

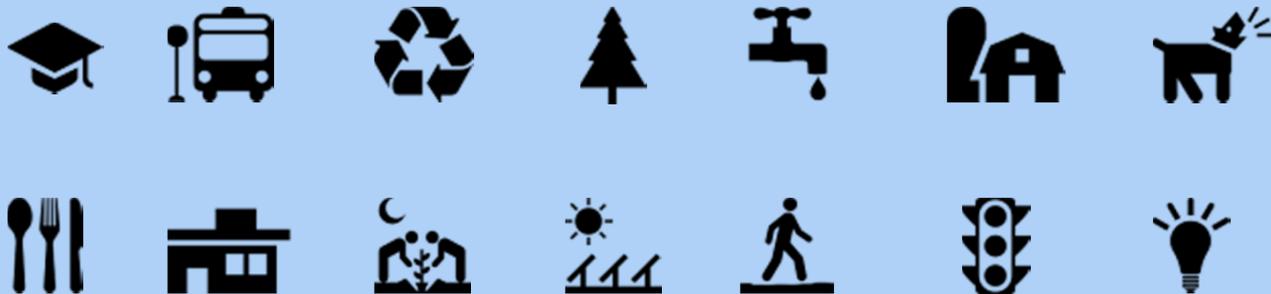


Municipal Sustainability in Ithaca



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

**WELLS COLLEGE – SUSTAINABILITY PERSPECTIVES
SEPTEMBER 10, 2018**





Agenda



- Introduction
- Background
- Ithaca Green Building Policy
- EV Tompkins
- Q&A





Introduction





Introduction



- Interruptions welcome

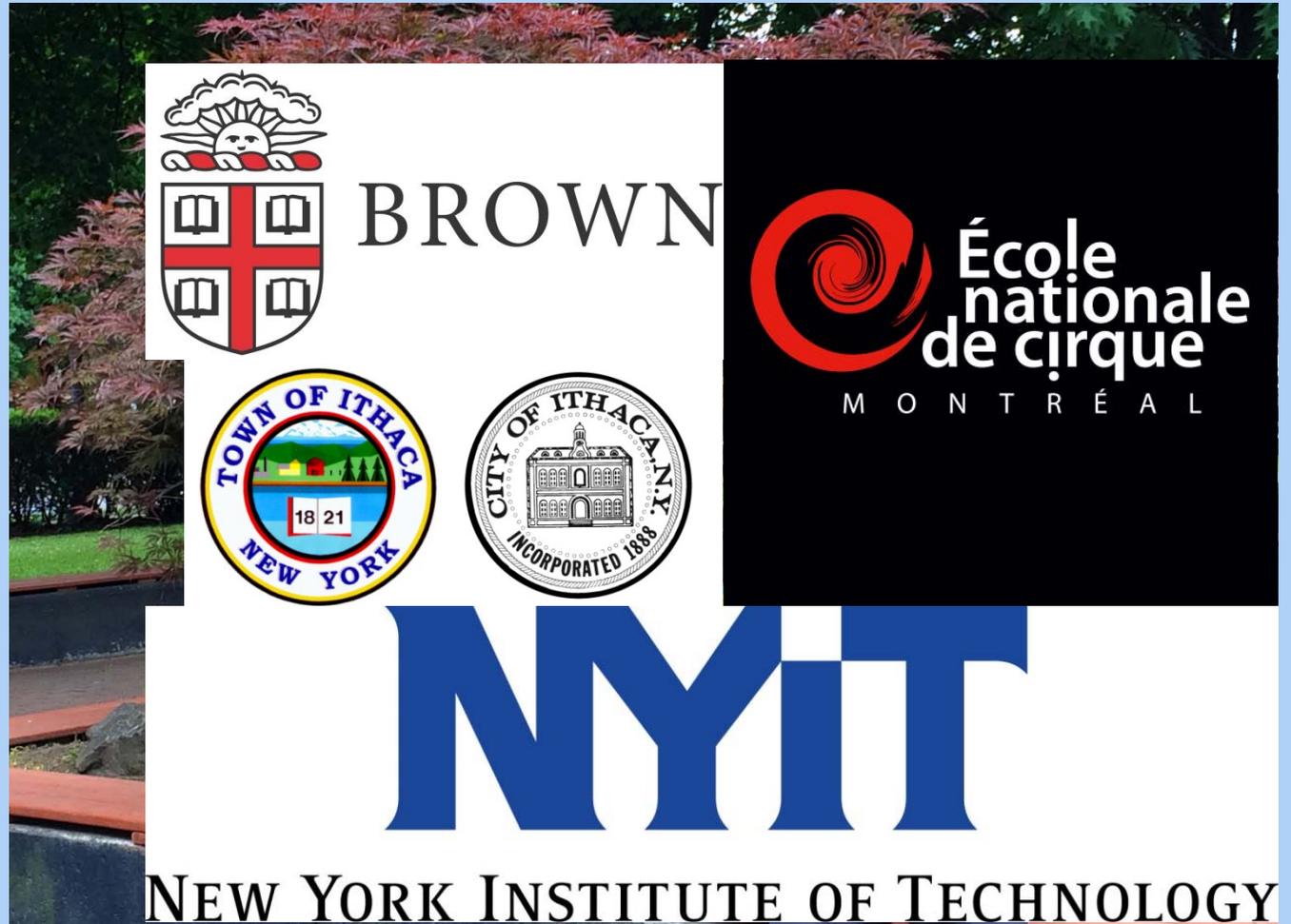




Introduction



Who am I?





