

## Vermont Housing & Conservation Board

### POLICY ON ENERGY EFFICIENCY AND WATER CONSERVATION IN MULTI-FAMILY RESIDENTIAL PROPERTIES

Adopted 3/15/12

#### **Background**

The Vermont Housing & Conservation Board's dual mission of affordable housing and conservation of land requires that the board address issues that adversely impact the environment and lead to climate change. The board's historic preservation mission's emphasis on the preservation of historic structures – and in particular preservation of historic buildings that serve as affordable housing - presents the challenge of making those buildings affordable and energy efficient. It is within that context that this policy has been developed.

The State of Vermont has adopted a Comprehensive Energy Plan that sets a goal of meeting 90% of the State's energy needs from renewable sources by 2050. If that goal is to be met the residential sector will need to play a significant role. Energy efficiency and conservation are the first priority of the plan.

Energy price fluctuations can dramatically alter the operating costs of affordable housing. A once financially stable development can find itself facing a serious operating deficit. Volatility in fossil fuel markets throughout the U.S. in 2008 contributed to significant distress in affordable housing portfolios across much of Vermont. In the portfolio of multi-family affordable housing developments funded by VHCB, average energy costs doubled within a three year period, yet the ability to raise rents to cover those costs is limited because of the very low incomes of many of the residents – approximately half have annual household income of less than \$15,000. Many multi-family rental properties that had been financially stable suddenly found themselves with operating deficits due solely to the dramatic increase in the price of oil.

One effective way to reduce the effects of energy market volatility is to improve the energy performance of affordable housing to the point where energy costs are minimized and therefore pose little or no threat to ongoing operations. Technologies and construction practices have evolved, with innovations in building and energy systems that now allow energy operating costs to be further reduced from even recent standard practice. Since 2008, affordable housing developers throughout Vermont, often with funding from VHCB and/or the Vt. Fuel Efficiency Partnership, have addressed the most pressing energy efficiency needs in the most energy inefficient buildings in their portfolio and have frequently added solar thermal domestic hot water or other renewal energy systems to the building. Two foundational reports, *A Roadmap to Energy Affordability (Roadmap)* and *Mechanical System Optimization Guide* provide a strong technical foundation to continue this work and increase the level of energy efficiency in new developments as well as in portfolio properties undergoing rehabilitation.

#### **Goals and Specifications**

This revised and updated policy on energy efficiency and water conservation is designed to build on the foundation laid by the Roadmap and the Mechanical System Optimization Guide and the goals and priorities set forth in the State's Energy Plan. Working with its partners in both the funding and

development community, VHCB's goal has been to develop a balanced approach with regard to cost, cost effectiveness, energy savings, operational and maintenance issues, and historic preservation.

## I. General Goals

Multi-family housing developments receiving funding from VHCB should:

- A. Achieve a level of energy and water efficiency that will result in maximum long-term operational affordability. This should be done by undertaking deep enough energy efficiency measures so that the cost of heat, hot water, and electricity become a small enough portion of the operating budget that overall housing affordability can be maintained over time as the price of fuel and electric power increase.
- B. Select designs and systems with consideration of:
  - 1. Both immediate and future cost effectiveness
  - 2. Operational affordability over time
  - 3. Durability
  - 4. Flexibility
  - 5. Operational and maintenance cost
  - 6. Impact on the environment including greenhouse gas emissions
  - 7. Utilization of renewable resources
  - 8. Minimizing potential negative impacts on historic buildings
  - 9. Ventilation and indoor air quality
- C. Plan and implement mechanisms to encourage energy and water conservation practices by residents and owners.
- D. Keep records of energy consumption by fuel type and on an individual building basis and on a residential unit basis where metering permits.
- E. Periodically re-evaluate the energy and water systems of each building for cost-effective improvements and technological advances
- F. Train maintenance staff to maintain energy efficient mechanical systems

## II. Specific Energy Efficiency Goals & Specifications

- A. Specifications for construction or rehabilitation shall include the energy and water use aspects of the work and shall specifically address: building envelope, heating, ventilating, and air conditioning systems, domestic hot water system, lighting system, appliances, water saving devices, and renewable energy systems if applicable.
- B. Specifications should take into account the necessity to preserve important features of historic buildings.
- C. Grantees may be required to employ an energy professional in the development of specifications and to supervise the energy related portion of the construction work.

All multifamily new construction and rehabilitation in Vermont is subject to the requirements of the Vermont Residential Building Energy Standards (RBES 2011) and in a few cases, its commercial equivalent, (CBES). The specific requirements of VHCB's standards by building component are contained in the VHCB & VHFA Multifamily Energy Design Standards

spreadsheet, one of four documents incorporated as part of this policy. These four documents are:

- 1) [2012 VHCB & VHFA Multifamily Energy Design Standards](#)  
(Links to Efficiency Vermont website docs):
- 2) [Efficiency Vermont Multifamily Program Requirements](#)
- 3) [Multifamily Mechanical Design Protocol](#)
- 4) [Multifamily Air Sealing Protocol](#)

The Multi-Family Energy Design Standards outline a required baseline standard along with Tier II optional deeper energy standards that developers are encouraged to meet. In a few instances, (regarding ceiling & wall insulation, window R level for smaller buildings, air sealing and on-site solar hot water generation), the Multi-Family Energy Design Standards are more rigorous than the RBES. The mechanical system design and air sealing protocols address process related concerns during design and construction. All projects are also expected to follow those standards incorporated in Efficiency Vermont's Multifamily Checklist that are not superseded by VHCB's Energy Design Standards in 1) above.

### III. Specific Water Savings Goals & Specifications

Projects should seek to include cost effective water saving measures. At a minimum, shower heads and aerators should be consistent with Efficiency Vermont's Multifamily Checklist; 1.5 GPM showerheads, 1.5 GMP kitchen faucets and 1.0 GMP bathroom faucets. In addition, toilets should be rated at less than or equal to 1.6 gallons per flush.

### IV. Indoor Air Quality Goals

Developers should strive to achieve the highest indoor air quality in both new and rehabilitation projects. Controlling moisture infiltration and air leakage is essential. By adding effective ventilation, units should be designed to reduce moisture resulting in fewer mold and mildew problems. Efficient heating systems should force exhaust outside and in turn keep indoor air clean.

### V. Policy Implementation

VHCB staff will review project drawings, specifications and bid documents including alternates and deducts for compliance with the standards outlined in this policy. Developers and their contractors are expected to follow the standards and protocols as outlined herein with an emphasis on designing projects to meet these standards. It is expected that actual achieved energy performance will vary from project to project as result of various factors related to building design type and issues related to building rehabilitation. As such, these standards are not to be interpreted as performance standards but may be modified in subsequent revisions to reflect data on achieved energy performance post construction.

### VI. Education

Grantees are encouraged to employ techniques to make residents aware of energy and water consumption, to educate them about ways to reduce consumption, and, if feasible, provide incentives to do so.