Ithaca Energy Code Supplement

DRAFT - August 8, 2019

1 Purpose

This energy code supplement provides requirements that are in addition to the requirements of the New York State Energy Conservation Construction Code (NYSECCC). In other words, building design must comply with both the NYSECCC and with this supplement.

Climate change is a real and significant threat to our community, as it is to the nation and the world. The Intergovernmental Panel on Climate Change has indicated that to limit global warming to 1.5°C, we must reduce greenhouse gas (GHG) emissions globally by about 45% by 2030 and that we must achieve carbon-neutrality by 2050 at the latest. The building sector, responsible for more than half of GHG emissions locally, is a critical sector to address. The most affordable and cost-effective time to reduce GHG emissions is when a building is built, rather than at a time of later retrofit. This document establishes a local energy code supplement with requirements above and beyond the state energy code. A separate Reference Manual provides examples and other non-binding resources to support the requirements set forth in this document. More background is provided at www.ithacagreenbuilding.com.

The requirements set forth give priority to electrification, renewable energy, and affordability. Objectives include:

- To deliver measurable and immediate reductions in GHG emissions from new buildings, major renovations, and new additions.
- To promote best practices in the design of affordable buildings to deliver reduced GHG emissions.
- To provide a rapid but orderly transition to buildings that do not use fossil fuels for major building energy needs such as space heating and hot water heating, by 2030. Reductions in GHGs happen in three steps: 2020, 2025, and 2030.

Discussions and implementation of incentives and other support for reducing GHG's are not included in these requirements and will be considered separately.

This local energy code supplement is enabled by state law, as long as it is more stringent than the state Energy Code. Per the 2016 New York State Energy Code Supplement (Revised August 2016): "C107.1.2 More stringent local energy codes. Pursuant to section 11-109 of the New York State Energy Law, and subject to the provisions and requirements of that section, any 2016 Energy Code Supplement (Revised August 2016) Part 1 – Amendments to 2015 IECC Commercial Provisions - Page 14 municipality has the power to promulgate a local energy conservation construction code that is more stringent than the Energy Code."

For the City of Ithaca, this Ithaca Energy Code Supplement forms a part of City Code section 146, Building Permits.

2 Applicability

The requirements of this Ithaca Energy Code Supplement shall apply to:

1) All new construction, excluding additions and major renovations (as defined in this document) that are not specified in this list
2) All new additions 1,000 square feet or larger
3) All new additions 500 square feet or larger to single family homes or duplexes
4) All major renovations, in which over 75% of the space in a building is being renovated and in which two or more of the following major energy components are being substantially renovated: heating, lighting, and envelope.

Two compliance paths are provided:

1. The **Easy Path** emphasizes energy improvements that also reduce construction cost, as well as electrification of building energy systems. This is a point system; a building must meet a minimum of 6 points.
2. The **Whole-Building Path** allows more flexibility in building design. Buildings must comply with any one of several recognized third party green building standards and/or use modeling to show compliance.

In addition to the requirements of the Ithaca Energy Code Supplement, all new buildings shall comply with the New York State Energy Conservation Construction Code.

Grace period: The Ithaca Energy Code Supplement will go into effect six months following adoption.

3 Definitions and Resources

In addition to the following definitions, the following non-mandatory resources are available at www.ithacagreenbuilding.com.

1. Ithaca Energy Code Supplement - Reference Manual
2. Ithaca Green Building Policy - Final Project Report 4/25/18.

ACCREDITED ENERGY PROFESSIONAL - A professional holding a current accreditation in the energy field from BPI, AEE, ASHRAE, RESNET, or other body approved by the Authority Having Jurisdiction, or a licensed design professional (PE or RA).

ADAPTIVE REUSE – The repurposing of a building for a new use (change in occupancy type). Must maintain at least 50% (based on surface area) of the existing building structure and envelope.

AFFORDABILITY IMPROVEMENT – An improvement to a building that reduces both the building's energy use and the building's construction costs. The savings from these improvements tend to persist well over time. Examples of such improvements include building smaller buildings/buildings with smaller

room sizes, placing heating systems within heated spaces, designing buildings with efficient building shapes, right-lighting spaces, and constructing buildings with low window-to-wall ratios.

BENCHMARKING – The measurement of a building's energy use over time, which is then reported and shared.

BIOMASS – Organic material that is processed and burned to provide energy, particularly for space heating through direct thermal energy. Biomass for space heating purposes includes cord wood, pellets, and chips.

CERTIFICATION – Third-party certification programs that use guidelines and specific criteria to evaluate buildings' design, construction, and performance in terms of energy efficiency and environmental sustainability.

- GREEN BUSINESS CERTIFICATION, INC. (GBCI) – An American organization that provides third-party credentialing and verification for several rating systems relating to the built environment, including most prominently LEED.
- HOME ENERGY RATING SYSTEM (HERS) INDEX – A scoring index for residential energy efficiency, developed and administered by RESNET.
- LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED) – A green building rating/certification system, developed by the U.S. Green Building Council (USGBC) and administered by Green Business Certification, Inc. (GBCI).
- NATIONAL GREEN BUILDING STANDARD (NGBS, OR ICC/ASHRAE 700-2015) – A green building rating/certification system approved by the American National Standards Institute (ANSI), under which points can be earned for energy efficiency; water efficiency; resource efficiency; lot development; operation and maintenance; and indoor environmental quality.
- PASSIVE HOUSE – A certification program for buildings constructed to high-performance "passive building standards."
- RESIDENTIAL ENERGY SERVICES NETWORK (RESNET) – The organization that developed and maintains the HOME ENERGY RATING SYSTEM (HERS) index standard.

