A pilot program to encourage construction of affordable and sustainable housing in New Jersey

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Abstract

One aspect of sustainable development involves improving home construction to maximize energy conservation and protect the environment. But environmentally friendly innovations can add to construction costs and make these units too expensive for low-income residents to buy or rent. The challenge is to keep such homes both sustainable and affordable. In the late 1990s, the New Jersey Department of Community Affairs (DCA) and PSE&G, the state’s largest utility company, launched a pilot program to build affordable housing that serves low- and moderate-income residents but also serves vital goals of sustainable housing. Projects selected for state funding incorporate several key sustainable strategies, such as reducing dependence on automobiles, recycling materials at the job site, installing low-flow water fixtures, and selecting interior finishes for health, durability, and environmental responsibility. Equally important, the housing units are designed to meet or exceed the U.S. Environmental Protection Agency’s Energy Star level of energy efficiency. Through a combination of insulation, air sealing, ventilation, and properly sized heating plants, they are at least 30 percent more energy-efficient than standard new housing. The immediate result was hundreds of units built through a $15 million state investment. The program also achieved its long-term goal of market transformation in 2001 when K. Hovnanian Companies, New Jersey’s largest home builder, announced its commitment to meet voluntary New Jersey Energy Star Program (an EPA-backed program) standards in every new home it builds in the state.
1 Background

Suburban sprawl has been rampant in the state of New Jersey over the past half-century, gobbling up open space across the state, including half of all farmland, and putting a strain on natural resources and the environment. New Jersey has the United States' ninth largest population, with 8.4 million people, and is the most densely populated, but is truly suburban. It does not have a major city, one that ranks among the 60 most populous American cities. As the population continues to grow, New Jersey faces the prospect of becoming the first state in the nation to be "built out"—to run out of room for new development [1].

To slow sprawl and control growth, New Jersey state government produced a State Development and Redevelopment Plan, which was adopted in 1992. The plan grew out of a process that began with the 1985 passage of the State Planning Act (N.J.S.A. 52:18A-196 et seq.), whose goals for New Jersey were to "conserve its natural resources, revitalize its urban centers, protect the quality of its environment, and provide needed housing and adequate public services at a reasonable cost while promoting beneficial economic growth, development, and renewal..." The executive agency charged with overseeing the plan's implementation is the New Jersey Department of Community Affairs (DCA).

One of 16 Cabinet-level executive agencies in New Jersey state government, DCA has an annual budget of approximately $1 billion (out of a $23 billion state budget) and employs a staff of 1,500 people. DCA has five divisions, including local government services, codes and standards, fire safety, housing and community resources, and women's advocacy.

Through its housing and local government programs, DCA also serves the commitment of state government to the New Jersey State Supreme Court's Mt. Laurel rulings of 1975 and 1983, which require all municipalities to provide their fair share of affordable housing. DCA's Balanced Housing Program provides funding to municipalities to create housing affordable to low- and moderate-income households. An affiliate organization of DCA is the New Jersey Housing and Mortgage Finance Agency, whose mission is to finance the production of affordable housing in the state.

In the 1990s, New Jersey state government faced the challenge of encouraging the production of affordable housing while preventing sprawl and protecting the environment. In Governor Christine Todd Whitman's inaugural address beginning her second four-year term in 1998, she called upon the state to build a "sustainable society ... in which we protect the resources we have today so they are there for us tomorrow" [2].

Answering the Governor's call, DCA sought to combine its mission to encourage affordable housing with a commitment to environmental protection and "sustainability." The vehicle was a pilot program that would spark the creation of affordable housing that was also "sustainable"—conserving energy and minimizing harmful effects on the environment.

DCA found a willing partner in Public Service Electric & Gas (PSE&G), the state's largest utility. Both sides stood to benefit from sharing responsibility for the
pilot program – DCA to gain more units of affordable housing while protecting the environment, and PSE&G to ease the burden on its power plants from new energy users, avoiding the need to build a costly new plant.

2 The pilot program

In collaboration with PSE&G, DCA launched the Sustainable Development/Affordable Housing Pilot Program in November 1998. The U.S. Environmental Protection Agency (EPA), the New Jersey Housing and Mortgage Finance Agency, the New Jersey Department of Environmental Protection, and State Energy Office, and the New Jersey Commerce and Economic Growth Commission also cooperated in the initiative.

The purpose of the pilot program was to identify replicable, affordable strategies that a public subsidy program can employ to incorporate sustainable design principles, including energy efficiency, into the production of housing for low- and moderate-income households. In addition to reduced impact on the environment due to greater energy efficiency, the economic benefits of this housing are anticipated to outweigh the higher initial costs, as the units will incur lower utility and maintenance costs and are constructed of more durable materials.

