

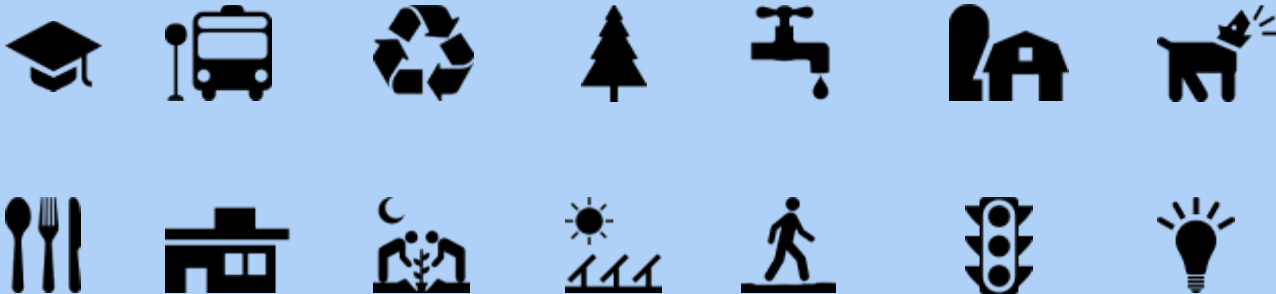


Stretch Energy Codes: Helping Practitioners Reach the Moon Ithaca Green Building Policy



**NICK GOLDSMITH, SUSTAINABILITY COORDINATOR
CITY OF ITHACA AND TOWN OF ITHACA**

BUILDINGENERGY NYC, OCTOBER 4, 2018





Agenda



Ithaca Green Building Policy

- Background
- Recommendations
- The Easy Path
- Next Steps





Background



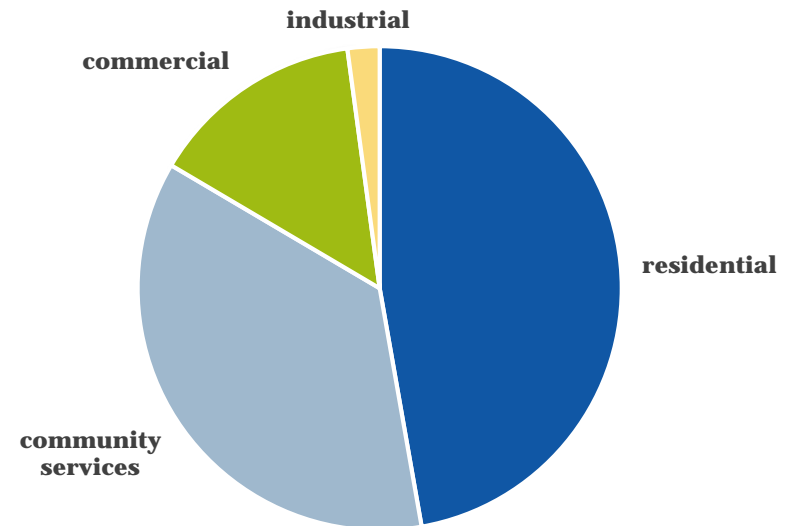


Background

- City and Town are separate municipalities
- 37 square miles
- Total population of 50,000+
- Student population about 30,000
- 60% renters
- Median household income \$46,360



Building Stock (sq. ft.)

