Energy

This guidance is intended to clarify how the Energy Goal and Objectives of the Regional Policy Plan (RPP) are to be applied and interpreted in Cape Cod Commission Development of Regional Impact (DRI) project review. This technical bulletin presents specific methods by which a project can meet the goal and objectives.

Energy Goal: To provide an adequate, reliable, and diverse supply of energy to serve the communities and economies of Cape Cod.

- ***Objective EN1*** *– Support renewable energy development that is context-sensitive*
- ***Objective EN2*** *– Increase resiliency of energy generation and delivery*
- ***Objective EN3*** *– Promote energy efficiency and conservation measures by minimizing energy consumption through planning and design*

The applicability and materiality of these goals and objectives to a project will be determined on a case-by-case basis considering a number of factors including the location, context (as defined by the Placetype of the project's location), scale, use, and other characteristics of a project.

THE ROLE OF CAPE COD PLACETYPES

The RPP incorporates a framework for regional land use policies and regulations based on local form and context as identified through categories of Placetypes found and desired on Cape Cod.

The Placetypes are determined in two ways: some are depicted on a map contained within the RPP Data Viewer located at www.capecodcommission.org/RPPDataViewer adopted by the Commission as part of the Technical Guidance for review of DRIs, which may be amended from time to time as land use patterns and regional land use priorities change, and the remainder are determined using the character descriptions set forth in Section 8 of the RPP.

The project context, as defined by the Placetype of the project's location, provides the lens through which the Commission will review the project under the RPP.

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INTRODUCTION

Energy policy and regulation in Massachusetts originates and is largely administered and implemented at the state level. Closely aligned with its general energy policy and regulation, Massachusetts has adopted climate change policy, which promotes renewable energy sources, storage and greenhouse gas emissions reduction. State law also sets an energy storage target for electric distribution companies and the delivery of clean energy during seasonal peak hours. Massachusetts' Global Warming Solutions Act (St. 2008, c. 298) sets targets on greenhouse gas emissions reduction and contains directives to certain state agencies regarding renewable energy development and greenhouse gas emissions reduction. The Massachusetts Green Communities Act (St. 2008, c. 169) is companion legislation directed to municipalities in Massachusetts, which supports the state's overall climate change and clean energy approach. This legislation creates incentives for municipalities to adopt energy efficiency and conservation measures, promote renewable energy development and pursue greenhouse gas emissions reduction strategies. In November 2024, Massachusetts adopted an Act Promoting a Clean Energy Grid, Advancing Equity and Protecting Ratepayers ("2024 Climate Act", St. 2024, c. 239). The 2024 Climate Act supports development of renewable energy generation and storage facilities, and directs state agencies to promulgate new regulations for siting and permitting such facilities.

The Commission plays a distinct role in a complex network of energy policy and regulation. Regional energy policy under the RPP is intended to support and fit within the Commonwealth's established policy and regulatory framework; it is not intended to be independent of the Commonwealth's approach, and the Commission cannot and does not implement state energy policy and regulation directly.

Building energy codes and technologies have made the prospect of "Net Zero" building increasingly attainable. Zero energy certifications have been developed by organizations such as the US Green Building Council (USGBC), Passive House Institute US (PHIUS), US Department of Energy (DOE), and Residential Energy Services Network (RESNET). Many definitions of net zero buildings have been developed, but all incorporate the basic concept that a building maximizes energy efficiency to reduce energy demand and consumption, promote building systems electrification, and generates as much energy as it uses.

The primary purpose of the Energy Goal and Objectives in the RPP is to ensure an adequate, reliable, and diverse supply of energy to serve the communities and economies of Cape Cod. Energy efficient design, conservation measures, and diverse energy sources, including renewable and alternative energies, support the availability and adequacy of supply.

This Technical Guidance provides examples of various methods and strategies that DRI projects may use to satisfy the RPP's Energy Goal and Objectives. These methods and strategies deal generally with building and operational energy efficiency and conservation, renewable energy and energy storage, and the general provision of adequate and reliable energy infrastructure. The Energy Goal, Objectives, and methods apply over a wide array of development, according to the type of development or use proposed: from utility-scale energy infrastructure as a principal use, to building and other development projects where energy use is an ancillary design and operational consideration.

