The Carrot and Stick of Affordable Multifamily New Construction

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ABSTRACT

Demand for affordable housing in California far outstrips current development rates, and housing costs are rising faster than household incomes. Successful construction of an affordable, multifamily dwelling hinges upon a network of interrelated funding mechanisms, associated borrowing restrictions, tax credits, and development restrictions. The energy crisis of 2000-2001 underscores the connection between affordability and energy efficiency in the pursuit of a comfortable living environment for this under-served market. While residential multifamily construction budgets are primarily influenced by first-cost considerations, ignoring low-cost opportunities to improve energy efficiency disproportionately impacts low-income residents. This paper describes the unique market characteristics, the key market barriers, the difference between efficient and inefficient designs, and some of the unique regulatory barriers to affordable multifamily new construction. These barriers cause an apparent disconnect between affordable housing and energy efficiency. This paper describes programs designed to reconnect energy efficiency to affordability, comfort, and livability. Successful utility-funded design assistance and incentive programs can be crafted to address these unique challenges without causing undue burden upon the owner/developer. This paper describes the design and implementation of two California multifamily new construction utility programs called Designed for Comfort and Home Energy Partnership Program that were created to address needs and barriers in this market and enhance home affordability. Significant features of the programs include: design assistance; assistance to local housing authorities; tax credit training for developers; research to verify efficiency upgrades; and cash incentives.

Introduction

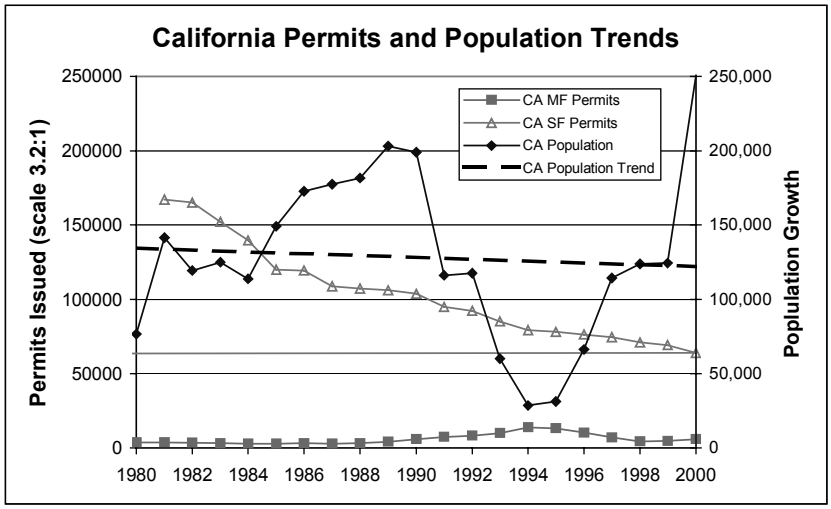
The existing market forces in the affordable housing, new construction market are not sufficiently robust to simultaneously improve the conditions of multifamily housing while keeping costs within the strict budget limits of typical affordable housing developments. Two California multifamily new construction utility programs called ***Designed for Comfort*** and ***Home Energy Partnership Program*** were created to serve this market need. In Program Year (PY) 2001, the former operated in the Southern California Edison service territory and latter operated in the San Diego Gas & Electric service territory. The four largest California investor-owned utilities (IOUs) including Pacific Gas & Electric (PG&E), Southern California Edison (SCE), Southern California Gas (SoCalGas), and San Diego Gas and Electric (SDG&E), are currently working to expand the coverage of these programs across all of the IOU service territories with a common set of program features and goals. The new program will have a different name from either of its predecessors and a common look across the four service territories.

Other energy efficiency programs for the multifamily market target specific technologies such as lighting retrofits, appliance rebates, and procurement programs (Parker 2000). This paper discusses programs that address the needs of the designers and developers of multifamily housing. The emphasis is therefore on the market characteristics, market barriers, and regulatory barriers prior to occupancy.

Market Characteristics

The demand for new multifamily housing in California far outstrips current development rates. Between 1990 and 2000, there was a 9.2% increase in multifamily housing units, but the population of California increased 16.8%. California is below mid-1980's production levels for multifamily units per year put on the market and far below the rate of population growth. (See Figure 1.) Meanwhile, the percentage of the population living below the poverty level rose from 12.5% in 1989 to 14.9% in 2000. In every major metropolitan region of California, there is a waiting list for Section 8 housing vouchers[1]. The California State Department of Housing and Community Development estimates that to meet current demand, homebuilders would have to construct an average of 220,000 additional housing units each year through 2020. Since 1987, new single and multifamily home production combines has averaged just 141,000 units per year.