COMMERCIAL BUILDING - In this document, the term Commercial refers to all buildings covered by the New York Commercial Energy Code EXCEPT residential buildings that are four stories and higher.

CONDITIONED FLOOR AREA – The floor area associated with the conditioned space.

CONDITIONED SPACE – An area or room that is heated or cooled.

DENSITY – For this code, density primarily refers to the number of dwelling units per unit of area. 7 dwelling units per acre is considered the threshold to support frequent transit service and walkable development. Non-residential development can be converted to dwelling units by dividing the area of conditioned space, in square feet, by 1,000. Dwelling units and non-residential square footage area of all

buildings (including existing buildings) on the entire parcel should be counted, and the acreage of the entire parcel should be used in this calculation.

EASY PATH – One possible compliance path for this Code, under which a certain number of points must be earned.

EFFICIENT ELECTRIFICATION – The use of energy-efficient electric technologies that result in lower greenhouse gas emissions than their fossil-fuel counterparts.

FLOOR AREA – The total square footage of all levels as measured from the inside finished surface of the walls, but excluding courts, unconditioned garages, and uninhabitable crawl spaces and attics.

LIGHTING POWER ALLOWANCE (LPA) - Maximum allowed lighting power density.

LIGHTING POWER DENSITY (LPD) - Lighting power consumption per square foot of floor area (watts per square foot).

LOW-RISE RESIDENTIAL BUILDING - A residential building with three stories or fewer

MAJOR RENOVATION – A renovations in which at least 75% of the space in a building is being renovated and in which two out of three major energy systems (heating, lighting, and envelope) are being substantially renovated.

RESIDENTIAL - The term Residential applies to all buildings covered by the New York Residential Energy Code, AND ALSO residential buildings that are four stories and higher that are covered by the New York Commercial Energy Code.

RENEWABLE ENERGY CREDIT (REC)*:* a tradable instrument that represents the environmental attributes of one megawatt hour of renewable electricity generation and is transacted separately from the electricity generated by the renewable energy source. Also known as renewable energy certificate, energy attribute and energy attribute certificate.

SPLIT SYSTEM - A heat pump or air conditioner in which one component is located outdoors and the other component(s) indoors, and which components are connected by refrigerant piping.

WHOLE BUILDING PATH – One possible compliance path for the Ithaca Energy Code Supplement, under which a building must comply with the standards of one of several certification programs and/or use modeling to show compliance.

WINDOW-TO-WALL RATIO – The ratio of a building's exterior glazed (window) area divided by the total area of its exterior envelope walls, expressed as a percentage. Spandrel window assemblies and

windows in front of insulated wall assemblies, which comply with the NYSECCC, do not count as windows in this ratio. Skylights and roof areas also do not form part of this calculation.

4 Compliance Summary

The following tables are summaries of compliance options for residential and commercial buildings, respectively, using either the Easy Path or the Whole Building Path. These are only summaries and should not be considered definitive. Further details are provided following the tables.

Table 1 Residential Compliance Summary

EASY PATH - Buildings must achieve 6 points			
Category	**Improvement**	**Points**	**Details**
EFFICIENT ELECTRIFICATION			
EE1	Heat pumps for space heating	3 - 5	3 points for air source heat pumps. 5 points for ground source heat pumps.
EE2	Heat pumps for domestic hot water heating	1	1 point for water heating systems that use heat pumps.
EE3	Other electrification	1	1 point total for electric stoves AND ventless heat pump clothes dryers. Prerequisite: no fossil fuels in the building.
AFFORDABILITY IMPROVEMENTS			
AI1	Smaller building/room size	1 - 2	1 point for building/room size 15% smaller than reference size. 2 points for building/room size 30% smaller than reference size. Available for Hotels and Residential buildings only.
AI2	Heating systems in heated space	1	1 point for placing heating/cooling systems inside actively heated and finished spaces.
AI3	Efficient building shape	1	1 point if exterior surface area divided by gross floor area is less than maximum value provided in table.
AI4	Right-lighting	NA	Not applicable to Residential buildings.
AI5	Modest window-to-wall ratio	1	1 point for overall window-to-wall ratio less than 20% (individual spaces may exceed 20%).
RENEWABLE ENERGY			
RE1	Renewable energy (non-biomass) systems	1 - 3	Up to 3 points for on-site or off-site renewable electric systems or up to 3 points for on-site renewable thermal systems.
RE2	Renewable energy biomass	5	5 points for approved biomass space heating systems.
OTHER POINTS			
OP1	Development density	1	1 point for density of more than 7 dwelling units per acre.
OP2	Walkability	1	1 point if the building meets the walkability criteria.
OP3	Adaptive reuse	1	1 point for substantial re-purpose of existing building.
OP4	Meet NY Stretch Code	2	2 points for complying with NYStretch Energy Code-2020 Version 1.0
OP5	Custom energy improvement	1 - 2	1 point for each 1.2 kwh/sf/year reduction in energy use. Prerequisite: no fossil fuels in the building.
Whole Building Path			
WB1	Comply with high perform-ance building standard	N/A	See details below.