Introduction



Who am I?





Introduction



- This series explores the concept of '*sustainability*' from a variety of viewpoints.



Introduction



Who are you?

- Student
- Faculty or Staff
- Other
 - Community member
 - Tourist
 - Yeti

Who are you?

- Environmental Studies or Sustainability
- Business
- Architecture or Planning
- Other

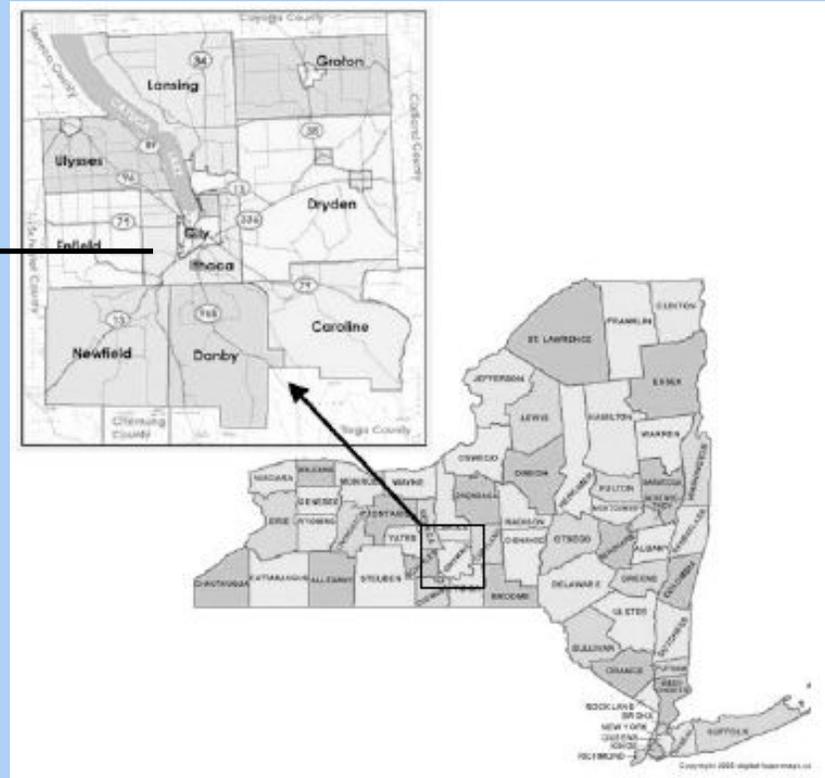
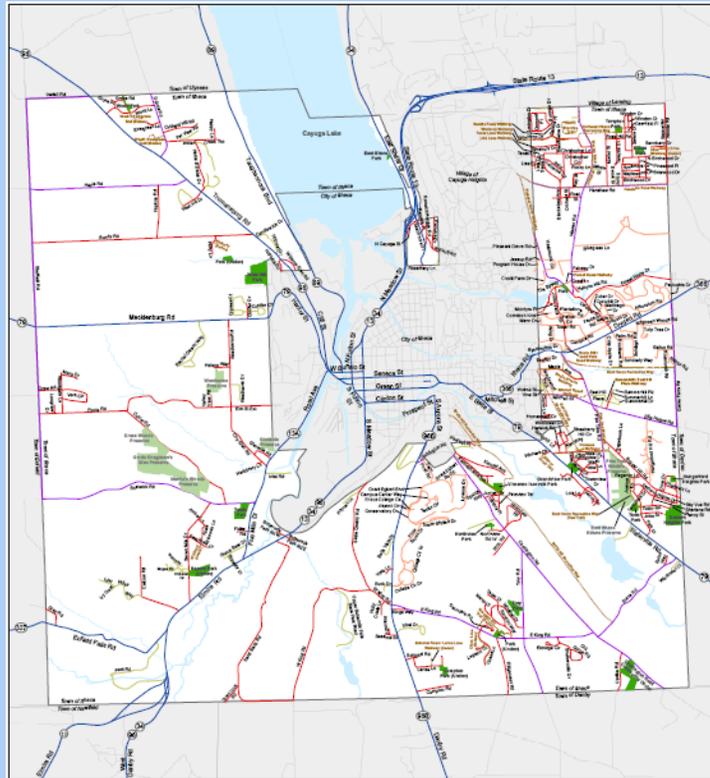