Figure 1. California Multifamily "MF" (3+ Unit) and Single Family "SF" New Construction Represented by Permits Issued (Unit Growth) Have Not Kept Pace with the California Population Growth



Note: the California population growth is births plus migration minus deaths on a scale of 3.2 to one representing the average number of persons per unit. (US Census Bureau 1999)

[1] A Section 8 housing voucher is provided to a family that meets specific low-income criteria. The voucher entitles the family to a monthly stipend equal to the difference between the actual housing cost (rent plus utilities) and the rent amount that the family is able to afford based upon household income.

For the purpose of this paper, "affordable housing" and "multifamily housing" are synonymous. Nationwide, 11 percent of 1-unit dwellings are occupied by renters while 86.4 percent of 2+ unit dwellings are occupied by renters (United Stated Department of Housing and Urban Development 1999). While not all occupants of multi-unit dwellings are low or moderate income, this convenient terminology is applicable to the California market and is used by the California Department of Housing and Community Development. Goodman provides a more detailed discussion of the demography and diversity of multifamily housing (Goodman 1999).

The Stick

California law (CA Gov. Code Sec. 65580 et seq.) mandates that every local jurisdiction adopt a general plan that includes a "housing element." This provision is not widely implemented or enforced and many local jurisdictions are being fought by various building industry associations and other interest groups. Only sixty-three percent of local jurisdictions have a complying housing element that sets aside enough new residential construction as affordable housing to provide for the growth in low-income and moderate-income housing needs (Dept. of Housing and Community Development 2000). A developer who wishes to make a profit by developing market-rate homes within a complying jurisdiction must first construct the requisite affordable housing units or pay into a trust fund that will tip the financial scales for another development.

The Carrot

The affordable multifamily new construction market now has a carrot to guide its progress in the form of utility incentive programs that help to improve market conditions. In the following section, we identify a number of market barriers and describe how features of a generic utility incentive program for multifamily new construction can address these market needs.

Market Barriers

As discouraging as the market characteristics of multifamily housing may be, the purpose of enumerating them is to provide a background for understanding the significant and very real market barriers to improving the energy efficiency of affordable multifamily dwellings. The predominant market barriers include scheduling constraints, barriers imposed by funding constraints, knowledge/design related barriers, and barriers due to the perception of the cost and value of energy efficiency.

Scheduling Constraints

The design process for affordable multifamily housing projects typically lasts between 18 months and 3 years. The process usually begins with an early emphasis on finding an appropriate site and arranging for the planning review hearing. Grass-roots neighborhood outreach is often used to find support and dissipate any potential animosity toward the project from the surrounding neighborhood (NIMBY attitude). At these early stages of the project, drawings are schematic and the uncertainties are significant. Design

assistance can help the developers site the building, but funding guarantees (or specific efficiency measures) at this point in the process are inappropriate. Once entitlements for the project have been secured, there is often a mad rush to complete design development drawings for submission to the funding agencies. This provides a very small window of opportunity for design assistance and leaves little time for thoughtful design to maximize efficiency and comfort. The on-again, off-again, long-term horizon of affordable housing is a key constraint on the structure of an incentive program.

Tight Lending Criteria vs. Additional Incremental Cost

The currently available sources of funding for affordable housing developments require lengthy application and review procedures. This is often an iterative process following the ebb and flow of funding agencies' budgets and deadlines. This front-loads the project with significant speculative costs associated with designing the project, securing entitlement rights, setting up bridge financing, and obtaining cost estimates for the project without any guarantee that the project will be successfully funded and built.

Once major funding is secured, it can be more difficult to add $500 to a multi-million project than it would be to add $5000 or even $10,000 a month earlier. The developer's project team is frequently unwilling to make any changes that could conceivably risk one of their financing commitments. Contractors are sometimes required to guarantee that they can deliver the project at a fixed price, years in advance of the start of construction. With such long lead times, fluctuations in the price of building materials can wipe out a builder's or developer's profit on the project. Sometimes, as is the case with HUD-financed projects, this means that there is a fixed, invariable price for the project making it appear as though improvements are impossible. Indeed, after materials price increases stemming from years of delays, a builder can justifiably argue that "value engineering" cuts are necessary. Developers and builders alike are therefore very averse to taking any risks that might alter the project scope, schedule or budget.