Table 2. Commercial Compliance Summary

EASY PATH - Buildings must achieve 6 points			
Category	**Improvement**	**Points**	**Details**
EFFICIENT ELECTRIFICATION			
EE1	Heat pumps for space heating	2 - 3	2 points for air source heat pumps. 3 points for ground source heat pumps.
EE2	Heat pumps for domestic hot water heating	NA	Not applicable to Commercial buildings.
EE3	Other electrification	3	3 points for electric stoves in restaurants and other food service buildings that have commercial kitchen hoods.
AFFORDABILITY IMPROVEMENTS			
AI1	Smaller building/room size	1 - 2	1 point for building/room size 15% smaller than reference size. 2 points for building/room size 30% smaller than reference size. Available for Hotels and Residential buildings only.
AI2	Heating systems in heated space	1	1 point for placing heating/cooling systems inside actively heated and finished spaces.
AI3	Efficient building shape	1	1 point if exterior surface area divided by gross floor area is less than maximum value provided in table.
AI4	Right-lighting	1	1 point for reducing overlighting and other lighting improvements.
AI5	Modest window-to-wall ratio	1	1 point for overall window-to-wall ratio less than 20% (individual spaces may exceed 20%).
RENEWABLE ENERGY			
RE1	Renewable energy (non-biomass) systems	1 - 3	Up to 3 points for on-site or off-site renewable electric systems or up to 3 points for on-site renewable thermal systems.
RE2	Renewable energy biomass	3	3 points for approved biomass space heating systems.
OTHER POINTS			
OP1	Development density	1	1 point for density of more than 7,000 SF of non-residential space per acre.
OP2	Walkability	1	1 point if the building meets the walkability criteria.
OP3	Adaptive reuse	1	1 point for substantial re-purpose of existing building.
OP4	Meet NY Stretch Code	1	1 point for complying with NYStretch Energy Code-2020 Ver. 1.0
OP5	Custom energy improvement	1 - 2	1 point for each 2.4 kwh/sf/year reduction in energy use. Prerequisite: no fossil fuels.
Whole Building Path			
WB1	Comply with high perform-ance building standard	N/A	See details below.

5 Note on Fossil Fuels

Various points in the Easy Path require that a building be free of fossil fuels and, furthermore, all buildings are required to be free of fossil fuels in 2030. Such fossil-fuel-free requirements allow exceptions for manufacturing/industrial/process uses, agricultural uses, and cooking. In other words, "free of fossil fuels" applies specifically to the use of fossil fuels for the following applications: space heating (including general space heating and also the heating of all ventilation makeup air, including for hoods), space cooling (e.g absorption chillers), domestic hot water heating, and clothes drying. Where there is a requirement for "fossil-fuel-free," allowed uses of fossil fuels include but are not limited to cooking, emergency generators, and industrial/agricultural processes.

6 Easy Path

A building must achieve a minimum of six (6) points, from among the following points. Points in the Easy Path that are labelled "Residential" apply to all buildings covered by the New York Residential Energy Code, AND ALSO residential buildings that are four stories and higher that are covered by the New York Commercial Energy Code. Points that are labelled "Commercial" apply to all buildings covered by the New York Commercial Energy Code EXCEPT residential buildings that are four stories and higher. Mixed-use buildings, where a portion of the building is residential and a portion of the building is commercial, shall be evaluated based on the criteria for the use that covers a majority of the building's floor area. If more than 50% of the floor area is residential then the buildings shall be scored using residential criteria, if 50% or more of the floor area is commercial then the building shall be scored using commercial criteria.

For compliance with the Easy Path, submit a checklist showing which points are included in the design.

6.1 Points for Efficient Electrification (EE):

EE1 Heat Pumps for Space Heating: 3 points (residential), or 2 points (commercial buildings) - use air source heat pumps. 5 points (residential) and 3 points (commercial) for ground source heat pumps. Water loop boiler/tower heat pumps do not comply, as these heat pumps rely on fossil fuels. Ventilation must also not be fossil-fuel heated. To obtain points for space-heating heat pumps, no fossil fuel backup heat can be used. To allow flexibility for small rooms, electric resistance heat is allowed for up to 10% of the building's projected annual space heating load. Air source heat pumps shall be listed in the NEEP Cold Climate database, for product types/sizes covered by the NEEP requirements (generally, split systems smaller than 65,000 Btu/hr). For air source heat pumps not covered by NEEP, the heat pumps shall operate in heat pump mode to below 0° F, and shall use variable speed compressors.

EE2 Heat Pumps for Domestic Hot Water: 1 point (residential) - The heat pump water heaters shall initially be set on heat pump-only mode.

EE3 Other Electrification: 1 point total for electric stoves AND ventless heat pump clothes dryers (residential, this point requires that the building be free of fossil fuels). 3 points for electric cooking equipment in restaurants and other food service buildings that have commercial kitchen hoods (all cooking equipment must be electric, e.g. ranges, griddles, fryers, etc).

6.2 Affordability Improvements (AI):

AI1 Smaller Building/Room Size (Single Family Homes, Multifamily, or Hotel only): 1 or 2 points - Design to maximum areas in table below. For hotels or multifamily buildings, the size is the weighted average of all units or rooms; individual units or rooms may exceed the requirement. Hotels: 1 point - 280 SF/room, 2 points - 230 SF/room.