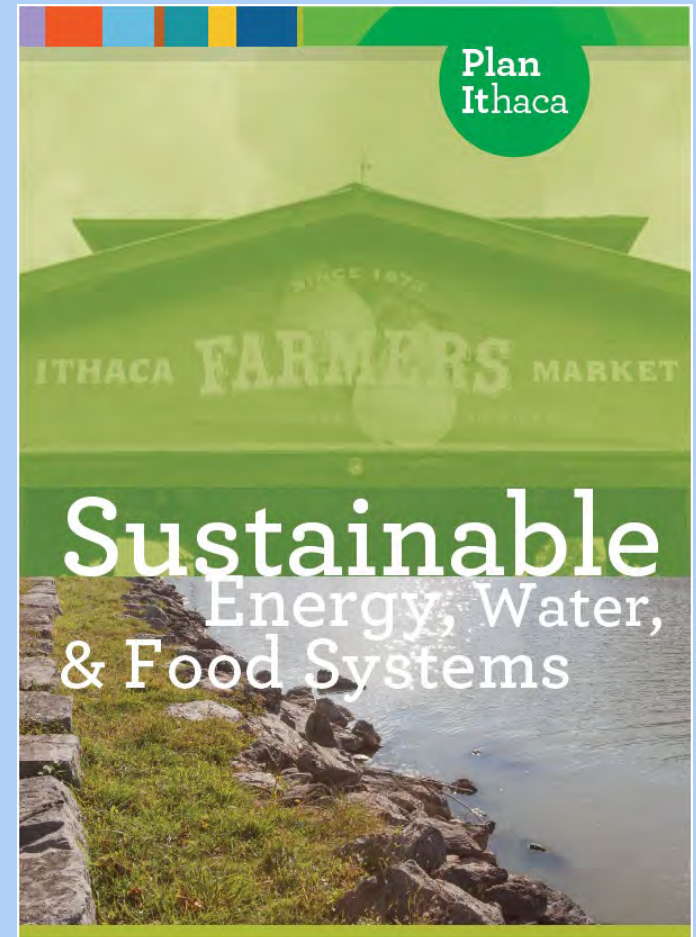




Background



- Climate action at state and local government level now more important than ever
- Ithaca has a history of sustainability efforts





Background



Green Building Policy Project

- Grant-funded
- Broad scope
- Collaborative – City and Town of Ithaca
- Oversight and guidance



Criteria of a Successful Green Building Policy



A successful green building policy should be **FAIR**

- 1. Flexible**
- 2. Affordable**
- 3. Impactful**
- 4. Reachable**



Possible Actions



	Approach	Examples	Penetration
8 Carrot	Incentivize	Tax credits, rebates	12% penetration for Energy Star homes, 2% penetration for solar.
7 ↑	Recognize	Energy Star, LEED, Architecture 2030 / District 2030	2-3% for LEED.
6 ↑	Encourage	Bulk purchasing, Solarize, HeatSmart, model behavior by targeting net-zero for new city buildings	Solarize and HeatSmart have so far seen market penetration below 1%.
5 ↑	Finance	PACE, performance contracting, other	PACE no market penetration yet.
4 ↑	Support	Training (contractors, building operators, building code officials, others), Cooperative Extension navigators	
3 ↓	Advocate	Web sites, Green Building Tour, discourage fossil fuels	
2 ↓	Pressure	Require energy score to be shown on listings, benchmarking	
1 Stick	Require	Code requirements, ordinances	U.S. DOE estimates 80-90% compliance

Take-aways

- Encouraged to use a Balanced approach.
- Can not reach our goals with only softer approaches that are not mandatory.



Recommendations





Recommendations



Mandate

- New buildings must meet energy efficiency requirements

Incentives

- Broad incentive package proposed to promote early adoption of best practices

Future Code Cycles

- Requirements become more stringent in 2025 and 2030



Recommendations



A mandate with two compliance options

Whole Building Path

-OR-

Easy Path

- **Third-party verified**
- **LEED: 17 energy points (Commercial)**
- **Passive House (Comm./Residential)**
- **HERS Rating of 40 (Residential)**
- **NGBS with 80 EE points (Residential)**

- **Point system**
 - Achieve minimum of 6 points to pass
 - Easy to use
 - Emphasis on affordability-driven features and electrification



Incentives

Incentive package proposed for projects that:

- Meet requirements of the next code cycle
- Fossil fuel free
- Meet walkability criteria
- Commit to share energy use data

Incentive package

- Recognition
- Property Tax abatements
 - Green Building Tax Exemption
- Additional square footage
 - Height, stories, lot coverage, parking requirements
- Building Permit relief
 - e.g. streamline; cost reduction or rebate



Future Code Cycles



2019: Base requirements with incentives for reaching 2025 requirements

2025: Requirements increase with incentives for reaching 2030 requirements

2030: Requires net-zero carbon buildings



When Would This Policy Apply?



Proposed policy would cover:

- All new construction (residential, commercial, industrial, etc.)
- Gut renovations
- Additions over 500 square feet

NYS Stretch Energy Code would cover:

- New additions less than 500 sq ft
- Limited renovations

Historic buildings are exempt from policy, but encouraged to reduce carbon emissions.



The Easy Path





Can you get six points?