Risk and Uncertainty of "New" Efficiency Measures

The uncertainty surrounding energy efficiency alternatives to conventional construction practices often prevent owners, developers, builders and design professionals from making any significant changes to their customary design practices. The recent history of energy efficiency and "conservation" measures is rife with examples of poor product performance, poorly understood product integration design requirements, and outright product failures. Notable examples include the first electronic ballast and solar water heating systems of the seventies and early eighties. Untried products can result in costly "call-backs" and lawsuits further reinforcing an environment of already risk-averse design professionals. Until products are sufficiently tested and studied, and have proven track records, builders steer away from them. These "unproven" products or design methodologies are perceived as unnecessary and unwarranted risks. For example, an air conditioning system size can be reduced if the builder installs high-performance glass that reduces the cooling load. Citing that they don't want to risk callbacks, builders feel safer taking the approach that more (bigger HVAC system) is better for the consumer.

New products sometimes are associated with unreliable availability and delivery delays. Time delays can be even many times more costly to the project than any efficiency measure might possibly save. Integrating a new technology into the design process requires willingness on the part of the design team to spend time understanding any implications the new technology might have on other building elements. All of these factors create a barrier to energy efficiency that would-be early adopters are loath to experience without some kind of external motivation, financial incentive, or both.

However, energy efficiency is not only about "new" products, it is about thoughtful, high performance and value-based design. This reluctance to try new energy efficiency approaches (products or design) presents a significant challenge for multifamily design incentive programs. The very nature of a design assistance program requires the willingness of the design team to listen to the advice of an "expert" in energy efficiency who has little liability for the success of the project itself. The design team and owner/developer want hard evidence of the success of efficiency measures, warrantees of the longevity of the equipment, and reassurances that the design alterations will not delay the construction schedule. Here again, the implementers of design incentive programs have an essential role to play as information gatherers, efficiency "evangelists," and all-purpose translators between the scientific literature and the construction industry.

Complex Coordination of the Design Team

The design team for a multifamily dwelling includes a variety of design professionals and specialized consultants with the owner/developer acting as the chief executive officer and chairman of the board, but sometimes this authority is delegated to the architect or builder/contractor. Regardless of who is in charge, the money flows from the top down. Design assistance implementers must nurture a relationship of mutual trust between each design professional. The program incentive structure must carefully avoid causing conflicts of interests or the appearance that the owner/developer does not hold the final authority. If the design team already includes an energy consultant, the incentive program implementers face a particularly challenging situation to present themselves as assistants to the team—not as competitors. If the energy consultant earns some fees through providing energy calculation results, then the program administrator must be sensitive to this and not threaten the livelihood and standing of this essential member of the team. The architect is often the coordinator of all the design professionals. In this case the architect must be the contact and conduit for any new information, especially if the information has the potential to undermine the credibility of another design professional on the team. Conflicts of interest can be avoided by structuring the incentive payments to flow through the owner/developer, even when the funds are intended for the design team.

Design Cost Constraints

Design professionals for affordable housing projects work under extremely tight budget constraints. Developers of affordable housing are often non-profit agencies because of the significant tax breaks provided to these corporate entities. These non-profit developers are not likely to finance costly building modifications. Even increases

in fees for design modifications are difficult to justify. Fortunately, these organizations usually also carry with them a corporate culture of social responsibility. As long as there are clearly documented benefits to the tenant or developer, and there are minimal cost and schedule implications, they are willing to consider efficiency alternatives. Nevertheless, many non-profit housing developers lack up-to-date design expertise and may be reluctant to challenge the assumptions of their design team. With such thin profit margins and in the absence of utility programs that help defray some of this cost of "continuing education," designers of affordable housing have little incentive to expand their design knowledge or embrace newer technologies and practices.

Value Engineering

Most building projects have a "value engineering" phase just prior to the start of construction when the contractor submits proposals to the owner and architect for cost-saving alternatives.[2] Energy efficiency features, in particular, are seen as a costly building enhancement with little if any direct benefit to the owner/developer and are often cut out of the design. However, the value-engineering phase also presents the opportunity for the architect to submit proposals for no-net-cost design changes or exchanges of specified materials. This is the opportunity for a wise developer to upgrade the building systems to take advantage of newer equipment and materials with higher efficiencies and equivalent (if not lower) prices. This point in time also represents an important window of opportunity for utility incentive programs to reap rapid rewards.

