

## MVC POLICY FOR DRI REVIEW

# 4. Energy and Environmental Building



This policy gives guidance to applicants seeking approval of Developments of Regional Impact (DRIs) by the Martha's Vineyard Commission regarding energy use and green-building. The aim is to ensure that projects are designed to minimize fossil fuel use, by employing energy efficiency techniques and renewable energy sources. It also seeks to encourage the use of environmentally sound "green-building" design techniques. This document describes the procedure for evaluating projects from this point of view.

***This policy is one of a series prepared to help Applicants and members of the public understand how the Martha's Vineyard Commission evaluates proposed Developments of Regional Impact (DRI), as mandated by its enabling legislation, Chapter 831 of the Acts of 1977 as amended.***

***The Commission is mandated to weigh the benefits and detriments of certain proposals to determine whether they should be approved, approved with conditions, or denied. Consult the Commission's website***

***(www.mvcommission.org/DRI) or office (508-693-3453) to obtain the other documents. This policy reflects MVC practices in reviewing subdivisions and development over the past generation. It is set forth in order to assist Applicants in preparing proposals that address the Commission's concerns.***

***The Commission will use this policy during review of the benefits and detriments of a DRI and to formulate conditions attached to the DRI if it is approved. It should therefore be used by the Applicant to help design projects and could serve as the basis of proposals, or "offers", to offset anticipated detriments. Applicants are invited to consult the MVC's DRI Coordinator and Commission staff for help in identifying which policies apply to their project.***

***This policy is generally a good indication of the Commission's concerns and can help the Commission evaluate the merits of a proposal. However, the Commission weighs the overall benefits and detriments of all aspects of a project, and evaluates each proposal on its own merits. Based on the particular circumstances of each proposal, the Commission could deny a project that respects some or even all of the policy or might approve one that does not meet all parts of the policy. The Commission recognizes that there might be special circumstances whereby deviations from the policy are appropriate.***

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Adopted by the Martha's Vineyard Commission on December 4, 2008.

Cover: Vineyard Energy Project's installation of solar panels at the Vineyard Haven Ferry Terminal.

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# 1 BACKGROUND

**Energy Use on Martha's Vineyard:** The dependability of energy supplies has long been a particularly important matter to our island community and the environmental impacts of using fossil fuels has emerged as a near universal across the world. Energy is one of the Vineyard's main imports, with about 65% of the energy used in heating and cooling, lighting, and other electricity-dependant functions, and the remaining third used in transportation. Our present sources of energy are oil, propane, gasoline, and electricity, the latter of which is produced primarily from natural gas, nuclear, coal and oil (in that order).

**Why Reducing the Use of Non-Renewable Energy is Important:** Having an affordable, environmentally sound, reliable, and safe supply of energy is essential to the general welfare of Martha's Vineyard.

- **Reliability of Supply:** Because we depend almost entirely on imported energy, we face increased risks, higher costs and concerns about interruption of supply. Fuel shipped by ferry or barge exposes the island to hazards and accidents. The depletion of fossil fuel sources worldwide increase the potential of supply shortages and price fluctuations beyond our control. Transmitting electricity by underwater cables and overhead wires exposes us to periodic interruptions.
- **Economic Impacts:** Energy costs on the Vineyard are very high and contribute substantially to our higher cost of living. Island gasoline prices are among the highest in the nation. Both the Vineyard's year-round community and visitor-based economy are particularly sensitive to high energy costs. Most of the energy dollars spent on-island do not benefit our local economy: they do not get spent on local goods nor expand business opportunities.
- **Environmental Consequences:** Burning fossil fuels results in air and water pollution that is changing the natural environment and endangering public health. The Cape and Islands already experience among the poorest summer air quality in Massachusetts. The Vineyard is especially vulnerable to the predicted Climate Change impacts of rising sea levels, more severe weather, and increased health risks from insect-borne diseases. The environmental effect of using fossil fuels has emerged as a nearly universal concern. NASA climatologist James Hansen has stated that a 2°F rise in temperature is the limit "to avoid our living on a different planet." At the present rate of rise – *much* faster than scientists had been predicting – he predicts that we have 10 years in which to make significant changes

**Energy Targets:** In setting this policy, the Commission seeks to establish a clear energy-efficiency target for projects reviewed as DRI's by the MVC. The Commission seeks a target commensurate with the challenge we are facing. It also seeks a methodology that is as standardized and widely used as possible, and that places the least administrative burden on applicants. However, it appears that many different entities use different standards and techniques for similar objectives. Therefore, this policy employs several existing techniques, depending on the scale of the project.