In its request for proposals, supplemented by workshops around the state, DCA solicited designs that incorporated sustainable development criteria. The agency stressed that such housing units must also be affordable, able to be produced with reasonable public subsidy, and – in the long run – to be widely replicable by affordable-housing developers. DCA sought proposals for projects of five to 50 units (with larger projects permissible) in municipalities that were eligible to apply for DCA Balanced Housing funds and in which PSE&G supplied both gas and electric service. DCA anticipated including at least one urban and one suburban project among those it funded.

Applicants selected after a two-phase selection process were to receive subsidy through DCA’s Balanced Housing Program, which set aside up to $10 million, enough funding to produce up to 100 units. The New Jersey Housing and Mortgage Finance Agency committed $5 million from an existing mortgage program to for-sale homes produced through this pilot program; this commitment was expected to provide mortgages for 60 to 70 homes at 5% interest with zero points. In addition, PSE&G would provide financial incentives through its Energy Efficient Home Five-Star Program (based on EPA’s Energy Star Program) to offset the incremental costs of energy efficiency upgrades [3].

As spelled out below, the pilot program sought to fund housing that is affordable, highly energy-efficient, and meets sustainable development criteria.

2.1 Affordability

Affordable housing was defined as housing that an eligible household could afford without undue burden. The occupants of rental units would pay approximately 30% of their income for rent and utilities and homeowners would pay approximately 28%
of their income for principal and interest on a mortgage, taxes, and insurance. The housing would be occupied by households with gross annual income below 80% of the median gross annual income – and a portion of rental housing was to be occupied by households below 50% of the median gross annual income. The housing units would remain affordable for a set number of years (10 in municipalities receiving urban aid from the state and 30 in all other municipalities).

2.2 Energy efficiency

DCA established the definition of energy efficiency under the pilot program as using at least 30% less energy for heating, cooling, and water heating than a home meeting the standards of the 1993 Model Energy Code of the Council of American Building Officials. This level was chosen because it conformed with the level set by the U.S. Environmental Protection Agency for its “Energy Star Home” Program and by PSE&G for its Five-Star Program.

As part of the pilot program evaluation, DCA and PSE&G would monitor construction, energy consumption, and durability of the units for five years after each was occupied.

2.3 Sustainability

DCA defined its sustainable development criteria as sound land-use planning, minimal impact on the environment, conservation of natural resources, production of durable and low-maintenance structures, optimal use of existing infrastructure, and superior building design that enhances the health, safety, and well-being of the residents. In a separate document sent out with its request for proposals, DCA enumerated specific strategies for achieving the program goals. These strategies included providing responsible storm water management (such as by minimizing impervious ground coverings), clustering buildings to promote a sense of community and to encourage appreciation of the natural landscape, choosing long-lasting exterior finish materials, minimizing job-site waste, employing rooftop solar water heating, designing water-efficient landscaping, building foundations to minimize soil gas entry, and educating occupants about how the house works and how best to maintain it.

2.4 Other factors

DCA’s request for proposals stated that proposed projects should be replicable and based on market-ready technologies. It also specified that there be no impediments to construction, such as zoning, environmental, or historic-site requirements that could not be met. For the purposes of replication, DCA declared that it would favor applications in which the development teams were willing to document their decision-making process [4].
3 Selection process

In April 1999, DCA received 10 proposals in the initial phase of the selection process, requesting $9.7 million of Balanced Housing funds and proposing 572 units, of which 549 were affordable. Reviewing the applications was a review team comprising two energy consultants hired by PSE&G, a professional planner, the director of the New Jersey Institute of Technology’s Center for Architectural and Building Science Research, and representatives of the state Sustainable Business Office and the DCA Division of Codes and Standards, as well as the pilot program’s director. While nine of the 10 proposed projects were chosen to compete in the second phase, all lacked adequate detail, especially in sustainable design strategies, and needed substantial and time-consuming changes. The pilot project review team decided to require an experienced sustainable design consultant on each development team and provided $10,000 per team for this purpose, while also providing a financial incentive of $2,000 per unit to cover needed changes. In addition, DCA announced that because the remaining proposals had varying timelines for completion, it would have enough money to fund all of the projects over a multi-year period. At the same time, DCA determined that all projects funded through the pilot program would at least have to meet certain specifications: recycling of job-site debris; retention of existing trees if possible; use of roof shingles carrying a 25-year warranty; and avoidance of vinyl siding and vinyl windows (although in consideration of cost, vinyl-clad wood would be allowed).