Efficient Electrification

- Heat pumps for space heating
- Heat pumps for domestic hot water heating
- Electric stove and heat pump dryer and no fossil fuels in building

2 - 4 points

1 point (residential/hotel only)

1 point (residential/hotel only)

Affordability Improvements

- Smaller building/room size
- HVAC system and distribution in heated space
- Efficient building shape
- Right-lighting
- Window-to-wall ratio: 20% overall

1 - 2 points (resid./hotel only)

1 point

1 point

1 point (commercial only)

1 point

Renewable Energy

- Renewable energy system
- Biomass system

1 - 3 points

3 - 4 points

Other Points

- Development Density
- Walkability
- Adaptive reuse
- Meet NY Stretch Energy Code
- Custom energy Improvement (no fossil fuels)

1 point

1 point

1 point

1 point

1 - 2 points



Efficient Electrification



EE1 Heat pumps for space heating

Electric heat pumps are more energy efficient than fossil fuel based space heating equipment.

Requirement:

Heat pumps for space heating

Possible Points: 2-4

2 points (Commercial) or 3 points (Residential) for air source heat pumps. 3 points (Commercial) or 4 points (Residential) for ground source heat pumps.





Efficient Electrification

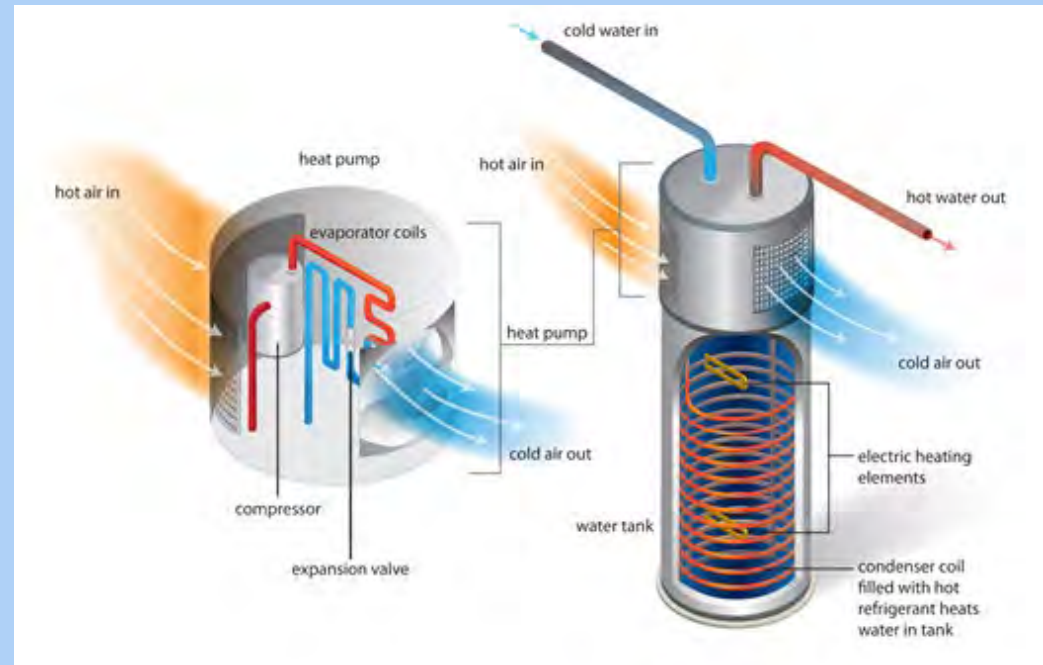
EE2 Heat pumps for water heating

Electric heat pumps are more energy efficient than fossil fuel based water heating equipment.

Requirement:

Water heating systems that use heat pumps (Residential, Hotels, and Dorms).

Possible Points: 1





Efficient Electrification

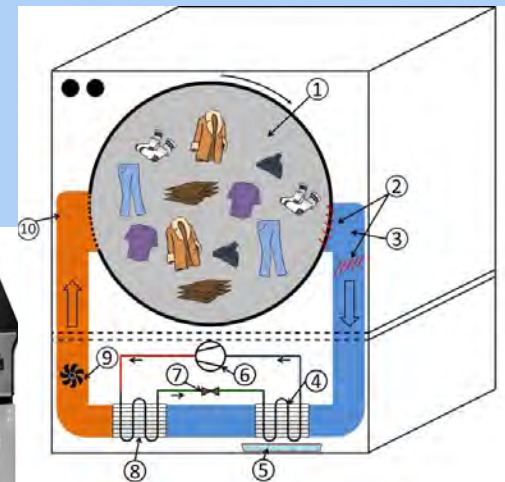
EE3 Electric stove and ventless heat pump clothes dryer

Electric stoves and heat pumps clothes dryers are more energy efficient than fossil fuel based equipment.