To begin to encourage greater energy awareness and improved energy practices, this Policy:

- Employs a target related to the Mass Energy Code for all proposals;
- Requires Energy Star certification for most projects, as is being used with increased frequency throughout the United States;
- Requires conformity to LEED certification criteria for large projects, also being required in many municipalities for larger building projects.

Relation to Mass Energy Code: This provides the minimal energy efficiency target, requiring a percentage by which a project must surpass the Code. It involves providing the energy calculations that all builders are required to do to obtain a building permit.

Energy Star Certification: This provides a more comprehensive set of energy objectives, and requires project certification by a third party. Energy Star includes energy-saving features such as increased insulation, high performance windows, tight construction and ducts, and efficient heating and cooling that typically make certified buildings 20–30% more efficient than standard buildings.

LEED: The Leadership in Energy and Environmental Design Green Building Rating System™, administered by the non-profit U.S. Green Building Council, outlines sustainable green building and development practices. Its performance criteria cover five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality. It requires certification after project completion. LEED offers four levels of certification: basic, silver, gold, and platinum. Since it is possible to get LEED certification without meeting very high energy standards, this policy's use of LEED is in addition to meeting energy standards. (Note that while LEED criteria include water resources, they are not addressed here because they are dealt with in the MVC's Water Resources DRI Policy.)

**Environmental Design:** In addition to concerns about energy, there is broad concern about the environmental impact of building construction techniques and materials on resource consumption: the latter being especially relevant, given the Island's constraints on transportation of new and used materials, constraints on disposition of waste, and other limits.

*Note: In the future, the MVC might move to higher targets. The 2030 Challenge, proposed by architect Ed Mazria in response to Hansen and other scientific data, recommends that all new buildings, developments and major renovations be designed to meet a fossil fuel energy consumption performance standard of 50% of the regional average for that building type. It further suggests that the fossil fuel reduction standard for all new buildings be increased 10% every 5 years so that by 2030, communities are achieving a standard of carbon-neutrality (using no fossil-fuel greenhouse gas emitting energy to operate). The 2030 Challenge also suggests that, at a minimum, as existing buildings are renovated, they meet a fossil-fuel, energy-consumption performance standard of 50% of the regional average for that building type through innovative design strategies, the application of renewable technologies and/or the purchase of renewable energy – the latter of which should not be credited for more than 20% of the reduced fossil-fuel consumption. The MVC will periodically monitor the availability of locally-based benchmark data and the experience of other communities in pursuing this more aggressive standard.*

## 2 GOALS AND OBJECTIVES

**Goal:** The goal of this policy is to reduce the consumption of fossil fuels, to promote the use of renewable sources of energy, and to encourage use of environmentally sound building techniques on Martha's Vineyard.

**Objectives:** The Energy and Environmental Design Policy seeks to promote the responsible use of limited energy resources through the following objectives.

- Encourage energy conservation.
- Improve energy efficiency.
- Stimulate investment in renewable energy resources.
- Manage land use to maximize energy efficiency.
- Minimize wasteful consumption of resources.

It seeks to promote environmental building techniques, particularly through the following objectives.

- Minimize demolition of existing buildings or scrapping of building materials
- Use environmentally sound building practices.
- Minimize the generation of construction waste and dispose of it in the best possible way.
- Ensure healthy indoor air quality
- Reduce light pollution.



*Photo: Vineyard Energy Project*

## 3 POLICY

**In order to determine the benefits and detriments of a DRI application with regards to energy and environmental design, Commissioners will evaluate the extent to which applications incorporate the following criteria.**

- All proposals should address this policy’s qualitative criteria for energy conservation described in sections 3.1 and 3.2, should meet the quantitative standard for energy efficiency described in section 3.3, and should address the environmental building criteria described in section 3.4.
- In addition, all non-residential projects with a new floor area greater than 3000 square feet and residential projects of four to nineteen units should be certified by Energy Star.
- Projects with a new floor area greater than 6,000 square feet and residential projects of twenty or more units should meet the standards for LEED certification, at least at the certified level and at higher levels if possible.