Lack of Integration of the Design Disciplines

Designing large buildings or projects is often done piecemeal by each of the subject area experts: mechanical engineer, architect, lighting designer, etc., rather than as an integrated design processes. Integration allows for significantly more savings at lower cost. Part of the problem is that there is a lack of cross-disciplinary knowledge and experience in modeling energy efficiency into new projects. The State of California mandates that all new buildings meet a set of minimum energy efficiency standards known as Title 24 (California Energy Commission 2001). A cottage industry has emerged to provide what is often viewed as perfunctory documentation of compliance. Thus, many builders and architects rely solely on their Title 24 consultant to produce the proper documentation to submit for permitting and may not even review the documents prior to submittal. In turn, Title 24 consultants usually do not seek to influence the project design or to actively encourage energy efficiency, improved comfort, and added value. When the mechanical engineer is asked to advise on energy efficiency measures and to produce the Title 24 documentation, there are financial disincentive to proposing some cost effective measures such as reducing cooling capacity when high performance glazing has reduced building solar gains. There is a definite lack of expertise in how to correctly model complex multifamily high-rise projects and an unwillingness to promote efficient alternatives.

[2] Often there is another value engineering phase as the end of construction approaches and the budget is nearly exhausted, however the opportunities are obviously much more limited.

Energy Efficiency and Property Values

Building energy-efficiency features have the potential to influence property values for multifamily developments. Energy efficiency upgrades that reduce the owner's operating expenses[3] translate directly into greater net monthly income available for other purposes such as paying off construction loans sooner and/or greater profits. The property values of energy efficient developments should likewise increase more rapidly. However, the affordable housing market doesn't normally recognize the relationship between reduced operating expenses and higher property values when evaluating a project to be built. The connection does occur once there are a few years of operating expenses to analyze. A utility incentive program can provide this valuable information to the project team from reliable sources.

Still, the value of energy efficiency improvements that affect the tenants' bills are largely ignored in assessing property values. In a vibrant housing market tenant, preferences for energy efficiency and comfort should result in varying vacancy rates which in turn would affect property values. However, it is so difficult for tenants to compare the relative energy efficiency of two different apartments before occupancy, they would not likely reveal a strong preference for energy efficiency over other more tangible building features.

Supposing for a moment that energy cost was of foremost concern and easy to discern, would this alone drive the market toward higher efficiency? Unfortunately, this is not the case because of the short supply of affordable housing. Vacancy rates are below 5% for most of California, below 2% for most urban areas. Subsidized rental housing in much of California has a waiting list of families that is longer than the total number of units on each county's rolls. The scarcity of affordable housing means that residents don't have the chance to select a more energy efficient apartment over another, less efficient one.

Consumer Perception and Value of Energy Efficiency

Builders have the perception that energy efficiency is not important to homebuyers/renters. With price volatility in the California energy market, efficiency is becoming increasingly valuable to the affordable housing consumer. Yet, builders' skepticism is appropriate insofar as the importance of energy efficiency is viewed primarily in terms of dollars. Renters often pay such a small energy bill that the marginal savings for a 15% efficiency improvement are less than $10/month. It is more likely that renters might place a higher value on the comfort improvements that efficiency means if the connection between energy efficiency and comfort was a more widely understood phenomenon. The value of energy efficiency is much greater for low-income residents. The average median-income household spends 4.6% of its income on energy while the average low-income household spends 19.5% (National Low-income Energy Consortium, et. al. 2001). Through public outreach activities, a utility incentive program

[3] For example, controls on a domestic hot water recirculation loop for an apartment building where the owner supplies the hot water and pays the gas bill for the building complex, increase the owner's net monthly income.

can educate tenants about energy efficiency features to look for in their next housing decision.

Regulatory Barriers

The regulatory landscape surrounding affordable housing is fraught with complexity. Like any other type of construction, multifamily development projects must deal with many layers of entitlement issues, environmental impact reports, environmental remediation, flood control regulations, and a multitude of other regulations. In addition, the funding sources available to affordable housing projects have an additional layer of rules and regulations nearly as thick, and are subject to regular and enduring scrutiny for continuing compliance. The market barriers to energy efficiency in multifamily housing are exacerbated by some regulations that fail to provide sufficient and appropriate incentives for energy efficiency and other regulations that inadvertently discourage the consideration of energy efficiency in affordable housing.

State and Federal Tax Code

Federal and State and tax codes provide significant benefits to the developers of affordable rental housing through the administration of the Federal Low Income Tax Credit (LITC), the state tax credit allocations, and through the issuance of tax exempt development bonds. The Federal low-income tax credit is documented in 40 pages of 10-point type. Although complex, this federal program is responsible for the development of 56,000 rental units per year nation wide by allowing equity partners in the development to depreciate the assets of multifamily property at an accelerated rate. Funding for the LITC has been the subject of many debates in Congress since its inception in 1986. Funding had been subject to short-term sunset provisions and has been suspended on several occasions. A "permanent" extension to the program was approved by Congress in 1993, however a bill submitted by Sen. Bill Archer (R-TX) in 1995 would have ended funding for this successful program in 1997, had the bill not been vetoed by President Clinton. Needless to say, the long-term horizon and security of funding for affordable housing has suffered from this short term view and volatility of the program funding.