SUMMARY OF METHODS

GOAL | ENERGY

To provide an adequate, reliable, and diverse supply of energy to serve the communities and economies of Cape Cod.

Objective EN1 – Support renewable energy development that is context-sensitive

METHODS

All DRIs must:

- Enter into a "Green" power purchase agreement; and/or,
- Incorporate on-site renewable energy generation or alternative energy use, including but not limited to: solar photovoltaic (PV), wind, solar thermal, geothermal, solar carport, fuel cells, the use of biofuels

For projects with energy generation, distribution or storage as a primary purpose, transmission infrastructure should utilize existing rights-of-way and new systems should connect to existing substations when feasible. New substations to support these systems should be sited in areas of compatible development and be sized to accommodate future connections.

For guidance on appropriate design and protocols related to proposed Wind Energy Conversion Facility projects, see Appendix "A."

Objective EN2 – Increase resiliency of energy generation and delivery

METHODS

- Protect infrastructure by locating utilities underground
- Manage for peak demand and power outages by:
    - Incorporating energy storage technology, including but not limited to storage batteries or technology, and/or emergency backup generators;
    - Enrolling in the ConnectedSolutions, or similar program; or
    - Installing 'smart meter' technology to monitor building energy use

Objective EN3 – Promote energy efficiency and conservation measures by minimizing energy consumption through planning and design

METHODS

- Design buildings to be LEED certifiable
- Design buildings to be Energy Star certifiable
- Design buildings to be Passive House certifiable
- Design buildings in compliance with the Municipal Opt-in Specialized energy code (Specialized Code)
- Perform a pre-development or redevelopment energy audit, incorporate recommendations to the maximum extent practicable
- Incorporate building design elements, including but not limited to:
    - Combined Heating and Power (CHP) system
    - Energy efficient lighting and appliances
    - Water efficient appliances
    - Building envelope conservation measures
    - Incorporate green or cool roof
    - Sub-metering per building unit
    - Incorporate site design elements such as passive heating/cooling/lighting, including building orientation/solar exposure
- Incorporate operational elements, including but not limited to:
    - 'Smart thermostats' for heating and cooling
    - Smart automation technology for building system management, such as lighting and/or water use based on occupancy and/or time of day

DETAILED DISCUSSION OF METHODS FOR MEETING OBJECTIVE EN1

Objective EN1 *– Support renewable energy development that is context-sensitive*

The intent of Objective EN1 is to support an adequate and diverse supply of energy for and to Cape Cod. Local energy generation can increase energy independence and support existing development. DRI applicants must purchase renewable or alternative ("Green") power from energy suppliers, generate their own renewable power or incorporate alternative energy use, or implement a combination of these methods to demonstrate consistency with Objective EN1. However, for discrete building projects where EN1 is found applicable and material, the Commission has a preference for incorporating on-site renewable energy generation.

Green power purchase

Under the Massachusetts Renewable Energy Portfolio Standard (RPS), for every megawatt hour (MWh) of electricity added to the New England electric grid from a renewable energy generator, a Renewable Energy Certificate (REC) is generated. These RECs are available for purchase, supporting the Commonwealth's goal to increase renewable energy generation. The Alternative Energy Portfolio Standard (APS) is a similar approach that focuses on the sale and purchase of renewable energy generated from alternative methods, such as biofuels, geothermal technology, or food waste, as examples. The sales and purchase of RECs claim a portion of the renewable energy generated regionally and added to the regional electric grid for use. Options for the purchase of renewable energy power may include a Power Purchase Agreement (PPA) or Net Metering Credit Purchase Agreement (NMA) with an electric utility provider or a third-party energy provider.

Applicants contracting with a renewable energy generator should provide documentation that the generator has the energy capacity to provide for such purchase.

Applicants choosing green power purchase in place of providing on-site renewable energy generation should include in their application materials a narrative explaining why on-site energy generation is not feasible.

More information about purchasing Green power can be found through the Cape Light Compact, Green Energy Consumers Alliance, or by contacting your utility provider. Projects proposing to meet Objective EN1 by purchasing Green power should provide documentation of the commitment and identify the renewable energy generator, utility, or other entity that is a party to the agreement.