### Summary of Policy Requirements

Category of Project		Criteria	
Residential Development	Non-Residential Development	Quantitative Energy Efficiency Standard (Section 3.3)	Qualitative Energy and Green Building Standards (Sections 3.1, 3.2 and 3.4)
All	All	20% better than Building Code	Narrative
4 to 19 units	3,000 to 6,000 sq.ft.	Energy Star Certified	Narrative
20 or more units	6,000 or more sq.ft.	LEED Certifiable	LEED Certifiable

### 3.1 Energy – Minimize Energy Consumption through Planning and Design

#### 3.1.1. **Location:** Locate development to minimize auto use and encourage walking.

- In or within walking distance of town centers and/or stores
- Within walking distance of public transit
- Within walking distance of a school
- Close to bicycle paths.

#### 3.1.2. **Land Uses:** Incorporate mixed land uses to minimize auto use and encourage walking.

- Projects that combine housing with commercial activities
- Home work spaces in residential developments
- Daycare in or near projects with a concentration of employees

#### 3.1.3. **Transportation:** Encourage use of public transit, bicycles, and walking as well as fuel-efficient vehicles.

- For commercial, office, and institutional projects, provide automobile parking outside the town center and provide employee transportation.
- Plan for pedestrian circulation within the project.
- Integrate with or add to existing/planned area pedestrian trails and multi-use paths, where appropriate.
- Consider bike lanes to promote the use of bicycles for transportation.
- Incorporate pedestrian and bicycle amenities such as rest areas, bike parking, and signage.
- Provide pedestrian access to transit, and bus lay-bys and/or bus shelters where appropriate.
- Provide employees incentives to use public transit (e.g. free bus passes).
- Design the site or adopt programs that promote the use of fuel-efficient vehicles and carpooling. These might include a purchase/rental program of fuel-efficient vehicles for building occupants, a carpooling program, and the provision of preferred parking spaces for fuel-efficient and carpool vehicles.
- Do not provide more parking than is required by code.

## **3.2 Energy – Consider Energy in Site Layout and Landscaping**

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### **3.2.1. Site Design: Incorporate or Provide for Renewable Energy Generation.**

- Designate an area for the incorporation, either now or in the future, of renewable energy generation – such as an array of solar panels, a wind turbine, or geo-thermal – which allow for greater energy self-sufficiency.
- Consider energy generation shared among several properties.
- Cluster buildings to facilitate use of renewable energy sources – both on individual properties and shared facilities.

### **3.2.2 Building Location and Orientation: Locate and orient buildings to maximize solar gain for heating, daylighting, and generating electricity.**

- Locate buildings on parts of the site with fewer trees to the south, to allow maximum winter heat gain.
- Orient the building to maximize south-facing windows, south-facing roofs and southern exposure to the extent that site or historic considerations allow.

### **3.2.3. Landscaping: Make landscaping choices with energy concerns in mind.**

- Keep or plant deciduous trees to provide shade and natural cooling in the summer and maximum sun penetration in the winter.
- Keep or plant evergreen trees to serve as wind breaks against winter winds and thereby reduce heating loads.
- Minimize watering, operation of pumps, and mowing by limiting managed turf areas; by using native, native-adapted, or other low-maintenance species; by using root-zone and drip irrigation; and by using rainwater and graywater collection for irrigation.

### **3.3 Energy - Design Buildings to Reduce the Use of Fossil-Fuel-Based Energy**

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#### **3.3.1 Building Efficiency: Buildings shall be designed and constructed to exceed the Massachusetts Building Code by at least 20% and, if so determined by the Commission, to also meet federal Energy Star standards. The Commission may require reductions of more than 20% for uses for which very high energy consumption is anticipated.**

Note that if it is not possible to meet this standard, the excess may be offset by incorporating renewable energy generation into the project, and/or by providing off-site mitigation, as described in sections 3.3.2, 3.3.3, and section 4. The objective is to reduce the net fossil-fuel energy use, equal to the total energy use minus the energy generated from renewable sources or by off-site mitigation.