In California, the Tax Credit Allocation Committee (TCAC) administers the Federal LITC tax credit program as well as a state-funded tax credit program that supplements the Federal program and follows similar guidelines. Obtaining the tax credit depends upon successful acceptance of an extensive proposal to the TCAC involving a detailed business plan with funding sources. The application process takes 75 days and the regulations have strict deadlines for completion of the project. The HUD guidelines are often vague and yet have effective veto power over the project through its control of the budget process. To determine which projects are awarded a tax credit and how much the credit is worth, all proposals are ranked (scored) by a number of factors including the energy efficiency of the project. The process awards points to projects that are at least 15% better than California's Title 24 Building Energy Standards. Additional points are awarded if other energy efficiency measures (e.g., Compact Fluorescent Lighting and ENERGY STAR appliances) are included. Additional funding is made available to winning projects that exceed the state Building Energy Standards by at least 25%. While this program seems to encourage energy efficient designs, there is a general lack of

knowledge within the design community about the nature of these credits and particularly how to achieve the efficiency levels. Here again, utility incentive programs can help with training on how to complete the TCAC application with emphasis on the role of energy efficiency, and can offer third-party verification of the claimed efficiency enhancements.

Focus on First Cost as Determinant of Affordability

State guidelines administered by the California State Department of Housing and Community Development (HCD) until very recently dictated that the only indicator of affordability was the first cost of the dwelling. This put undue pressure on the developer who is already concerned about construction costs, to meet these unrealistic and counter-productive affordability standards. It is very difficult to both provide substantial building efficiency upgrades and be competitive with other project proposals when the cost savings to the tenants is not included in the awarding of HCD assistance. Just last year, HCD officially changed its point of view to give equal importance to the utility cost portion of the affordability index.

State Building Standards Structure

The complexity of the California Title 24 Building Energy Standard adds further confusion. The code treats low-rise (3 stories or less) and hi-rise (4 or more stories) buildings very differently. The code includes two ways of complying with the standards: a prescriptive list of minimum measures and a performance (computer simulation) based approach. Many builders perceive that the energy code is just another regulatory hurdle and costly barrier to providing affordable housing. There is the misconception that a building that passes Title 24 is somehow a high-performance building.

In fact, there are numerous loopholes and easy trade-offs between building components that allow an inefficient multifamily building to qualify. In particular, the water-heating budget calculation for a multifamily dwelling is the same as for a single-family unit, and domestic hot water distribution losses associated with central boiler systems are not correctly accounted for in the calculations. Another failing of the building standards for multifamily dwellings is the fact that the allowable window area for low-rise projects is the same as for single family homes, 16 percent or 20 percent depending upon location (climate zone). However, it is very unusual that a multifamily dwelling will be built with a window area ratio greater than 8-10 percent. These two loopholes allow multifamily buildings to trade-off these artificial "savings" for drastic reductions in the efficiency of the envelope or space heating and cooling systems.

These deficiencies in the multifamily Title 24 standards are not well known and many builders truly believe that complying with the minimal level of the energy code bestows upon the project a status of high efficiency. This misconception presents a barrier to energy efficient construction practices because it removes any motivation to challenge the design team to do any better. The artificially low efficiency benchmark for multifamily construction makes the barrier to energy efficiency worse by creating the perception that enormous effort is required to achieve significant efficiency improvements. It is often quite eye opening to share with the design team the alternative point of view that Title 24 defines the "worst building you are legally allowed to build in California."

Building Standards Codify Current Construction Practices

Without any design documents specifying greater than minimum efficiency, contractor bids will assume minimum efficiency levels. When developers are faced with a choice between two bids for the same project, it takes sophisticated knowledge of energy efficiency to evaluate the relative performance merits of the various proposals. Title 24 and its associated compliance tools are an effective benchmark for comparing the relative efficiency of one design solution over another, but a qualified energy specialist is required to deal with the complexities of most multifamily construction projects.

Local NIMBY Influence

Often the proposed site for a new multifamily dwelling will be land that had previously been zoned for lower density. Local planning agencies have the authority to grant variances to the local planning guidelines and General Plan for the incorporated areas of the city. Affordable housing carries with it a stigma associated with prior failed attempts to provide adequate living environments. Even if the planning commission is open-minded about affordable housing, fervent opposition from a group of unhappy neighbors can easily defeat the efforts of a well-intentioned developer.

