

DRAFT Energy Technical Bulletin

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 these goals 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** – Minimize energy consumption through planning and design (energy efficiency and conservation measures)

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 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 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 and the Technical Guidance.

The project context, as defined by the Placetype of the location, provides the lens through which the Commission will review the project under the RPP. Additional detail can be found in the Cape Cod Placetypes section of the Technical Guidance.



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Note on Application Materials, Definitions, Resources and References

Application materials should provide sufficient detail to demonstrate that the project meets the applicable Objectives, but typically include a project narrative, energy system documentation and specifications, and a detailed site plan. See guidance on page 10 for more information.

A list of references and resources are provided on page 11.

INTRODUCTION

Energy policy and regulation in Massachusetts originates and is largely administered and implemented at the state level. The Commonwealth's Energy Facilities Siting Board is the permitting authority for large scale energy generation, distribution and transmission projects, balancing the relative cost, reliability and environmental impacts in its siting and design review of such infrastructure.

Closely aligned with general energy policy and regulation, Massachusetts also has climate change regulation and policy, which promotes renewable energy sources and greenhouse gas emissions reduction. Massachusetts' Global Warming Solutions Act sets targets on greenhouse gas emissions reduction and contains directives to certain state agencies to act regarding renewable energy development and greenhouse gas emissions reduction. The Massachusetts Green Communities Act 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.

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 (and the larger New England energy grid): 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. Further, the Commission's regional energy policy considerations are broader than, though consistent with, the particular energy issues addressed in the context of its regulatory review for individual projects.

The primary purpose of the Energy Goal and Objectives in the RPP are to ensure an adequate, reliable, and resilient 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. These strategies also mitigate the effects of climate change, important in a coastal region like Cape Cod that is especially susceptible to climate change impacts.

In Section 7 – Coordinated Regional and Local Planning, Renewable Energy Planning and Development, the Commission states preference for energy generation projects that are not located on greenfield sites or in areas of potential natural resource or water resource impacts. The Commission's preference is for on-site renewable energy generation. In the future the Commission will develop specific guidance for the siting and design of on-site renewable energy systems.

This Technical Guidance provides examples of various methods and strategies that DRI projects may use to satisfy the RPPs Energy Goal and Objectives. The Commission recognizes that redevelopment projects have unique development considerations. These methods or 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.

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SUMMARY OF METHODS

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

Methods

- 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), solar thermal, geothermal, solar carport, fuel cells, the use of biofuels
 - In historic districts and other sensitive cultural and scenic areas, roof-top PV and other accessory energy generation installations should be sited and designed to minimize detrimental visual impacts on the surrounding area.

Projects with energy generation as a primary purpose:

- Describe how the project incorporates renewable energy generation or supports Massachusetts’ overall approach to a Clean Energy future
- Considerations in siting and design:
 - Minimize tree clearing/encourage the use of existing developed sites;
 - Adequately screen equipment from public view to avoid detrimental visual impacts;
 - Use non-toxic transformer and other fluids;
 - Locate in areas of similar and compatible types of use and development;
 - Provide stormwater management appropriate to scale of project.

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, fuel cells, emergency backup generator.

Objective EN3 – Minimize energy consumption through planning and design, including energy efficiency and conservation measures

Methods

- Design to earn LEED Certification;
- Design to earn Energy Star® Certification;
- Incorporate building design elements, including but not limited to:
 - Perform a pre-development or redevelopment energy audit, incorporate recommendations to maximum extent practicable
 - Combined Heating and Power (CHP) system
 - Passive heating/cooling/lighting, including building orientation/solar exposure
 - Energy efficient lighting
 - Building envelope conservation measures
 - Green roof
 - Building design meets “Stretch Code”
- Incorporate site design elements, including but not limited to:
 - Electric vehicle charging stations
 - Energy efficient lighting
 - Shade over paved areas using vegetation or structures
 - Provide open grid or permeable pavement
- Incorporate operational elements, including but not limited to:
 - Green vehicles for automobile fleets

DETAILED METHODS FOR MEETING OBJECTIVE EN1

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

The purpose of Objective EN1 is to support an adequate and diverse supply of energy for and to Cape Cod. The following is a discussion of the methods that may be implemented to meet Objective EN1.