*Note: The following are some techniques that can improve a building's energy performance:*

- *Non-mechanical building design features such as:*
  - *Concentrating windows on the south façade;*
  - *Additional summer shading for east and west facing facades;*
  - *Large roof overhangs on south-facing walls to minimize summer solar gain while allowing winter solar gain;*
  - *Light-colored roofs;*
  - *Natural cooling measures such as cross-ventilation;*
  - *Measures utilizing natural lighting (daylighting).*
- *Air-tight building techniques and increased levels of insulation, combined with heat recovery mechanical ventilation.*
- *High R-value windows and doors (South-facing windows should be uncoated, and have a solar heat gain coefficient of .5 or higher).*
- *Components that allow effective zoning of heating and cooling.*
- *High-efficiency heating, air conditioning and water heating.*
- *High-efficiency lighting indoors and out. Timers and motion detectors*
- *Water efficient equipment.*
- *Energy Star rated appliances or better.*

#### **3.3.2. Renewable Energy: Design and construct all buildings to provide for the incorporation - now or in the future - of renewable energy.**

- Design all buildings to allow for installation of solar-hot-water and/or solar-electric panels on the roof, unless this is not possible or appropriate because of site conditions or historic context.
  - Provide a large, unshaded, uninterrupted expanse of south-facing roof (within 30 degrees of true south). Provide insulated copper piping from the roof to the basement for solar hot water and conduit for solar electric conductors, in accordance with the National Electric Code requirements.
  - Alternatively, provide a south-facing, unshaded ground area able to receive a solar array.
- For heated swimming pools:
  - Provide solar pool heating for swimming pools adequate to meet their heating demand; or



- Provide solar hot water collectors to provide heat for the house in the winter and heat for the pool in the summer with the assistance of a heat exchanger; or
- Provide sufficient on-site renewable energy to offset, at a minimum, the electrical use of heating pool water with electric water heaters or ground source heat pumps.

*Note: Sites employing solar pool heating technologies should have reasonably unobstructed solar access from the south from 9 a.m. to 3 p.m. and be close to the pool equipment area.*

- Consider the use of renewable energy sources – solar hot water, solar electric, wind turbines and geo-thermal.
- For space heating, consider the use of clean and efficient solid fuels (e.g. wood and pellet burning stoves) that meet safety and EPA emission standards.



### **3.3.3. Off-Site Mitigation: Under certain circumstances, up to 20% of a project's energy use may be offset with off-site mitigation.**

If attempts by the applicant fail to meet the energy efficiency limit (section 3.3.1) even after subtracting the portion of energy generated on-site from renewable sources (section 3.3.2), the Commission may consider measures by the applicant to offset the excess energy demand – up to 20% of the total energy use – in one of three ways:

- Installation at the Applicant's expense of equivalent energy efficiency measures or renewable energy generation in another Island location, particularly for a public building or affordable housing project,
- A financial contribution of an equivalent value to a Vineyard public entity or not-for-profit organization for use for installation of energy efficiency or renewable energy, or
- A contract to purchase an equivalent value of Green Power Credits on Martha's Vineyard or, if not available, as close to the Vineyard as possible.

## **3.4 Environmental Building – Use Environmentally Sound Building Practices**

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**All projects that are not required to be LEED Certifiable (new floor area less than 6,000 square feet and residential projects of fewer than twenty units) shall address the following environmental building criteria to the greatest extent possible, and shall provide a narrative explaining how.**

*Note: This section is based on those sections of the LEED program not covered by other parts of this policy, or other DRI Policies such as Water Quality and Open Space.*

### **3.4.1 Sustainable Sites: Projects should, where possible, be located on sustainable sites and be laid out in a sustainable way.**

Sustainable site selection and development criteria include the following.