Table 3. Maximum heated floor areas, by number of bedrooms, in square feet (SF).

		Number of Bedrooms								
		Studio	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8 or more**
Single Family Homes	**Floor area limit (square feet) - 1 point**	**-**	**850**	**1360**	**1870**	**2380**	**2890**	**3400**	**3910**	**+510 SF per additional bedroom**
	Floor area limit (square feet) - 2 points		**700**	**1120**	**1540**	**1960**	**2380**	**2800**	**3220**	**+420 SF per additional bedroom**
Multi-family Buildings (2 or more units). Area refers to in-unit area only, not common areas.	**Floor area limit (square feet) - 1 point**	**410**	**600**	**840**	**990**	**1160**	**1330**	**1500**	**1670**	**-**
	Floor area limit (square feet) - 2 points	**340**	**490**	**690**	**810**	**950**	**1090**	**1230**	**1370**	**-**

AI2 Heating System in Heated Space: 1 point - Place heating/cooling systems inside actively heated and finished spaces. No heating systems, ductwork, or water piping shall be located in unheated or unfinished basements, in unheated attics, in crawl spaces, outdoors, on roofs, in exterior wall cavities, or through-

wall such as packaged terminal equipment or window-mounted systems. Outdoor units of split system heat pumps may be located outdoors and there are no limitations on the location of refrigerant piping.

AI3 Efficient Building Shape: 1 point - Exterior surface area divided by gross floor area is less than the maximum value provided in the table below. For the exterior surface area, include the above-grade exposed insulated surface, typically including above-grade walls, floor of vented attics (or roofline if insulated at the roof), floors above vented crawl spaces. Include windows and doors as part of walls, include skylights as part of roofs. Include exposed floors, such as below a cantilever. Make the area measurement along the thermal envelope, such as along the wall between heated spaces and unheated spaces that are on the outside of the building, such as the wall between a house and an attached garage. For additions, the area of the shared wall (or floor of the addition, if the addition is above the existing building) is not counted as part of the exposed above-ground wall/roof area.

Table 4. Maximum wall plus roof to floor area ratio

Gross Floor Area (SF)	Maximum (wall+roof)/floor area ratio	Gross Floor Area (SF)	Maximum (wall+roof)/floor area ratio	Gross Floor Area (SF)	Maximum (wall+roof)/floor area ratio
100-199	4.7	1500-1599	2.1	10000-14999	1.05
200-299	3.9	1600-1699	2.1	15000-19999	0.94
300-399	3.5	1700-1799	2.0	20000-29999	0.84
400-499	3.2	1800-1899	2.0	30000-39999	0.75
500-599	3.0	1900-1999	2.0	40000-49999	0.68
600-699	2.8	2000-2499	1.9	50000-59999	0.64
700-799	2.7	2500-2999	1.7	60000-69999	0.61
800-899	2.7	3000-3999	1.6	70000-79999	0.58
900-999	2.6	4000-4999	1.5	80000-89999	0.55
1000-1099	2.5	5000-5999	1.4	90000-99999	0.53
1100-1199	2.4	6000-6999	1.3	100,000-199,999	0.46
1200-1299	2.3	7000-7999	1.2	200,000-299,999	0.39
1300-1399	2.2	8000-8999	1.2	300,000-399,999	0.35
1400-1499	2.2	9000-9999	1.1	> 400,000	0.33

AI4 Right Lighting: 1 point - Commercial buildings only. All requirements of this section must be met (e.g. reduced overlighting AND lighting controls) in order to obtain the point.

Reduce overlighting by using 50% lower lighting power density (LPD) than required by the New York State Energy Conservation Construction Code, 2016. The required lighting power allowances are specified in Table 8 (see Appendix A).

Perform photometric lighting design on a space-by-space basis, using the space-by-space lighting power density method (not the whole-building method). Construction documents shall include a table of space-by-space as-designed lighting power density along with the lighting power allowance from Table 8.

For the Space-by-Space Method, the allowable lighting power is determined by multiplying the floor area of each space times the value for the space type in the lighting table that most closely represents the proposed use of the space, and then summing the allowable lighting power for all spaces to calculate the allowable total lighting power. Trade-offs among spaces are permitted.

Motion sensors are required for all exterior lighting, combined with photocells to ensure that lighting stays off during the day. Motion sensors are required for interior lighting in the following spaces: offices, conference rooms, kitchenettes, corridors, stairwells, bathrooms, lobbies. Short off-delay (1 minute or less) is required for motion sensors. Provide for manual control to allow lights to be kept off.

Commissioning of lighting and lighting controls is required. A commissioning plan shall be developed by a *registered design professional* or *approved agency* and shall include the following items:

1. A narrative description of the activities that will be accomplished during each phase of commissioning, including the personnel intended to accomplish each of the activities.
2. A listing of specific lighting and controls to be tested and a description of the tests to be performed.
3. Functions to be tested including, but not limited to, lighting power density (to show compliance with lighting power allowance requirements) and control settings.
4. Conditions under which the tests will be performed.
5. Measurable criteria for performance.

A commissioning report, consistent with the commissioning plan, shall be submitted prior to the Certificate of Occupancy being issued.