DRI Applicants may, in whole or in part, generate their own renewable power or incorporate alternative energy use, purchase renewable or alternative (“green”) power from energy suppliers, or, a combination of both.

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, forwarding 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.

DETAILED METHODS FOR MEETING OBJECTIVE EN2

Objective EN2 – Increase resiliency of energy generation and delivery

The purpose of Objective EN2 is to support the availability of an adequate and diverse supply of energy 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 is a discussion of the methods that may be implemented to meet Objective EN2.

Underground Utilities

DRI Applicants 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

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. 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. 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.

DETAILED METHODS FOR MEETING OBJECTIVE EN3

Objective EN3 – Minimize energy consumption through planning and design, including energy efficiency and conservation measures

The purpose of Objective EN3 is to promote energy conservation, which supports Objectives EN1 and EN2 to promote an adequate and diverse supply of energy for and to Cape Cod. 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 is a detailed discussion of the methods to meet Objective EN3.

Designed to Earn LEED Certification

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

Applicants who choose this method should have a project designed to achieve at minimum the LEED certification level “Certified” (40-49 points). *Applicants do not have to seek certification through Green Business Certification Inc.* but must provide information that the project is certifiable.

Designed to Earn Energy Star® Certification

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 your buildings 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 your 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 do not have to seek certification through Energy Star®* but must provide information that the project is certifiable.

Building Design

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. 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.

Perform a pre-development or redevelopment energy audit

Applicants may perform 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. Qualified auditors include but are not limited to licensed Professional Engineers, Certified Energy Managers, LEED Accredited Professionals, and Building Performance Institute Analysts.

Incorporate a Combined Heating and Power (CHP) system

Applicants may incorporate a CHP system into the project design, which is a suite of technologies that can use a variety of fuels to produce electricity and use the heat created from the power generation process to provide heating and/or cooling.

Green roof

A green roof may be proposed over the entire roof or a portion thereof.

Building design meets "Stretch Code"

The Massachusetts building code is based on the International Energy Conservation Code (IECC). In 2009 Massachusetts became the first state to adopt an above-code appendix to the "base" IECC building energy code, called the Stretch Code. The Stretch Code emphasizes energy performance and is designed to result in cost-effective construction that is more energy efficient than a building built to the "base" energy code.

APPLICATION MATERIALS

As applicable:

- Documentation on what percentage of project energy use will be purchased through a green power purchase agreement. Any green power purchase must have a term of no less than five (5) years. Provide documentation on the term of the purchase.
- Documentation and specifications on what type of renewable or alternative energy will be used, the system size in kilowatts (kW), and a projection of the annual kilowatt hours (kWh) to be offset.
- Site Plan showing utility locations and appropriate specifications for locating those utilities underground.
- Documentation and specifications for energy storage technology systems, a narrative describing how the system is incorporated into the building design and operations, a Site Plan showing energy storage location with appropriate specifications.
- Letter from a licensed LEED Accredited Professional describing which certification level the project has been designed to achieve, a description of the project design, and LEED checklist for appropriate project category.
- Statement of Energy Design Intent (SEDI) signed by a licensed professional engineer or architect.
- An energy audit with a project narrative detailing how recommendations from the energy audit will be incorporated into the project design to the maximum extent practicable.
- A project narrative description of chosen features relative to building design, site design, or operations.
 - When proposing a CHP system, Applicants should provide documentation and design specifications on the type of system.
 - A description of the green roof should be included in the project narrative, including a description of the type of system to be installed, vegetation cover types, and maintenance requirements.
 - A description of how the building has been designed to meet the Stretch Code.