- Avoid development of inappropriate sites or parts of sites such as prime farmland, habitat for rare or endangered species, located within 100 feet of wetlands, or is a non-water-related use within 50' of a water body. (See also DRI Policy on Open Space.)
- Favor sites that were previously developed.
- Favor sites in town or village areas, within a half mile of basic services (including a grocery store, a general store, a pharmacy, a school, a restaurant, and a post office) or within a half mile of higher density residential areas.
- Provide shading for a considerable proportion of parking lots and other hard surface areas.
- Minimize exterior lighting from the building and site to areas and times needed for safety, and ensure that there is no up-lighting, glare, or direct lighting beyond the property line.

### **3.4.2 Materials and Resources: Reduce the waste of materials and use environmentally sound materials, both in project construction and ongoing use.**

Appropriate practices include the following.

- Maximize reuse of existing buildings. If an existing building cannot be preserved, it should preferably be moved and reused in another location. Failing that, as many the building elements and materials should be preserved and reused, either on site or in another project.
- Use environmentally sound construction materials such as salvaged, refurbished, or reused materials, materials incorporating recycled content, regional materials, rapidly renewable materials, and certified wood. Incorporate materials that are durable, non-toxic and require no finishes.
- Develop and implement a construction waste management plan to divert construction, demolition, and land-clearing debris from disposal in landfills.
- Provide an easily accessible area dedicated to the collection and storage of materials for recycling.

### **3.4.3 Indoor Environmental Quality: Enhance indoor air quality in buildings, thus contributing to the comfort and well being of occupants.**

Appropriate practices include the following.

- Ensure that interior spaces, both during construction and after occupancy, are well ventilated favoring use of naturally ventilated spaces. Design and construct for moisture, mold, and mildew prevention (utilizing air barriers, drainage, sealed basements/ crawl spaces). Design and construct for future radon mitigation if it becomes necessary;
- Reduce the quantity of indoor air contaminants from adhesives, sealants, paints, coatings, carpeting, composite wood and agrifiber products and from hazardous gases or chemicals.
- Provide a high level of lighting system control and of thermal comfort system control by individual occupants or groups.
- Maximize building occupants' view of the outdoors and daylight.

## 4 APPLICATION OF THE POLICY AND SUBMITTAL REQUIREMENTS

This section describes the key steps for designing a project in accordance with the Energy Policy. Applicants are encouraged to consult the staff of the Martha's Vineyard Commission for assistance in application of the policy to their projects.

### **Step 1: Determine the Standards to Apply**

The applicant should submit a description of the scope of the project to the Commission in order to allow determination of which standard will apply. The Land Use Planning Committee will determine the scope at a Pre-Application Meeting.

### **Step 2: Address the Qualitative Sections of the Policy**

Prepare a brief narrative that outlines how the proposal addresses the qualitative sections of this policy.

### **Step 3: Calculate the Energy Efficiency and Offsets**

Calculate the energy efficiency of the proposal using RES-Check or COM-Check. If the energy efficiency does not meet the target, increase the energy-efficiency measures to improve compliance. If it is still impossible to meet the target, outline on-site renewable generation or offset mitigation measures as described in the policy. The Applicant should consider offering, or the Commission may stipulate in its conditions of approval, the use of a blower-door test of completed structures or some other method to demonstrate proper installation of energy-efficiency measures.

### **Step 4: Provide application information for Energy Star or LEED**

If the project is required to get Energy Star Certification, or be LEED Certifiable, submit the respective completed application form as part of the DRI application.

Clarify whether the proposal exceeds this minimum standard, either through efficiency measures or through use of renewable energy, so that the Commission may consider this in weighing the benefits and detriments of a proposal.

In the case of a Development of Regional Impact where the Commission will not be reviewing building plans (e.g. a residential subdivision), this policy shall nevertheless apply to all future buildings. In such cases, the applicant should outline a procedure, or the Commission may stipulate in its conditions of approval, that the builders of such subsequent buildings demonstrate to the Commission that they are adhering to this policy.

### **Submittal Requirements**

The following materials should be submitted as part of the DRI application:

- Narrative outline of how all the elements of this policy are addressed.
- Calculation of energy efficiency using COM-Check or RES-Check.
- Application for Energy Star or LEED, if required.

The final Energy Star certification, if required, should be submitted to the Commission according to the conditions of the Commission approval. The Commission may make issuance of the Certificate of Occupancy subject to the receipt of certification.



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