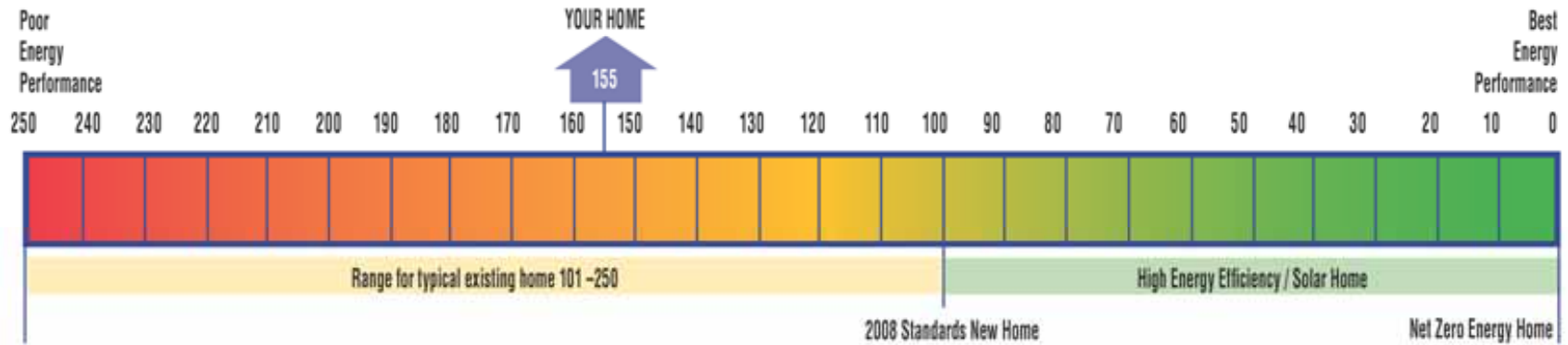
Need Complimentary and Supporting Programs



- **ENERGY STAR®**
 - Labeling for multifamily whole-building
 - Benchmarking (compare, rate, and track actual energy use)
 - Solutions for individually metered units, ABS
 - **Green Programs**
 - Build It Green: Green Point Rated (pilot underway)
 - LEED
 - **Federal Tax Incentives**
 - Focus on homeowners and commercial buildings
 - Need to clearly spell out multifamily (rental) buildings, owners, developers
 - **California Energy Commission's HERS Phase II**
 - Consistent, accurate, and uniform Whole-House Home Energy Ratings - single statewide rating scale
 - Labeling meet the needs of home buyers, homeowners, renters, the real estate industry, and mortgage lenders
 - Reasonable estimates of potential utility bill savings and reliable recommendations on cost-effective measures to improve energy efficiency
- Establish a common denominator or scale for energy efficiency***



HERS Phase II: Sample Rating Certificate



Information goes here on compliance with other programs: Qualifying Information Goes Here: HERS Provider and/or Sponsor and/or Sponsor Co-Branding Logos Go Here:	Energy Impact Greenhouse Gas Emissions Carbon Dioxide xxx tons/year Energy Consumption Electricity (kWh/year) Cooling --- Lights --- Appliances --- Total --- Natural Gas (therms/year) Space Heating --- Water Heating --- Total --- Operating Cost (\$/year) Electricity --- Gas --- Total --- Renewable Energy Production None Ancillary Energy Uses Swimming pool Spa Landscape lighting	Site Information Address 123 Jones Street Anywhere, California 9410x General Information Conditioned Floor Area 2,200 ft ² Bedrooms 4 House Type Single Family Foundation Type Slab-on-Grade Energy Efficiency Features Insulation Ceiling R-19 Wall R-11 Floor over crawlspace None Slab Edge None Windows Frame Aluminum Glazing Single Heating System Gas furnace, 0.80 AFUE Unsealed air distribution ducts Cooling System None Water Heating System Gas storage type, 0.52 EF	Official Home Energy Rating in conformance with the requirements of the California Energy Commission www.energy.ca.gov HERS Provider: Acme Energy Rated Homes 934 Energy Efficient Way Power Junction, California www.AcmeEnergyRatedHomes.com Rating Information Rating Number xxxx-yyyy Certified Rater EEH, Inc. Stockton, CA Rating Date: January dd, yyyy _____ Rater Signature Date
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Opportunities for Innovative Programs

- Increasing focus on existing buildings, deep energy savings, and comprehensive programs
- Need to address behavioral component
- Need to address efficiency throughout the building lifecycle - beyond design, build, and rehab investment
- Windfall of funding (ARRA, utility) for existing buildings
- Policy focus on energy (CALSPREE, AB 549) and greenhouse gas emissions (AB 32)
- Multifamily not clearly spelled out - underserved
- Complexities of the building characteristics

How are your programs addressing multifamily buildings?



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