Additional interior lighting power. Where using the Space-by-Space Method, an increase in the interior lighting power allowance is permitted for specific lighting functions. Additional power shall be permitted only where the specified lighting is installed and automatically controlled separately from the general lighting, to be turned off during non-business hours. This additional power shall be used only for the specified luminaires and shall not be used for any other purpose. An increase in the interior lighting power allowance is permitted in the following cases:

1. For lighting equipment to be installed in sales areas specifically to highlight merchandise, the additional lighting power shall be determined in accordance with Equation 4-10. Additional interior lighting power allowance = 500 watts + (Retail Area 1 * 0.6 W/ft2) + (Retail Area 2 * 0.6 W/ft2) + (Retail Area 3 * 1.4 W/ft2) + (Retail Area 4 * 2.5 W/ft2) (Equation 4-10)
   Where:
   Retail Area 1 = The floor area for all products not listed in Retail Area 2, 3 or 4
   Retail Area 2 = The floor area used for the sale of vehicles, sporting goods and small electronics.
   Retail Area 3 = The floor area used for the sale of furniture, clothing, cosmetics and artwork.

Retail Area 4 = The floor area used for the sale of jewelry, crystal and china. **Exception:** Other merchandise categories are permitted to be included in Retail Areas 2 through 4, provided that justification documenting the need for additional lighting power based on visual inspection, contrast, or other critical display is approved by the code official.

2. For spaces in which lighting is specified to be installed in addition to the general lighting for the purpose of decorative appearance or for highlighting art or exhibits, provided that the additional lighting power shall be not more than 1.0 w/ft2 (10.7 w/m2) of such spaces.

AI5 Modest Window-to-Wall Ratio: 1 point - Overall window-to-wall ratio less than 20%. For calculations, include glazed portions of doors in the window area, but not opaque portions of doors. Include glazed portions of curtain walls, but not spandrel/opaque areas.

6.3 Renewable Energy (RE):

RE1 Renewable Energy (Non-Biomass) System: Up to 3 points

On-site and off-site renewable energy systems that meet the requirements of this section will earn points based on their annual electrical or thermal production, as displayed in tables 5,6, and 7, below. Renewable energy systems shall produce electricity from solar, wind, hydroelectric, or biomass, or produce thermal energy from solar. No more than three total points may be earned for any combination of renewable energy systems in this category.

Documentation for contractual commitment to ownership or procurement of, or other long-term commitment to, renewable energy system(s) shall be submitted to the code department/building division. All contracts shall have a duration of not less than 20 years, and shall be structured to survive a partial or full transfer of ownership of the property. Where the renewable energy producer ceases operation, the building owner shall produce or procure alternative qualifying renewable energy.

Records on power sent to or purchased by the building project from the off-site renewable energy producer that specifically assign power production to the building project shall be retained by the building owner and made available for inspection by the code department/building division upon request.

Documentation shall be provided to the code department/building division that indicates that there is an exclusive chain of custody and ownership of the Renewable Energy Credits (RECs) from the renewable energy system to the building owner. RECs shall be conveyed and retired on behalf of the entity(s) that has financial or operational control over the building's electricity consumption. If chain of custody of the REC cannot be verified, or if the project otherwise demonstrates to the code department/building division that they cannot convey and retire the RECs associated with the renewable energy system(s), the project shall contract for renewable electricity products complying with the Green-e Energy National Standard for Renewable Electricity products of not less than 100% of the modeled annual energy usage multiplied by

20 years. A combination of renewable electricity products and renewable energy systems shall be permitted to demonstrate compliance.

Where multiple buildings are served by the same renewable energy system, or are allocated energy procured by a single contract subject to this section, the owner shall allocate for not less than 20 years the energy produced or procured from the system to the buildings served by the system. Renewable energy production or procurement that is not allocated before issuance of the certificate of occupancy is permitted to be reserved for future use, for allocation to other buildings constructed within five years. Allocation shall be documented as part of the building project and shall be retained by the building owner and made available for inspection by the code department/building division upon request.

Annual reporting, where required, shall be provided for a minimum of five years. Deployment of renewable systems must occur within one year of the certificate of occupancy. If off-site renewable energy generation is not associated with a specific building and electric meter, the developer shall maintain an allocation of production with each building and electric meter, for reporting purposes.

Qualifying renewable energy sources are as follows:
a. On Site Renewable Energy System
b. Directly Owned Off-Site Renewable Energy System – an offsite renewable energy system owned by the building project owner.
c. Community Renewable Energy Facility
d. Purchase contract (PPA) – a power purchase agreement for offsite renewable energy, where the owner agrees to purchase renewable energy output at a fixed price schedule.

The generation source shall be located where the energy can be delivered to the building site by any of the following:
a. By direct connection to the renewable energy facility
b. By the local utility or distribution entity
c. By an interconnected electrical network where energy delivery capacity between the generator and the building site is available (Informative Note: Examples of interconnected electrical networks include regional power pools and regions served by Independent System Operators or Regional Transmission Organizations.)

Note: Non-biomass renewable energy points are capped at three (3) points maximum as detailed in the tables below. The maximum will rise to six (6) points on January 1, 2025.