This "NIMBY" attitude can be legitimized by the entire community's attitude toward affordable housing, and its selection of political leaders. The City of Folsom, California for example, failed to implement its required 20% allotment of affordable housing for many years. In response to a lawsuit filed by affordable housing advocates, Superior Court Judge Lloyd Connelly recently froze all construction within the city limits for one week "until [the city] come[s] into compliance with what they're obligated to do under state law" (Hecht 2001). Attitudes such as these on the local level add to the difficulty of developing affordable multifamily dwellings. The "solution" many California jurisdictions have adopted is to meet their entire affordable housing requirement with qualifying senior housing. This approach is largely unchallenged and spreading rapidly.

Inconsistent State (CPUC) Direction

Utility incentive programs must operate within a regulatory framework that poses barriers to the success of the programs. Inconsistent direction from the CPUC on how energy efficiency funds should be spent has done a disservice to the affordable housing market on several different levels. First, the constantly changing direction reduces the cost-effectiveness of the programs because of start-up costs associated with each new iteration. These costs are worse when major changes in direction are ordered, but are still significant when programs have to stop and then restart again even if the direction is largely the same. This starting and stopping makes it difficult and expensive for the developers to have consistent plans and operations that include the program design assistance and monetary incentives. Second, the CPUC does not believe that funds should be spent on energy efficiency for master-metered (for electricity) projects because the tenants do not pay the energy bills and therefore, have no impetus to conserve. For many types of multifamily dwellings it does not make monetary or practical sense for the residents to have separate electric meters. This direction has left many non-profit and/or

publicly-funded assisted living, senior, single room occupancies (SRO), and other master-metered housing under served by Public Goods Charge (PGC) funds. The net impact on the broad multifamily market is an increase of funds available to the for-profit production builders, and a decrease of funds available to the non-profit developers. Third, the CPUC does not allow a single project to benefit from a mix of funds from different program target areas. As of PY2002, appliance program funds cannot be spent to encourage the installation of efficient appliances in residential new construction; and residential new construction funds can not be spent on appliances covered by the appliance programs. These CPUC policies and/or direction do not serve the affordable multifamily new construction housing market well.

The CPUC policy decision that will perhaps prove to be the most devastating to the effectiveness of utility multifamily energy efficiency programs is about to be implemented. Utility earnings claims will no longer be used to motivate IOUs to make sure their programs are effective. In the late 1980s, California adopted the earnings claim structure for programs due to a realization that it was unreasonable to expect that utilities would seek real energy savings unless they were allowed to make a profit on a par with the profit they can make by selling energy. Now that that motivator has been removed, the CPUC is back to simply commanding the IOUs to have programs. Historical experience strongly suggests that budgets will decline and program dollars spent will be focused on producing more customer-utility loyalty than real energy efficiency. This was the experience of earlier incentive programs before the earnings claims structure was first instituted.

Contradictory Utility Incentive Program Structure

A well-intentioned utility incentive program designed to address a market or regulatory barrier can do more harm than good if the program requires the design team to accept a new technology that is either inappropriate or not ready for the marketplace. For example, one utility program serving a mild, arid climate in PY2001 offers an incentive if the project improves the efficiency of its air conditioning ducts and implements four items from a list of six other efficiency upgrades. Two of the items on the list are simply inappropriate for multifamily construction in this climate, (e.g., a gas-fired air conditioner), and surprisingly, none of the other options addresses improvements in the building envelope. Gas-fired air conditioners are typically not cost effective until they are above 10 tons in capacity. Most multifamily construction in this area utilizes split systems with one A/C system of minimum capacity (1.5 tons) per unit. The other four options include installing a gas clothes dryer and a gas stovetop and oven, installing a gas water heater (of minimum efficiency), providing a gas spigot at the fireplace, and providing a gas spigot on the balcony or deck for a gas barbecue. It is questionable whether these alternatives result in any efficiency improvements. At worst, the fireplace spigot requirement might decrease the energy efficiency of the home by requiring that the builder provide a fireplace that will inevitably cause additional exfiltration losses through a leaky chimney flue damper. A more effective incentive program would require easily achievable building upgrades and promote reasonable upgrade options that do not have the possible side effect of reducing overall building energy efficiency and building load for the utility company sponsoring the program.

Solutions

SDG&E initiated the first multifamily energy efficiency new construction program in California through a third-party pilot program called ***Designed for Comfort*** **(DfC)** which was later named ***Home Energy Partnership Program (HEPP)***. Southern California Edison was the second utility to adopt ***Designed for Comfort*** as a third-party pilot program in early 2001. Out of these efforts emerged a recognition of the need to serve the affordable multifamily new construction market. While the basic structure and concepts for these two programs are similar, they vary slightly to reflect the local markets they serve.