REFERENCES AND RESOURCES

Massachusetts Energy Consumers Alliance – <https://www.massenergy.org>

Massachusetts Department of Energy Resources (DOER) –

<https://www.mass.gov/orgs/massachusetts-department-of-energy-resources>

Massachusetts Green Communities Act –

<https://malegislature.gov/Laws/SessionLaws/Acts/2008/Chapter169>

Massachusetts General Law (MGL) Chapter 25A Section 11F (RPS) and Section 11F1/2 (APS)

Code of Massachusetts Regulations 225 CMR 14 and 15 (RPS), 16 (APS)

2018 'Act to Promote a Clean Energy Future' to date has been approved by MA Senate (S2545)

Guide to Purchasing Green Power, US Environmental Protection Agency, Updated September

2018 – <https://www.epa.gov/greenpower/guide-purchasing-green-power>

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

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

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

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

Code of Massachusetts Regulations 780 CMR (Massachusetts State Building Code)

Code of Massachusetts Regulations 780 CMR Appendix 115.AA (Stretch Energy Code)

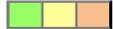
LEED v4 for Building Design and Construction Checklist



LEED v4 for BD+C: New Construction and Major Renovation Project Checklist

Project Name:
Date:

Y ? N



Credit Integrative Process 1

0	0	0	Location and Transportation	16
Credit			LEED for Neighborhood Development Location	16
Credit			Sensitive Land Protection	1
Credit			High Priority Site	2
Credit			Surrounding Density and Diverse Uses	5
Credit			Access to Quality Transit	5
Credit			Bicycle Facilities	1
Credit			Reduced Parking Footprint	1
Credit			Green Vehicles	1

0	0	0	Sustainable Sites	10
Prereq	Y		Construction Activity Pollution Prevention	Required
Credit			Site Assessment	1
Credit			Site Development - Protect or Restore Habitat	2
Credit			Open Space	1
Credit			Rainwater Management	3
Credit			Heat Island Reduction	2
Credit			Light Pollution Reduction	1

0	0	0	Water Efficiency	11
Prereq	Y		Outdoor Water Use Reduction	Required
Prereq	Y		Indoor Water Use Reduction	Required
Prereq	Y		Building-Level Water Metering	Required
Credit			Outdoor Water Use Reduction	2
Credit			Indoor Water Use Reduction	6
Credit			Cooling Tower Water Use	2
Credit			Water Metering	1

0	0	0	Energy and Atmosphere	33
Prereq	Y		Fundamental Commissioning and Verification	Required
Prereq	Y		Minimum Energy Performance	Required
Prereq	Y		Building-Level Energy Metering	Required
Prereq	Y		Fundamental Refrigerant Management	Required
Credit			Enhanced Commissioning	6
Credit			Optimize Energy Performance	18
Credit			Advanced Energy Metering	1
Credit			Demand Response	2
Credit			Renewable Energy Production	3
Credit			Enhanced Refrigerant Management	1
Credit			Green Power and Carbon Offsets	2

0	0	0	Materials and Resources	13
Prereq	Y		Storage and Collection of Recyclables	Required
Prereq	Y		Construction and Demolition Waste Management Planning	Required
Credit			Building Life-Cycle Impact Reduction	5
Credit			Building Product Disclosure and Optimization - Environmental Product Declarations	2
Credit			Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
Credit			Building Product Disclosure and Optimization - Material Ingredients	2
Credit			Construction and Demolition Waste Management	2

0	0	0	Indoor Environmental Quality	16
Prereq	Y		Minimum Indoor Air Quality Performance	Required
Prereq	Y		Environmental Tobacco Smoke Control	Required
Credit			Enhanced Indoor Air Quality Strategies	2
Credit			Low-Emitting Materials	3
Credit			Construction Indoor Air Quality Management Plan	1
Credit			Indoor Air Quality Assessment	2
Credit			Thermal Comfort	1
Credit			Interior Lighting	2
Credit			Daylight	3
Credit			Quality Views	1
Credit			Acoustic Performance	1