Table 5. On-site Renewable Electricity Systems

On-site Renewable Electricity Systems E.g. building-mounted solar photovoltaics		
Building Type	**Annual Electric Production (kwh/sf)**	**Points Earned**
Residential	1.20 - 2.39	1
Residential	2.40 - 3.59	2
Residential	at least 3.6	3
Commercial	2.40 - 4.79	1
Commercial	4.80 - 7.19	2
Commercial	at least 7.2	3

Table 6. Off-site Renewable Electricity Systems

Off-site Renewable Electricity Systems E.g. Community solar		
Building Type	**Annual Electric Production (kwh/sf)**	**Points Earned**
Residential	1.60 - 3.19	1
Residential	3.20 - 4.79	2
Residential	at least 4.8	3
Commercial	3.20 - 6.39	1
Commercial	6.40 - 9.59	2
Commercial	at least 9.6	3

Table 7. Renewable Thermal Systems

Renewable Thermal Systems E.g. solar domestic hot water		
Building Type	**Annual Thermal Production (kBtu/sf)**	**Points Earned**
Residential	4.0 - 7.9	1
Residential	8.0 - 11.9	2
Residential	at least 12	3
Commercial	8.0 - 15.9	1
Commercial	16.0 - 23.9	2
Commercial	at least 24	3

RE2 Renewable Energy Biomass: 3 points (Commercial) or 5 points (Residential) - Use a biomass space heating system. All eligible biomass equipment must comply with NYSERDA's Renewable Heat NY guidelines. To obtain points for biomass space-heating, no fossil fuel backup heat can be used.

6.4 Other Points (OP):

OP1 Development Density: 1 point for lots developed at more than 7 dwelling units per acre density. Non-residential development can be converted to dwelling units by dividing the area of conditioned space, in square feet, by 1,000. Dwelling units and non-residential square footage area of all buildings (including existing buildings) on the entire parcel should be counted, and the acreage of the entire parcel should be used in this calculation.

OP2 Walkability: 1 point for being within 1/4 mile of at least five Use Types, where no more than two uses in each Use Type may be counted, and where at least two Use Categories must be represented. Use types and categories are described below.

OR

1 point for being within a Town development priority area, if a regulating plan has been developed and adopted.

For all projects, at the time of project completion, sidewalks, walkways and/or trails must be present on the property, along with connection to an existing network of pedestrian infrastructure.

USE TYPES AND CATEGORIES

Use Category: Food retail
- Supermarket
- Grocery with produce section

Use Category: Community-serving retail
- Convenience store
- Farmers market
- Hardware store
- Pharmacy
- Other retail

Use Category: Services
- Bank
- Family entertainment venue (e.g., theater, sports)
- Gym, health club, exercise studio
- Hair care

- Laundry, dry cleaner
- Restaurant, café, diner (excluding those with only drive-thru service)

Use Category: Civic and community facilities
- Adult or senior care (licensed)
- Child care (licensed)
- Community or recreation center
- Cultural arts facility (museum, performing arts)
- Education facility (e.g., K–12 school, university, adult education center, vocational school, community college)
- Government office that serves public on-site
- Medical clinic or office with medical facility
- Place of worship
- Post office
- Public library
- Public park
- Social services center

OP3 Adaptive Reuse: 1 point - When an existing building structure is retained in place and is re-purposed for a different use (for example, when an old school is adapted for use as apartments). A major renovation of a building and re-use for the same purpose (e.g. old apartments are renovated) is not eligible for this point. Maintain at least 50% (based on surface area) of the existing building structure and envelope.

OP4 Meet NY Stretch Code: 1 point (Commercial), 2 points (Residential) - Comply with the NYStretch Energy Code-2020 Version 1.0.

OP5 Custom Energy Improvement: 2 points - Can only be applied to buildings that do not use fossil fuels. Reduce energy use by 1.2 kwh/SF/year per point (residential buildings) or 2.4 kwh/SF/year per point (commercial buildings). Cannot be provided by renewable energy savings. Savings must be shown through energy analysis performed by an accredited energy professional. For a baseline, use the NYS Energy Conservation Construction Code (NYSECCC), 2016. If the baseline condition is not addressed by the NYSECCC, use baseline conditions as defined in ASHRAE Standard 90.1-2013, or RESNET HERS (latest edition). Savings must be calculated after applying all other proposed energy improvements to the proposed design. In other words, interactive energy savings must be performed. Simplified calculations (e.g. spreadsheet) are acceptable. Multiple improvements may be combined to achieve each point under this improvement. The proposed energy improvement shall be submitted to the code department/building division in writing, signed by the experienced energy professional or licensed design professional.

7 Whole Building Path (WB1)

In lieu of using the Easy Path, the developer can choose to comply with one of the following whole-building high-performance approaches:

1. For commercial buildings, 17 energy points (Optimize Energy Performance) based on LEED Version 4, to be demonstrated either with LEED review/certification or by other approved third party certification of the energy model, such as NYSERDA. The energy model (printed complete input and output reports) shall be submitted with the design documents with the application for a building permit, with a statement by the energy modeler that the energy model meets the requirements for 17 energy points based on LEED Version 4.
2. For low-rise residential buildings, RESNET HERS/ERI (with a maximum score of 40). Compliance shall follow procedures defined for the ERI compliance path in the New York State Energy Conservation Code.
3. For residential buildings (single-family, multifamily low-rise or high-rise): National Green Building Standard ("NGBS", also known as ICC/ASHRAE 700-2015) with a minimum of 80 NGBS Energy Efficiency points. The professional documenting compliance will provide a statement that the design meets the intent of a minimum 80 Energy Efficiency points per ICC/ASHRAE 700-2015, and documentation supporting these points.
4. For commercial or residential buildings, Passive House. Submit approved pre-certification from either PHIUS or Passive House International, according to current-version standards of either organization, when submitting construction documents in application for a building permit.
5. Carbon Calculation Method: For commercial or residential buildings, demonstrate a minimum 40% reduction in carbon emissions, through energy modeling. For commercial buildings, energy modeling shall comply with Appendix G of ASHRAE Standard 90.1-2013. For low-rise residential buildings, energy modeling shall comply with RESNET-HERS. The carbon reduction assessment and requirement shall exclude energy use by process loads (such as the energy used for commercial cooking, the energy used for specialty equipment such as industrial machinery), but the energy model shall include the energy used for these process loads because energy used by heating, ventilation (including exhaust fans/hoods, makeup air fans, and heating/cooling for makeup air) is subject to the carbon reduction requirement. The following greenhouse gas emissions factor shall be used: 545.79 lb CO2/MWh, except for electricity from combined heat and power plants, for which the most recent factor shall be used from https://www.eia.gov/electricity/annual/html/epa_08_02.html, for the specific type of generation plant used, for electricity used the proposed building. For combined heat and power plants, the baseline (reference building) electricity use carbon emissions shall be the same as for buildings not served by a combined heat and power plant.

On-site or off-site (remote) renewable energy generation is allowed for compliance using one of the Whole Building options. All requirements for renewable energy systems described in Easy Path point RE1 (Renewable Energy (Non-Biomass) System) must be met.

8 Renovations and Additions

For all major renovations, in which over 75% of the space in an existing building is being renovated and in which at least two out of three major energy components (heating, lighting, and envelope) are being substantially renovated, the renovation shall comply with the requirements for new buildings (Easy Path or Whole Building Path).

For all additions over 500 square feet (single-family and duplex) and over 1,000 square feet (all other building types), additions may comply in any one of three ways:

1. Independent of the existing building. Demonstrate compliance for the addition alone either with the Whole Building path or the Easy Path. Additions shall be treated on their own, and not as part of a larger building. For the window area point, treat the shared wall area (where the addition meets the existing building) as part of the new addition's exterior wall. For the building shape point, the area of the shared wall (or floor of the addition, if above the existing building) is not counted as part of the exposed above-ground wall/roof area.
2. Together with the existing building, as a whole. Demonstrate compliance with the Whole Building Path or the Easy Path.
3. Together with the existing building, as a whole, by showing that the proposed design will have lower carbon emissions than the existing building. Submit an energy audit of the existing building, including existing energy use over at least one recent year and anticipated energy use for the new addition and modified existing building. Calculate current and proposed carbon emissions using the Carbon Calculation Method (see Whole Building). Results shall be in a report, accompanied by a letter stating that proposed carbon emissions for the building and addition are less than existing carbon emissions for the existing building, signed and stamped by an accredited energy professional.

9 Exemptions

Consistent with the New York State energy code, historic buildings are exempt from the Ithaca Energy Code Supplement. In renovation of a historic building, steps to reduce carbon emissions are encouraged that preserve the historic fabric of the building, such as rehabilitation of windows, installation of heat pumps for space and water heating, insulation and air sealing, high-efficiency lighting where lighting needs to be replaced, and, where appropriate, renewable energy systems.

10 Future

On January 1, 2025, the requirements shall change to:

1. Easy path: 12 points. Note: Points from the Efficient Electrification section are doubled.
2. Whole building path:

a. LEED: 17 energy points (LEED version 4) AND 7 of the Easy Path points (excluding the Stretch Energy Code and lighting point)
b. 80% less energy than ASHRAE 90.1-2013, using Performance Rating Method. Energy model and achievement of 80% goal shall be certified by an independent third party.
c. HERS Score Maximum 40, AND 7 of the Easy Path points (excluding the Stretch Energy Code and lighting point), OR a HERS Score Maximum 20
d. National Green Building Standard ("NGBS", also known as ICC/ASHRAE 700-2015) with a minimum of 80 NGBS Energy Efficiency points, AND 7 of the Easy Path points (excluding the Stretch Energy Code and lighting point)
e. Passive House
f. 80% reduction in carbon emissions using the Carbon Calculation method. The following greenhouse gas emissions factor shall be used: 295.9 lb CO2/MWh, except for electricity from combined heat and power plants, for which the most recent factor shall be used from https://www.eia.gov/electricity/annual/html/epa_08_02.html, for the specific type of generation plant used.

On January 1, 2030, the requirements shall further change to net-zero building designs that are free of fossil fuels for space heating, water heating, or clothes drying. The standard by which net-zero is defined will be established before January 1, 2024. In the absence of such a standard being defined, the following standards will be used:

a. For commercial buildings and for residential buildings four stories and higher: The Zero Code (https://zero-code.org/).
b. For residential buildings three stories and lower (including low-rise multifamily buildings): RESNET HERS, with a HERS score of 5 or lower.

11 Compliance, Enforcement, and Appeals

A successful green building policy is one that does not place a significant burden on those who will review and approve building planning, design, and construction. The following compliance documentation shall be submitted:

1. For the proposed point system, a checklist that shows which points are sought, and support for each point. For example, if a developer is seeking the size credit for a house design, the checklist would show the house area (square feet), number of bedrooms, required house size, and proposed house size, to show that the house meets the size requirement.
2. For the proposed whole-building compliance, a report by an accredited energy professional, at the time of planning review and again when applying for a building permit.