DCA and the review team provided technical assistance to the nine development teams during the summer of 1999, including an energy analysis report for each unit by PSE&G consultant MaGrann Associates to ensure that the developers complied with PSE&G’s Five-Star Program during the construction period. In early August the pilot program was selected as a demonstration under the Partnership for Advancing Technology in Housing (PATH), a public/private initiative administered by the U.S. Department of Housing and Urban Development (HUD). HUD designated Steven Winter Associates of Connecticut to provide the pilot participants with energy-use and cost/benefit analysis and other technical assistance, such as researching the cost and availability of sustainable products (windows, insulation, appliances, etc.).

Receiving all submissions by the August 20, 1999 deadline for the second phase, the review team continued to seek more detail, especially regarding budget requirements for each sustainable element. In September 1999, the review team sent all participants a comprehensive list of items that must be included for the project to meet the pilot standards. Among the requirements were: 1.6 gallon-per-minute showerheads; ABS drain piping instead of PVC for waste pipes; Energy Star appliances; zero formaldehyde cabinet material or sealing the cabinets with an impermeable finish; and energy-efficient lighting.

In October 1999, DCA and PSE&G announced that eight projects totaling 422 units had been selected as winners, and deemed four of them “exemplary projects that will serve as a model for future affordable housing in New Jersey.” All but one of the projects were located in urban areas, and three planned to reclaim
environmentally damaged sites. The projects were located close to public transportation and services, minimizing the need for automobile use. Two of the projects were sponsored by nonprofit housing developers, the remainder by for-profit companies.

In a letter to each winner, DCA informed the developers that release of funds would be contingent on 1) meeting the requirements of the Balanced Housing Program, which would include demonstrating the feasibility of the project through attainment of all necessary funding; and 2) meeting the commitment to incorporate the sustainable features to which each had specifically agreed. The letter also stipulated that the review team would negotiate with each developer the final list of sustainable components to be installed (and subsidized) and make that list part of the Balanced Housing Grant Agreement, a legal document. These negotiations enabled DCA to limit the costs attributed to the pilot program requirements to $7,000-$8,000 per unit, a range that can reasonably be absorbed by existing subsidy programs [5].

4 Case study: West Side Village

West Side Village in Newark, developed by RPM Development Company, was the first pilot project to receive funds and the first to reach completion. One of the pilot’s four “exemplary projects,” West Side Village included two buildings, one newly constructed and one a converted factory, both completed and occupied in 2000. Its 128 very low-income apartments include 21 three-bedroom units, 83 two-bedroom units, 22 one-bedroom units, and two efficiencies. The total cost of sustainable items, including energy-efficient items to meet the requirements of PSE&G’s Five-Star Program, was $1,221,000, representing 8.6% of the project’s $14.2 million construction cost and 7.1% of its $17.1 million development cost.

The sustainable features were subsidized by $963,000 from the DCA pilot program and $258,000 from PSE&G’s Five-Star Program. Other public funding sources included $2.1 million from the Balanced Housing Program and $11.6 million in Low Income Housing Tax Credit equity.

West Side Village incorporated many sustainable features, among them: All ducts are located within conditioned spaces, and the techniques used to prevent air leakage included a compartmentalization strategy to vent each apartment individually, through sealing and taping of openings. The roof insulation on the factory building was urethane foam applied on the roof deck’s underside, combined with a sprayed application of cellulose to provide an effective thermal barrier and avoid venting the loft area. Materials at the job site were recycled. Ultra-high efficiency central water heating was employed. Energy Star lighting and appliances were installed. High-efficiency fiberglass windows were installed with solar heat-gain glass to reduce air-conditioning costs. Other sustainable features were blown cellulose insulation in both new construction and inside existing masonry walls, hardwood floors, and finishes that do not contain volatile organic compounds. Also, low-maintenance landscaping was used to eliminate the need for most watering. It was anticipated that West Side Village would use 45% less energy for heating, cooling, and water heating than a building that meets the standards of the 1993
Model Energy Code of the Council of American Building Officials (CABO). In April 2000, with the factory building more than two-thirds complete, DCA and RPM Development Company held a “construction open house” at the site, hosting 40 developers, consultants, lenders, and government officials. This open house supported the DCA’s mission to create a market transformation by demonstrating the innovative ventilation and insulation strategies as well as fiberglass windows, exterior treatments, and interior finishes [6].