Requirement:

Electric stoves AND ventless heat pump clothes dryers. Requires no fossil fuels in the building. (Residential).

Possible Points: 1





Affordability Improvements

AI1 Smaller building size

A smaller building uses both less energy and costs less. The impact of smaller buildings on energy use is almost linear, due to energy uses that scale with size: heating, cooling, lighting, etc.:

Requirement:

15% smaller = 1 point

30% smaller = 2 points

Residential and Hotels only

Possible Points: 1-2

Example: Single Family Homes*

Floor area (sq. ft.) per Number of Bedrooms

	1	2	3	4	
	1,000	1,600	2,200	2,800	

LEED/EnergyStar's reference table for conditioned floor area of reference home, by number of bedrooms.

*Different tables are used for multifamily buildings and hotels.



Affordability Improvements

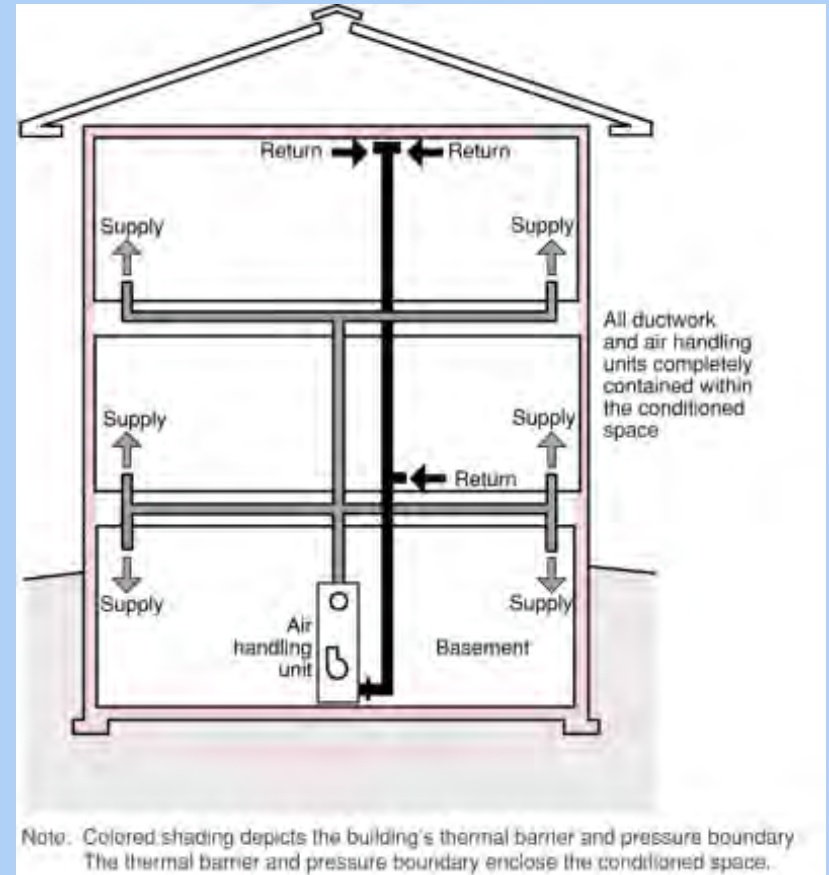
AI2 Heating systems in heated space

Heating equipment including ductwork located outside the heated space is less efficient than capturing the heat loss within the heated space. Does not apply to outdoor condensing units for heat pumps.

Requirement:

Place heating/cooling systems and distribution inside actively heated and finished spaces.