On-site renewable energy generation

On-site renewable energy generation can promote a diverse supply of energy to serve an individual development or the community more broadly. Renewable energy generation facilities should be located on sites with existing disturbance and avoid new greenfield development to the extent practicable.

For solar renewable energy generation, the Commission encourages on-site generation to support discrete building development, and utility scale generation that is sensitive to the Cape Cod regional context while supporting Massachusetts' goals for renewable energy generation. Applicants proposing utility scale solar energy generation facilities should consult the Commission's solar screening tool and companion document "Siting Large-Scale Solar Photovoltaic Projects on Cape Cod" (see References and Resources) when locating their project and should plan for safety and decommissioning.

Where feasible, battery storage facilities should be co-located with renewable energy generation systems or where electricity consumption is high and reliability is essential (e.g., emergency shelters, hospitals, long-term care facilities, schools, large businesses). Battery storage facilities should be contained within a structure with the following features: a temperature and humidity-maintained environment; an impervious floor with a containment system for potential leaks of hazardous substances; a smoke/fire detection, fire alarm, and fire suppression system; a thermal runaway system; and a local disconnect point or emergency shutdown feature. The structure and systems must be designed and installed in accordance with all applicable State codes and safety requirements as well as safety measures recommended by the National Fire Protection Association's Standard for the Installation of Stationary Energy Storage Systems. See the Water Resources Technical Bulletin for guidance on secondary containment systems and Hazardous Substances.

DETAILED DISCUSSION OF METHODS FOR MEETING OBJECTIVE EN2

Objective EN2 *– Increase resiliency of energy generation and delivery*

The purpose of Objective EN2 is to support the reliability of the energy supply for and to Cape Cod. By increasing the energy resiliency of development, long-term energy savings, reduced impact on the environment, and less strain on the energy grid may be realized. Applicants are encouraged to propose alternate methods not listed below based on best practices for the type of project proposed, or as new technologies are developed and available.

The following are methods that may be implemented to meet Objective EN2:

Underground utilities

Locating utilities underground can reduce the risk of damage from storms and other events that overhead power wires and electric lines may face. DRI projects may locate on-site utilities for development underground, except where the presence of natural features such as wetlands or archaeological resources prevent such placement.

Manage for peak demand and power outages

Managing energy use for "peak demand" (times during the day when overall energy use is the highest), known as demand response, can reduce strain on energy generators which can cause power outages and decrease end user costs by reducing energy use when demand is highest, and often most costly. For energy consumers, this is known as Demand-side Management (DSM), where managing energy use for peak demand may not decrease total energy consumption but may reduce the need for energy infrastructure needed to meet the highest periods of energy use. For energy generators, Supply-side Management (SSM) focuses on providing customers with an adequate supply of energy during peak demand by incorporating energy infrastructure to support generation, distribution, and transmission.

INCORPORATE ENERGY STORAGE TECHNOLOGY

One example of managing energy use for peak demand is through energy storage technology that can store energy off peak hours for use during peak hours, including but not limited to storage batteries, fuel cells, or emergency backup generators.

ENROLL IN THE CONNECTEDSOLUTIONS PROGRAM (OR SIMILAR)

Enrolling in programs such as the ConnectedSolutions program allows a utility provider to manage project energy use during times of high demand. These programs often provide financial incentives to enrollees.

INSTALL 'SMART METER' TECHNOLOGY

Managing for peak demand can also include the installation of 'smart meter' technology to monitor building energy use during high demand times. Such technology can provide information on building systems energy use and allow energy managers to identify times of high energy use, where energy consumption levels can then be managed through energy efficiency or reduction measures.

DETAILED DISCUSSION OF METHODS FOR MEETING OBJECTIVE EN3

Objective EN3 *– Promote energy efficiency and conservation measures by minimizing energy consumption through planning and design*

The purpose of Objective EN3 is to promote energy use reduction and conservation. By increasing the energy efficiency of development, long-term energy savings, reduced impact on the environment, and less strain on the energy grid may be realized.

The following methods may be implemented to meet Objective EN3:

Design buildings to be LEED certifiable

Leadership in Energy and Environmental Design (LEED) is a green certification program of the US Green Building Council (USGBC) for building design, construction, operations, and maintenance. Green Business Certification Inc. (GBCI) administers LEED certification.