Designed for Comfort (2001 Program Year)

Southern California Edison adopted ***DfC*** with an initial pilot area in San Bernardino and Riverside Counties and a limited incentive budget. Outreach efforts included workshops on the benefits of the program advertised to the local housing developers, particularly non-profit agencies. The program incentive budget was fully subscribed during the first workshop. The program was infused with additional incentive money and the project scope expanded to the rest of the counties in the SCE territory. Subsequent outreach activities included visiting architects and developers who specialize in affordable housing developments.

Designed for Comfort strongly emphasizes the importance of early involvement in the project to maximize the potential benefits of design assistance. The program requires the building to us 15% less energy than Title 24 allows and be no worse than the prescriptive minimum requirements of Title 24 "Package D". It also requires that at least two items be upgraded, only one of which may be a domestic hot water heating improvement. This cost effectively eliminates trade-offs between the envelope and domestic water heating budgets and fills-in the gaps in the current version of the Title 24 multifamily building standards. The program also requires other PUC-mandated measures such as individual electric meters for each unit and does not offer direct incentives for appliance and lighting upgrades. However, the project team may be referred to the appropriate contact at SCE to take advantage of ***Savings by Design*** incentives for the non-residential parts (e.g. common areas) of the project when appropriate.

Designed for Comfort has also been successful with its Two-Tiered Utility Allowance assistance. This aspect of the program involves assisting the local housing authorities to implement a modified utility allowance schedule that recognizes the benefits of multifamily dwellings with greater energy efficiency. The utility allowance may have one tier applicable to the "standard" building stock in the region and another tier for buildings that are demonstrated to use at least 15% less energy for heating, cooling and water heating than allowed by Title 24. The Utility Allowance is that part of the housing burden which is attributable to the cost of the utilities. The amount of rent that a developer is allowed to charge rent-assisted tenants is the difference between a predefined housing burden (calculated based on a percentage of the mean income in the region) and the utility allowance. Thus, if the utility allowance is smaller, the developer can collect more rent. The program as presented to the local housing authorities proposes to allow developers to collect more rent (three quarters of the utility savings) for the first

four years of the project. Thereafter, the full savings are passed onto the tenant by resetting the rent to what it would have been with the "standard" utility allowance. Thus, the Two-Tier Utility Allowance provides the developer with a mechanism to recoup its investment in the building efficiency upgrades. ***DfC*** successfully promoted the Two-Tiered Utility Allowance with the County of San Bernardino Housing Authority (in late 2000, they adopted a revised utility allowance structure) and is assisting Ventura, Riverside and San Diego counties in their consideration of it.

Designed for Comfort also provides consultation and advice on the best approach to the Tax Credit Allocation Committee (TCAC) applications. Affordable housing developers that are able to demonstrate that their buildings are 15% above Title 24 minimum requirements are awarded extra "points" which improve the scoring of their application. There are additional scoring points if the developer installs ENERGY STAR appliances and compact fluorescent lighting. Developers can qualify for higher tax credits by demonstrating a 25% improvement over Title 24 ***DfC*** can offer provide the developer with a letter showing third-party verification of the proposed energy efficiency improvements.

Finally, ***DfC*** offers cash incentives for all projects that successfully implement the energy efficiency enhancements that are necessary to achieve 15% above Title 24. Funds are reserved only after the developer provides the program with a building permit (or other satisfactory proof of intent) showing the higher energy efficiency design. No funds are disbursed until after the site is inspected by ***DfC*** staff and verified to be in compliance with the stated goals. For PY2001, there is a design team incentive and a per-unit developer incentive. The design team incentive is $250.00 per unique floor plan with a minimum of $750.00 and a maximum of $2000.00. The developer incentive is $100.00 per unit of the project. For PY 2001, incentive dollars are capped at $25,000.00 per project. At the time of the writing of this paper, the ongoing funding of ***DfC*** into PY 2002 is uncertain due to the statewide plans for a coordinated multifamily new construction program.

Home Energy Partnership Program (2001 Program Year)

SDG&E's **Home Energy Partnership Program (HEPP)** provides benefits to developers of both rental and for-sale residential projects. It specifically targets affordable, senior and special needs housing and works with various local agencies to further this goal.

The **HEPP** provides incentives and benefits to single family and multifamily home builders to design and build the envelope of new homes to reach a performance-based thresholds of 15% more efficient than required by code (2001 Title 24). For projects which achieve this performance goal as demonstrated with Title 24 computer simulations, the multifamily element of the Home Energy Partnership Program in PY2001 offers a rebate of $200.00 per unit split 80-20 between the developer and design team.