Possible Points: 1





Affordability Improvements

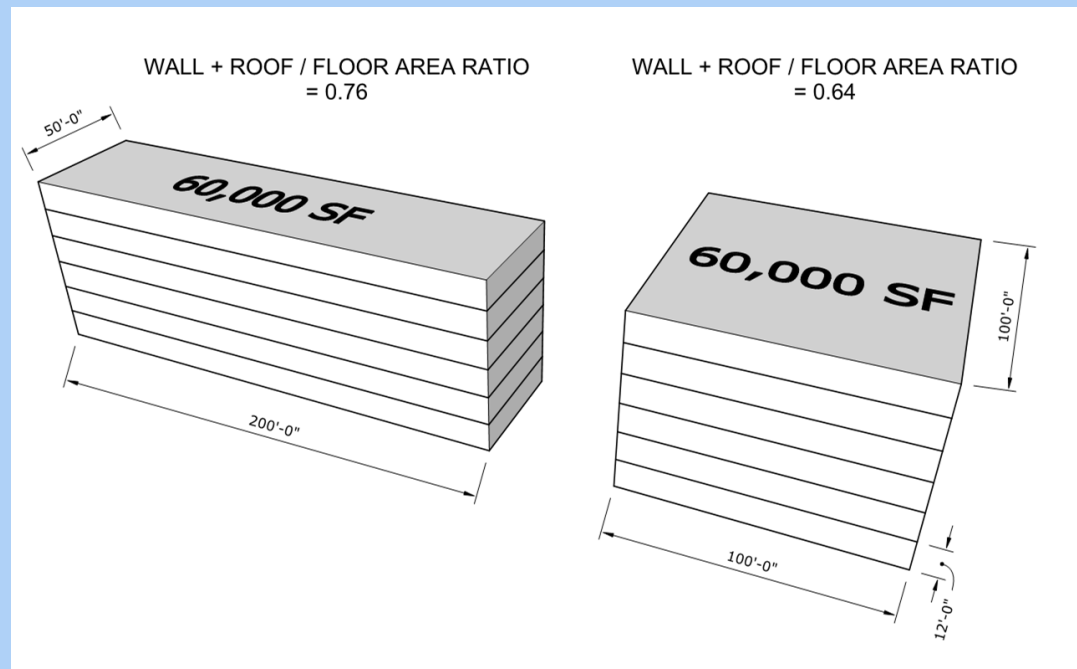
AI3 Efficient building shape

More compact building forms are more energy efficient than sprawling forms because of reduced surface area of the thermal envelope relative to amount of floor area.

Requirement:

Exterior surface area divided by gross floor area is less than maximum value provided in reference table.

Possible Points: 1





Affordability Improvements



AI4 Right-lighting

Overlighting can waste unnecessary energy.

Requirement:

Reduce overlighting (25% lower lighting power density than the energy code) and other lighting improvements. Unnecessarily long-duration lighting operation is avoided through use of motion sensors.

Commercial only.