0	0	0	Innovation	6
Credit			Innovation	5
Credit			LEED Accredited Professional	1

0	0	0	Regional Priority	4
Credit			Regional Priority: Specific Credit	1
Credit			Regional Priority: Specific Credit	1
Credit			Regional Priority: Specific Credit	1
Credit			Regional Priority: Specific Credit	1

0 0 0 TOTALS Possible Points: 110
 Certified: 40 to 49 points, Silver: 50 to 59 points, Gold: 60 to 79 points, Platinum: 80 to 110

LEED v4 for Building Operations and Maintenance Checklist



LEED v4 for Operations & Maintenance: Existing Buildings Project Checklist

Project Name:
Date:

Y	?	N			
0	0	0	Location and Transportation	15	
			Credit	Alternative Transportation	15

Y	?	N			
0	0	0	Sustainable Sites	10	
			Prereq	Site Management Policy	Required
			Credit	Site Development-Protect or Restore Habitat	2
			Credit	Rainwater Management	3
			Credit	Heat Island Reduction	2
			Credit	Light Pollution Reduction	1
			Credit	Site Management	1
			Credit	Site Improvement Plan	1

Y	?	N			
0	0	0	Water Efficiency	12	
			Prereq	Indoor Water Use Reduction	Required
			Prereq	Building-Level Water Metering	Required
			Credit	Outdoor Water Use Reduction	2
			Credit	Indoor Water Use Reduction	5
			Credit	Cooling Tower Water Use	3
			Credit	Water Metering	2

Y	?	N			
0	0	0	Energy and Atmosphere	38	
			Prereq	Energy Efficiency Best Management Practices	Required
			Prereq	Minimum Energy Performance	Required
			Prereq	Building-Level Energy Metering	Required
			Prereq	Fundamental Refrigerant Management	Required
			Credit	Existing Building Commissioning— Analysis	2
			Credit	Existing Building Commissioning—Implementation	2
			Credit	Ongoing Commissioning	3
			Credit	Optimize Energy Performance	20
			Credit	Advanced Energy Metering	2
			Credit	Demand Response	3
			Credit	Renewable Energy and Carbon Offsets	5
			Credit	Enhanced Refrigerant Management	1

Y	?	N			
0	0	0	Materials and Resources	8	
			Prereq	Ongoing Purchasing and Waste Policy	Required
			Prereq	Facility Maintenance and Renovations Policy	Required
			Credit	Purchasing- Ongoing	1
			Credit	Purchasing- Lamps	1
			Credit	Purchasing- Facility Management and Renovation	2
			Credit	Solid Waste Management- Ongoing	2
			Credit	Solid Waste Management- Facility Management and Renovation	2

Y	?	N			
0	0	0	Indoor Environmental Quality	17	
			Prereq	Minimum Indoor Air Quality Performance	Required
			Prereq	Environmental Tobacco Smoke Control	Required
			Prereq	Green Cleaning Policy	Required
			Credit	Indoor Air Quality Management Program	2
			Credit	Enhanced Indoor Air Quality Strategies	2
			Credit	Thermal Comfort	1
			Credit	Interior Lighting	2
			Credit	Daylight and Quality Views	4
			Credit	Green Cleaning- Custodial Effectiveness Assessment	1
			Credit	Green Cleaning- Products and Materials	1
			Credit	Green Cleaning- Equipment	1
			Credit	Integrated Pest Management	2
			Credit	Occupant Comfort Survey	1

Y	?	N			
0	0	0	Innovation	6	
			Credit	Innovation	5
			Credit	LEED Accredited Professional	1

Y	?	N			
0	0	0	Regional Priority	4	
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1

0	0	0	TOTALS	Possible Points: 110
Certified: 40-49 points, Silver: 50-59 points, Gold: 60-79 points, Platinum: 80+ points				