HEPP also offers design assistance involving a review of the project architectural plans and Title 24 model. Program staff assist builders with selecting the most cost-effective energy-efficiency options appropriate for each project. A feature of **HEPP** not offered in **DfC** in the 2001 program year for SCE is project design charettes. This cross-

disciplinary meeting help to clarify the project team's energy efficiency goals by maximize the chances of a successful integrated design approach by identifying and resolving any barriers between project team members. Charettes can involve modeling various design scenarios, education on the implications of energy efficiency goals, refining bid specifications.

While the program emphasizes the energy efficiency of the building components and provides cash incentives to offset these costs, the program also takes a "whole house" approach by also encouraging the installation of ENERGY STAR appliances, and lighting fixtures. In addition, the program staff connects the project team with other efficiency programs where appropriate.

Once an affordable, senior, or special needs housing project is built, the CARE[4] program is alerted to ensure that each tenant is aware of the discount rate structure and other low-income program opportunities. Tenants also receive a consumer packet that contains information on how to further reduce energy use along with a compact fluorescent light bulb. In PY2001, follow up inspections were performed on 15% of projects to verify program compliance.

HEPP encourages builders to go beyond the envelope of the house and take a whole house approach by installing or offering energy efficient appliances. Builders could take advantage of the appliance incentives either by installing ENERGY STAR-qualified appliance with a wholesale-based rebate or by offering ENERGY STAR appliances as an upgrade option through a local dealer allowing the homeowner to qualify for the rebate. These rebates range from $50.00 to $215.00 depending upon the type of appliance and the rebate approach. HEPP also offers incentive for the installation of fluorescent lighting technologies in kitchens, bathrooms, utility rooms, garage and outdoor applications.

The HEPP program offers a series of free training courses for homebuilders, developers, contractors, sales agents and other industry professionals. Topics include modeling of building energy performance, energy-efficient design of heating, ventilating and air-conditioning systems, high-performance window technologies, energy code compliance for builders, energy code specifics for building officials, and, for sales agents, an overview of residential energy-efficiency technologies and programs.

Program Results

Since its inception in the fall of 2000, both DfC and HEPP have gained significant momentum and delivered proven successes. According to the San Diego Association of Governments, between 1999 and 2004, 16,630 extremely low-, very low-, or low-income homes are planned for either new construction or major rehabilitation in San Diego County. This averages out to about 2771 affordable units each year. In PY 2001, total housing starts in the region totaled 15,634 (6,087 multi-family and 9,547 single-family). The affordable housing market accounts for approximately 18% of the total market share.

In these markets, HEPP participation reached 30% (2508 units) of the multifamily market, and 42% (1128) of the affordable housing market. The project retention rates have been exceptionally high, with little or no project "drop out" rates.

[4] The California Alternate Rates for Energy program provides a 20 percent discount on utility rates for income-qualified California residents. http://www.sce.com/NR/sc3/tm2/pdf/1525-E.pdf

Designed for Comfort operated successfully allocated 100% of the available incentive funds in the first 6 months of the program. The program area is much larger than HEPP and its incentive budget much smaller. Two projects are scheduled for completion by the middle of 2002. Efficiency improvements on these two projects are 15% better than 2001 Title 24. Both projects started out with building permits showing marginal compliance under the 1998 buildings standards.

Conclusion

Successful utility-funded design assistance and incentive programs intended to meet the needs of affordable housing must be crafted to address the unique challenges facing the multifamily new construction market. The role of utility incentive programs in the mix of funding sources is to leverage a small cash incentive along with design assistance to connect the needs of the consumers back to the decision making point in the development process. Other market barriers are best addressed through outreach, training and promotional activities.

Future Work and Beyond HEPP and *DfC*

While these programs were pioneering and identified a market that was thirsty to be served, the CPUC directed the utilities to design and implement a coordinated statewide residential new construction program at a much-reduced budget and scale. In their proposal, the utilities requested funding for the homes portion only (single- and multifamily) and because other appliance and lighting programs were adopted statewide, these elements were not considered in the statewide residential program. Largely because of the success of these programs, the CPUC designated that 20% of all program funding be reserved for hard to reach markets including the affordable housing sector.

Possibly the biggest area needed for future research is to determine effective ways of demonstrating the impact of energy efficiency on property value. If successful, this can provide concrete evidence to both affordable and market rate developers to incorporate more efficiency measures. Current consumer attitudes indicate that most tenants would rather drive 30 minutes further in their commute than pay an extra $50.00 per month in rent. If efficiency upgrades exceed the market rates for similar units, it is unlikely that a purely financial incentive will ever be successful at transforming the multifamily new construction market toward energy efficiency.

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