5 Case study: Eastampton Town Center

Eastampton Town Center – a 100-unit townhouse development on a 25-acre site – was the only suburban project among the eight winning proposals. Developed by Pennrose Properties and completed in the fall of 2002, Eastampton Town Center also earned designation as one of the pilot program’s four “exemplary projects.” The project included 70 three-bedroom and 30 two-bedroom apartments, plus a centrally located community building with laundry facilities. All of the units were designated for low-income households (defined by HUD as having a gross income at or below 50% of the median). The total cost of sustainable items, including energy-efficient items to meet the requirements of PSE&G’s Five-Star Program, was $1,333,755, representing 12.5% of the project’s $10.6 million construction cost and 9.8% of its $13.5 million development cost. DCA’s pilot program subsidized $1,288,555 in sustainable features and PSE&G contributed $199,152 from its Five-Star Program. Other public funding sources included $2.5 million from the Balanced Housing Program and $7.8 million in Low Income Housing Tax Credit equity.

Eastampton Town Center incorporated many sustainable features. Solar water heating was used in the common laundry. Buildings were sited, and facades, windows, and overhangs were varied, to take advantage of solar orientation. Buildings were clustered with common spaces between them. Two-by-six stacked framing was employed. “Rain gardens” bordering the roads were created to absorb runoff. Low-maintenance landscaping was planted. Construction included advanced air-sealing techniques and cellulose wall and ceiling insulation; low-energy ventilation fan; and all Energy Star appliances. It was anticipated that Eastampton Town Center would use 35% less energy for heating, cooling, and water heating than a building that meets the standards of CABO’s 1993 Model Energy Code.

The pilot program was the catalyst for a dramatic change from the initial Eastampton application to the complex that was constructed three years later. The initial application presented a typical suburban, automobile-focused design, with broad loop roads, cul-de-sacs, widely separated linear townhouses, and an abundance of 90-degree on-street parking directly in front of the proposed housing units. The inherent focus was on the automobile in the everyday activities of the residents, with buildings situated mainly in response to the established roadway system. With the assistance of the pilot program team the developer redesigned the project as a traditional neighborhood that dramatically reduced the amount of pavement and reconfigured the buildings. The final project featured a compact road system, small buildings of four units each grouped in clusters and positioned to take
advantage of solar gain, a centrally located community building, sidewalks and trails to encourage walking, ball fields, and meadows.

Supporting DCA’s desire for market transformation, the developer reported its intention to employ many of the sustainable features in future projects, such as by using 2x6 stacked framing, varying window sizes based on solar orientation, installing solar water heating in the laundry, and using low-maintenance landscaping and rain gardens bordering roads [7].

6 Other projects

Springfield Village, a project developed by JP Affordable Housing, was the second project to receive funding from the pilot program and complete. After its first phase of construction (for-sale single-family homes) was completed and the homes occupied in May 2001, the PATH consultant Steven Winter Associates used software modeling to estimate the energy benefits of strategies employed on the project and calculated 32% savings in cooling costs. PSE&G then supplied fuel records covering the 2001 cooling season (June 12-September 10), which indicated cooling costs that were even lower than expected – approximately 47% below the software-modeled standard home.

Four other projects are in various stages of development, while one has dropped out of the pilot program [8].

7 Results

The pilot program demonstrated that with reasonable public subsidy, affordable housing units can be constructed that are energy-efficient, have excellent insulation and ventilation, and have durable interior and exterior finishes. Based on these promising results, DCA announced in 2001 that recipients of all future Balanced Housing funds would have to incorporate sustainable development strategies into their projects, achieving the Energy Star standard. DCA also created a Green Homes Office to promote the sustainable principles of the pilot and encourage replication of the program’s model projects.

In an April 2002 report, PATH declared, “Overall, the NJ Sustainable Affordable Pilot Program as a PATH Demonstration Project is considered a success, blending environmental concerns and energy efficiency with affordability. ... The program fulfills its promise by providing funding and technical resources for other builders to achieve similar levels of excellence.” EPA also endorsed the pilot program by selecting it for a Clean Air Excellence Award in 2000. And the New Jersey Housing and Mortgage Finance Agency began to award points for Energy Star compliance in the application process to its highly competitive Low Income Housing Tax Credit program, encouraging more affordable-housing developers to adopt sustainable strategies into their plans [9].

The most significant endorsement, however, came from K. Hovnanian Companies, the largest home builder in New Jersey. In December 2001, Hovnanian declared that its future homes would meet voluntary New Jersey Energy Star
standards, cutting natural gas and electricity use by at least one third. This was a strong indication that a market transformation was taking place in the housing industry [10].

* Jane M. Kenny served as Commissioner of the New Jersey Department of Community Affairs from 1996 to January 2002.

References


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