At the planning review phase, a preliminary green building checklist shall be submitted, indicating which green compliance items are proposed/planned. A checklist shall be submitted with the construction documents, prior to the building department issuing the building permit.

Non-compliance with the Ithaca Energy Code Supplement during construction is grounds for the code department/building division to withhold a Certificate of Occupancy.

Appeals

The review board that will consider appeals for this regulation will be the [Building Code Board of Appeals?] for the City of Ithaca and the [name of body] for the Town of Ithaca. Smaller issues may be approved at the staff level.

12 Appendix A - Lighting Power Allowances (LPA)

Table 8 below provides the Lighting Power Allowances (LPA), by space type, that are used to determine compliance with Easy Path point AI4, Right Lighting.

Table 8. Interior Lighting Power Allowances

COMMON SPACE TYPES[a]	LPA (watts/sq. ft)
Atrium	
Less than 40 feet in height	0.015 per foot in total height
Greater than 40 feet in height	0.2 + 0.01 per ft in total height
Audience seating area	
In an auditorium	0.32
In a convention center	0.41
In a gymnasium	0.33
In a motion picture theater	0.57
In a penitentiary	0.14
In a performing arts theater	1.22
In a religious building	0.77
In a sports arena	0.22
Otherwise	0.22
Banking activity area	0.51
Breakroom (See Lounge/Breakroom)	
Classroom/lecture hall/training room	
In a penitentiary	0.67
Otherwise	0.62
Conference/meeting/multipurpose room	0.62
Copy/print room	0.36
Corridor	
In a facility for the visually impaired (and not used primarily by the staff)[b]	0.46
In a hospital	0.40
In a manufacturing facility	0.21
Otherwise	0.33
Courtroom	0.86
Computer room	0.86
Dining area	
In a penitentiary	0.48
In a facility for the visually impaired (and not used primarily by the staff)[b]	0.95
In bar/lounge or leisure dining	0.54
In a cafeteria or fast food dining	0.33

In family dining	0.45
Otherwise	0.33
Electrical/mechanical room	0.48
Emergency vehicle garage	0.28
Food preparation area	0.61
Guest room	0.24
Laboratory	
In or as a classroom	0.72
Otherwise	0.91
Laundry/washing area	0.30
Loading dock; interior	0.24
Lobby	
In a facility for the visually impaired (and not used primarily by the staff)[b]	0.90
For an elevator	0.32
In a hotel	0.53
In a motion picture theater	0.30
In a performing arts theater	1.00
Otherwise	0.45
Locker room	0.38
Lounge/Breakroom	
In a healthcare facility	0.46
Otherwise	0.37
Office	
Enclosed	0.56
Open plan	0.49
Parking area	0.10
Pharmacy area	0.84
Restroom	
In a facility for the visually impaired (and not used primarily by the staff)[b]	0.61
Otherwise	0.49
Sales area	0.80
Seating area, general	0.27
Stairway (See space containing stairway)	
Stairwell	0.35
Storage room	0.32
Vehicular maintenance area	0.34
Workshop	0.80
BUILDING TYPE SPECIFIC SPACE TYPES[a]	**GBP LPA (watts/sq.ft)**
Facility for the visually impaired[b]	

In a chapel (and not used primarily by the staff)	1.11
In a recreation room (and not used primarily by the staff)	1.21
Automotive (See Vehicular Maintenance Area above)	
Convention Center-exhibit space	0.73
Dormitory-living quarters	0.19
Fire Station-sleeping quarters	0.11
Gymnasium/fitness center	
In an exercise area	0.36
In a playing area	0.60
Healthcare facility	
In an exam/treatment room	0.83
In an imaging room	0.76
In a medical supply room	0.37
In a nursery	0.44
In a nurse's station	0.36
In an operating room	1.24
In a patient room	0.31
In a physical therapy room	0.46
In a recovery room	0.58
Library	
In a reading area	0.53
In the stacks	0.86
Manufacturing facility	
In a detailed manufacturing area	0.65
In an equipment room	0.37
In an extra high bay area (greater than 50' floor-to-ceiling height)	0.53
In a high bay area (25-50' floor-to-ceiling height)	0.62
In a low bay area (less than 25' floor-to-ceiling height)	0.60
Museum	
In a general exhibition area	0.53
In a restoration room	0.51
Performing arts theater-dressing room	0.31
Post Office-Sorting Area	0.47
Religious buildings	
In a fellowship hall	0.32
In a worship/pulpit/choir area	0.77
Retail facilities	
In dressing/fitting room	0.36
In a mall concourse	0.55
Sports arena-playing area	

For a Class I facility	1.84
For a Class II facility	1.20
For a Class III facility	0.90
For a Class IV facility	0.60
Transportation facility	
In a baggage/carousel area	0.27
In an airport concourse	0.18
At a terminal ticket counter	0.40
Warehouse-storage area	
For medium to bulky, palletized items	0.29
For smaller, hand-carried items	0.48

a. In cases where both a common space type and a building area specific space type are listed, the building area specific space type shall apply.

b. A 'Facility for the Visually Impaired' is a facility that is licensed or will be licensed by local or state authorities for senior long-term care, adult daycare, senior support or people with special visual needs.