The LEED program uses a rating system of methods incorporated into a project to achieve credits towards a certification level: Certified (40-49 points), Silver (50-59 points), Gold (60-79 points), Platinum (80+ points). Methods to achieve LEED credits vary by the project type.

The categories of LEED rating systems are:

- Building Design and Construction (BD+C)
- Interior Design and Construction (ID+C)
- Building Operations and Maintenance (O+M)
- Neighborhood Development (ND)
- Homes
- Cities and Communities

Applicants who choose this method should use the most recent, applicable LEED checklist and have a project designed to achieve at minimum the LEED certification level "Certified" (40-49 points). *Applicants are not required to seek certification through Green Business Certification Inc*. but must provide information that the project is certifiable.

Design buildings to be Energy Star® certifiable

Energy Star® is a joint program of the US Environmental Protection Agency (EPA) and US Department of Energy (DOE) that certifies energy efficient products and building development. Energy Star® building certification compares a building's energy use, design, and operations to similar buildings around the country, on a scale of 1-100 where a score of 50 represents median energy performance and a score of 75 or higher means the proposed building performs better than at least 75% of similar buildings nationwide. For a building to be eligible for Energy Star® certification a building must earn an Energy Star® score of 75 or higher.

Applicants utilizing this method should have a project designed to achieve an Energy Star® score of 75 or higher. *Applicants are not required to seek certification through Energy Star®* but must provide information that the project is certifiable.

Design buildings to be Passive House certifiable or in compliance with the municipal Opt-in Specialized Energy Code

To support state targets for GHG reductions from the building sector, the 2021 "An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy" (M.G.L. c. 25A, § 6) mandated the creation of a municipal opt-in specialized stretch energy code where compliance pathways are consistent with a net-zero economy in 2050. Compliance pathways include all-electric and Passive House building standards.

Passive House design and the opt-in specialized energy code support energy efficiency and decreased energy use.

Information on Massachusetts energy codes can be found at Building Energy Code and more detailed information on Passive House design can be found at PassiveHouse.com.

See Climate Change Technical Bulletin Detailed Description and Resources. *Applicants are not required to seek certification through the Passive House Institute (PHIUS)* but must provide information that the project is certifiable.

Perform a pre-development or redevelopment energy audit

An energy audit can assess building energy use based on existing or proposed building systems and design. An audit can help identify opportunities to reduce energy use or

increase energy efficiency and may include recommendations for building design or systems adjustments to decrease energy use and maximize energy efficiency.

Incorporate building design elements

The aim of this method is to minimize energy consumption and maximize energy efficiency and conservation through building design and the use of energy efficient building systems. Below are example methods consistent with Objective EN3. Applicants are encouraged to propose alternate methods to meet Objective EN3 based on best practices for the type of project proposed, or as new technologies are developed and available.

COMBINED HEATING AND POWER (CHP) SYSTEM

A combined heating and power system is a suite of technologies that can use a variety of fuels to produce electricity and decreasing the amount of fuel needed by using the heat created from the power generation process to provide heating and/or cooling.

More information on combined heat and power can be found through the Department of Energy.

ENERGY EFFICIENT LIGHTING OR APPLIANCES

Energy efficient lighting and appliances can decrease the amount of energy needed to operate lighting or appliances.

WATER EFFICIENT APPLIANCES

Water efficient appliances can decrease the amount of energy needed to operate such appliances.

BUILDING ENVELOPE CONSERVATION MEASURES

Building envelope conservation measures such as insulation and air sealing can improve a building's energy use and efficiency, decreasing the amount of energy needed for heating and cooling systems.

GREEN OR COOL ROOF DESIGN

Green roofs utilize plants to absorb rainwater and cool structures, providing benefits through stormwater management, reducing energy costs for building cooling, and

reducing the heat island effect in the surrounding environment. Green roofs may be extensive or intensive, and may be proposed over the entire roof or a portion thereof. Extensive roofs tend to have lower additional structural requirements, use low growing plants with a shallower medium, and require less maintenance. Intensive green roofs have deeper soil beds to support larger plants, including shrubs and trees, and require greater structural support. Intensive roofs may also serve to help manage stormwater and can serve as a building amenity when designed as a rooftop garden or exterior space. Because there are structural considerations for buildings incorporating green roofs, their applicability is best for new construction[1]. Applicants proposing larger structures in Community Activity Centers and other densely developed areas are encouraged to consider a green roof design to help reduce ambient summer air temperatures.