Possible Points: 1





Affordability Improvements

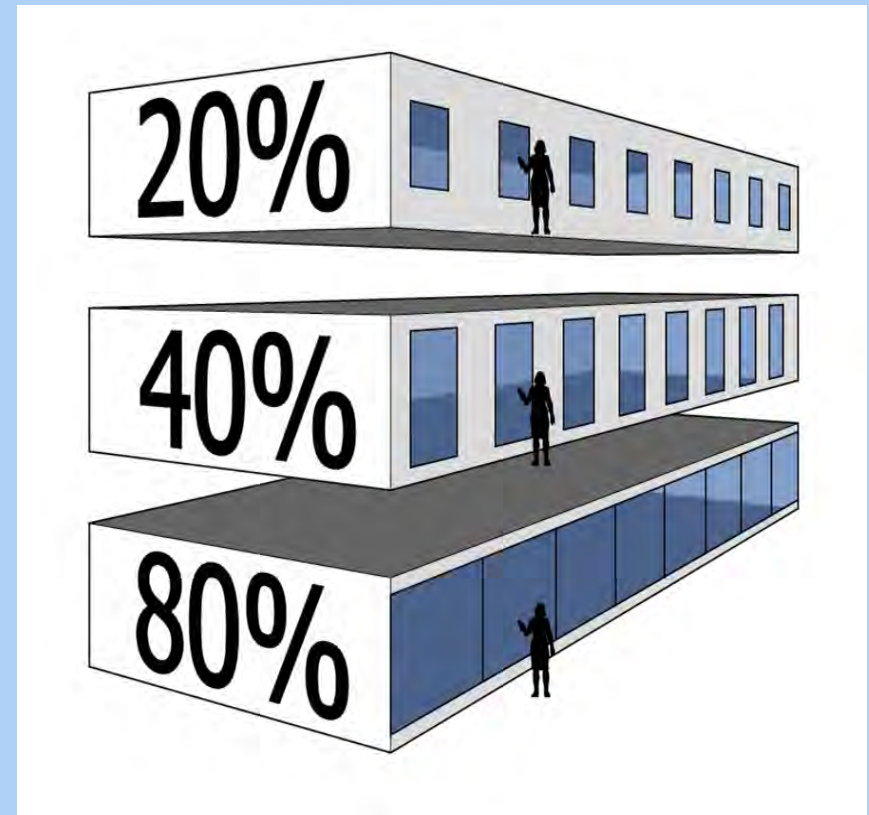
AI5 Modest window to wall ratio

Larger windows than necessary to provide access to views and natural daylight significantly increase energy use for both heating and cooling buildings.

Requirement:

Overall window-to-wall ratio less than 20% (individual spaces may exceed 20%).

Possible Points: 1





Renewable Energy



RE1 Renewable energy systems

Solar hot water and photovoltaic systems either on site or off site can be necessary components of a Net Zero Energy building.

Requirement:

Electric systems: 1 point per 1.2 kwh/sf/year renewable energy capacity (Residential) or per 2.4 kwh/sf/year (Commercial). Thermal systems: 1 point per 4.0 kBtu/sf/year renewable energy capacity (Residential) or per 8.0 kBtu/sf/year (Commercial).



Possible Points: 1-3



Renewable Energy



RE2 Biomass space heating systems

Biomass space heating systems can be carbon-neutral.

Requirement:

3 points (Commercial) or 4 points (Residential) for approved biomass heating systems.

Possible Points: 3 - 4





Other Points

OP1 Development Density

Households and businesses located in closer proximity to each other can be better served by public transit and car sharing programs.

Requirement:

Residential Density > 7 dwelling units/acre

Commercial Density > 7,000 sq ft/acre

Possible Points = 1





Other Points

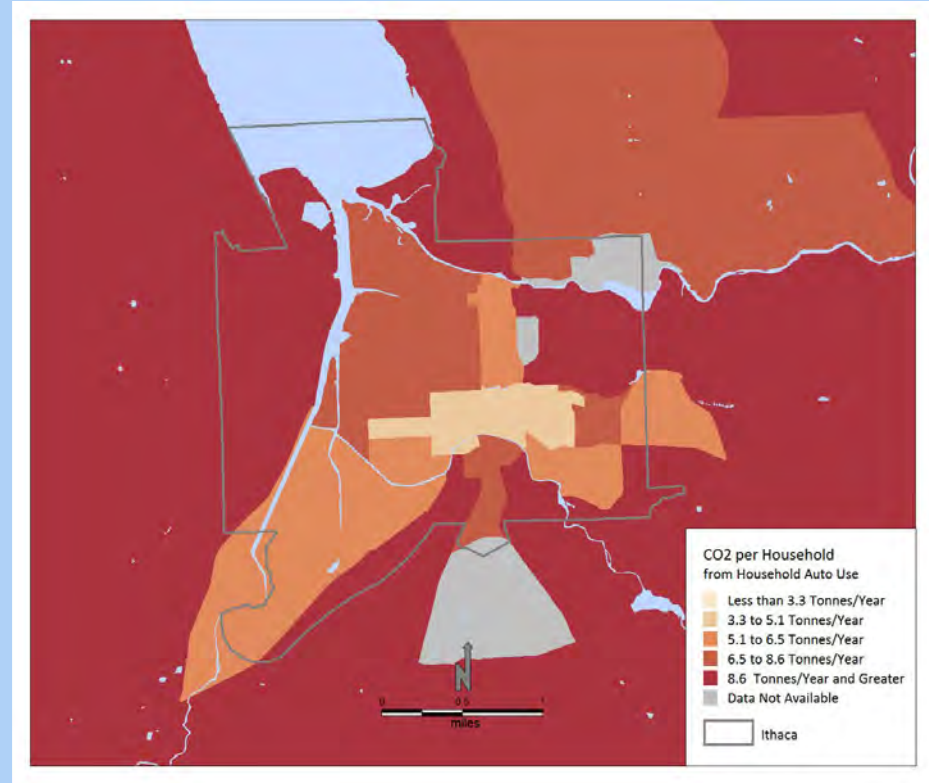
OP2 Walkability

Households located outside the core of the city (not walkable to services) generate on average almost 3 times as much CO₂ due to increased dependency on vehicle trips.