Cool roofs are designed to reflect, as opposed to absorb, sunlight by applying a light-colored paint, coating or material to the surface of a roof exposed to the sun. A cool roof surface could be as much as 50 degrees cooler than a standard or dark colored roof, thereby reducing the amount of energy needed to cool a building. Cool roofs can decrease building air conditioning needs, lower peak electricity demand, and reduce the local air temperature. Cool roofs can be used in new construction and in certain roof retrofits depending on other building conditions, and can be used on sloped or flat roofs. For certain buildings where a flat roof is incorporated into the design, making the roof reflective, or a "cool roof" is encouraged.

More information about cool roofs can be found through the Department of Energy.

SUB-METERING PER BUILDING UNIT

Submetering is the installation of separate utility meters for multi-tenant buildings or properties, which allows for the measurement and tracking of energy usage by individual users. These systems can give energy users information on the energy use of individual tenants, departments, buildings, specific industrial processes and other loads and encourage energy conservation by providing real-time information on energy usage. Sub-metering is appropriate for commercial, residential, and mixed-use buildings and projects.

[1] https://www.epa.gov/heatislands/using-green-roofs-reduce-heat-islands accessed August 2025

PASSIVE HEATING, COOLING, AND LIGHTING

The location of a building on a site can promote passive heating and lighting, which takes advantage of the sun's orientation to provide additional heating and light to the building. Similarly, a building can be located to avoid excess sunlight and reduce the need for building cooling.

Incorporate Operational Elements

The aim of this method is to minimize energy consumption and maximize energy efficiency and conservation through operational elements. Below are example methods consistent with Objective EN3. Applicants are encouraged to propose alternate methods to meet Objective EN3 based on best practices for the type of project proposed, or as new technologies are developed and available.

SMART THERMOSTATS FOR HEATING AND COOLING

Smart thermostats can be programmed to set temperature controls based on the time of day or building occupancy, heating and cooling spaces as needed for the comfort of building users and decreasing the need for heating and cooling when building spaces are not in use.

PROJECT INCORPORATES SMART AUTOMATION TECHNOLOGY

Similar to smart thermostats, other building systems such as lighting and water use can be programmed to set controls based on the time of day or building occupancy, decreasing the need for lighting or limiting the amount of water use when building spaces are not in use.

GENERAL APPLICATION REQUIREMENTS

Applicants should provide the following materials to address consistency with the Energy Goal and Objectives.

- Narrative description addressing how the project incorporates renewable energy generation or supports Massachusetts' overall approach to a Clean Energy future
- Documentation showing what percentage of project energy use will be purchased through a green power purchase agreement
- Documentation and specifications regarding the type of renewable or alternative energy proposed to be used and the system size in kilowatts (kW), and a projection of the annual kilowatt hours (kWh) of energy this will provide
- Site Plan showing utility locations and appropriate specifications for locating those utilities underground
- A systems safety plan and decommissioning plan for projects whose primary purpose is renewable energy generation
- Documentation and specifications for any proposed energy storage technology system, a narrative describing how the system is incorporated into the building design and operations, a Site Plan showing the proposed energy storage location with appropriate specifications
- Letter from a LEED Accredited Professional describing which certification level the project has been designed to achieve and LEED checklist for appropriate project category
- Statement of Energy Design Intent (SEDI) signed by a licensed professional engineer or architect
- An energy audit of proposed building design and systems for proposed and/or existing conditions, performed by a qualified auditor, which includes recommendations for increased energy efficiency, and a narrative detailing how recommendations from the energy audit will be incorporated into the project design to the maximum extent practicable. Qualified auditors include but are not limited to licensed Professional Engineers, Certified Energy Managers, LEED Accredited Professionals, and Building Performance Institute Analysts.
- A narrative description of selected features relative to building design, site design, or operations
- When proposing a CHP system, Applicants should provide documentation and design specifications regarding the type of system

- A description of the green or cool roof, as applicable, should be included in the project narrative, including a description of the type of system to be installed, vegetation cover types if applicable, and maintenance requirements