Requirement:

Project located within $\frac{1}{4}$ mile of 5 common services or in a target development area.

Possible Points = 1





Walkable Neighborhoods - Green Building Policy Map





Other Points



OP3 Adaptive reuse

According to the National Trust for Historic Preservation it can take between 10 to 80 years for a new energy efficient building to overcome, through efficient operations, the climate change impacts created by its construction.

Requirement:

Substantial re-purpose of an existing building that maintains at least 50% (based on surface area) of the existing building structure and envelope.

Possible Points = 1





Other Points

OP4 Meet NY Stretch Energy Code

NYSERDA has drafted NYStretch Code-Energy 2015 – a voluntary, locally adoptable stretch energy code. It is the latest stretch energy code for New York buildings and is roughly 10% more efficient than the residential provisions of the International Energy Conservation Code (IECC) – 2015.

Requirement:

Comply with NY Stretch Energy Code

Possible Points = 1



Want Greener Buildings? Stretch Codes Get You There Faster.

Adopting stretch codes can drastically improve building energy efficiency beyond existing codes, and put buildings on the path to zero energy by 2050.



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Other Points

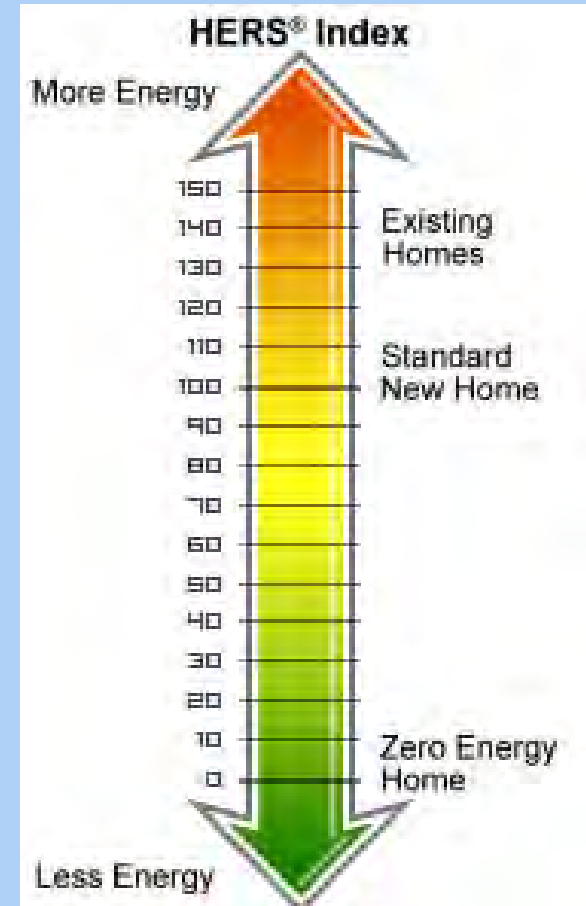
OP5 Energy improvement of choice

Custom solutions may provide savings which can be shown through energy analysis performed by an experienced energy professional. For a baseline, use the NYS Energy Code, latest edition.

Requirement:

One point for each 1.2 kwh/sf/year (Residential) or 2.4 kwh/sf/year (Commercial) reduction in energy use. Prerequisite: no fossil fuels.

Possible Points = 2 Max





Answers to Our Initial Questions



- Would the proposed point system work for known high-performance buildings, in other words, would they have passed? **Yes**
- Would the point system work for known non-high-performance buildings, in other words, would they have failed? **Yes**
- Would such a point system have impacted designs? **Yes. We see some examples where somewhat high-performance buildings would fail, but by pursuing extra points, could pass fairly easily.**
- Do “better” buildings score higher? **Yes**
- Would the point system be unusually cumbersome and costly? **No**
- Is the point system easy to pass? **Possibly, but that isn't a bad thing if desired results are achieved.**



Project Status and Next Steps



- **Final GBP Report approved by City Common Council and Town Board in May 2018**
- **Next Steps**
 - Additional research – Ongoing
 - Additional Stakeholder outreach – Q4 2018
 - Codify policy recommendations – Start Q4 2018
 - Council vote on local law – 2019



Thank You!



Nick Goldsmith
Sustainability Coordinator
Town of Ithaca, NY
City of Ithaca, NY

607-273-1721 ext. 136

ngoldsmith@cityofithaca.org

IthacaGreenBuilding.com