REFERENCES AND RESOURCES

Green Energy Consumers Alliance – https://www.greenenergyconsumers.org/

Massachusetts Department of Energy Resources (DOER) – https://www.mass.gov/orgs/massachusetts-department-of-energy-resources

Cape Light Compact – https://www.capelightcompact.org

Massachusetts Clean Energy Center – http://www.masscec.com/

MassSave – https://www.masssave.com/

US Green Building Council – https://new.usgbc.org/

Energy Star – https://www.energystar.gov/

Passive House Institute US (PHIUS) - https://www.phius.org/

ConnectedSolution information through MassSave - https://www.nationalgridus.com/media/pdfs/bus-ways-to-save/connectedsolutions-ciprogrammaterials.pdf

Department of Energy Combined Heat and Power Basics - https://www.energy.gov/eere/iedo/combined-heat-and-power-basics

Department of Energy Cool Roofs - https://www.energy.gov/energysaver/cool-roofs

APPENDIX A

WECF Guidelines and Protocols

To the extent a wind energy conversion facility, wholly located within the jurisdictional limits of Barnstable County, comes to the Commission for DRI review, the following will be considered the minimum siting and design guidelines and operational protocols for such facilities in order to be considered appropriate to context, pursuant to Energy Objective EN1. Renewable energy projects, like wind and solar, are ways to meet the 2025 RPP Energy goal; however, such projects are required to be appropriate to context.

These guidelines and protocols were originally developed with significant public input and review and adopted as revisions to the 2009 Regional Policy Plan Energy Minimum Performance Standards.

The Commission may vary the application of such guidelines and protocols under the particular circumstances of a project, including but not limited to greater setbacks and distances from such facilities.

A wind energy conversion facility (WECF) is equipment, machinery, and structures utilized in connection with the conversion of wind to electricity. This includes, but is not limited to, all transmission, storage, collection and supply equipment, substations, transformers, site access, service roads, and machinery associated with the use. A wind energy conversion facility may consist of one or more wind turbines, and does not include meteorological (or "met") towers.

As used herein, 'receptor' shall mean an occupied property or building.

Because of the unique procedural, legal, and political safeguards applicable to town appropriations and the use of town-owned land, these methods shall not apply to a municipal project proposing a single WECF 250 KW or less on municipally owned land.

- Clear Area: All WECFs shall maintain a Clear Area, free of any structure designed for human occupancy, surrounding the base of the turbine equal to at least 1.5 times the height of the WECF, or the WECF manufacturer's fall zone, setback, or clear area specification, whichever is greater. The Clear Area setback shall be measured from the base of the turbine.

- Noise: An applicant for a WECF greater than 660 KW shall submit a noise study with its DRI application; fund a peer review of the noise study by a consultant of the Cape Cod Commission choosing; and such WECF shall adhere to a setback of 10 times the rotor diameter of the proposed turbine from the nearest receptor, or residentially zoned parcel, unless the applicant can demonstrate through the noise study that the projected sound levels, including both ambient and infrasound, would result in minimal impacts to occupants within a reduced setback. Such applicant shall also provide a plan which specifies reduced operating procedures to address and mitigate noise complaints that may arise during operation of the WECF; this plan shall be consistent with and incorporate recommendations from the Commission's noise consultant.
- Shadow Flicker: An applicant shall submit in its DRI application an impact study of shadow flicker on receptors which will be affected by the proposed WECF. WECFs with anticipated shadow flicker effects on receptors shall require the applicant to provide a mitigation plan to the Commission which specifies operational controls, landscaping, or other means that mitigate shadow flicker events to fewer than 10 hours per year.
- Avoid Adverse Visual Impacts: WECFs shall be sited and designed to avoid adverse visual impacts to scenic resources. A WECF applicant shall provide in its DRI application a Visual Impact Assessment (VIA); guidance on VIAs can be found in Commission Technical Bulletin 12-001.
- Decommissioning: An applicant shall in its DRI application provide a decommissioning plan, which also addresses removal of the meteorological (or "met") tower. Such plan shall include that any WECF that has not been operational for more than 120 consecutive days shall be dismantled and removed and legally disposed of by the owner, operator, or other authorized parties designated in the decommissioning plan. The applicant shall also provide security in a form and amount satisfactory to the Cape Cod Commission to cover the cost of and ensure decommissioning and removal of any abandoned or damaged WECF.