Background





Background

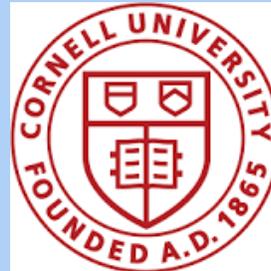




Background



- Ithaca has a strong history of sustainability efforts

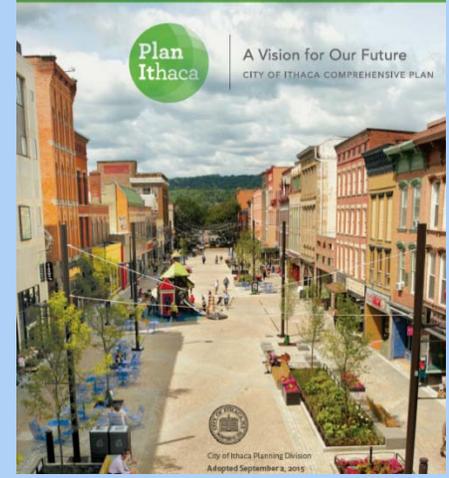




Background



- 2009: City and Town join Climate Smart Communities
- 2010: First Sustainability Coordinator
- 2014/15: Comprehensive Plans endorse sustainability, climate protection, and equity
- GHG reduction goals in line with Paris Agreement
 - 80% reduction in GHG emissions by 2050
 - In line with NYS, Tompkins County

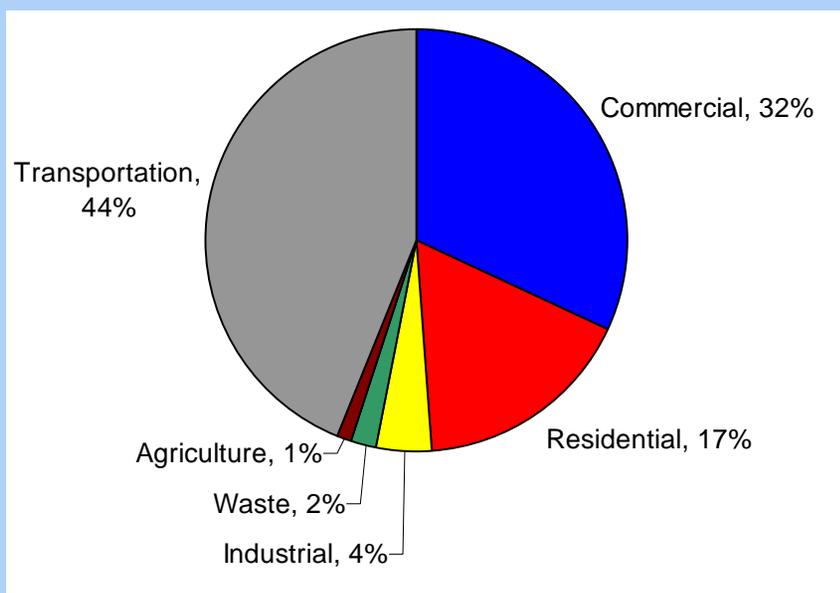




Background - GHG Emissions

- **Town of Ithaca**

- Total Emissions: 178,000 tons CO₂ equivalent



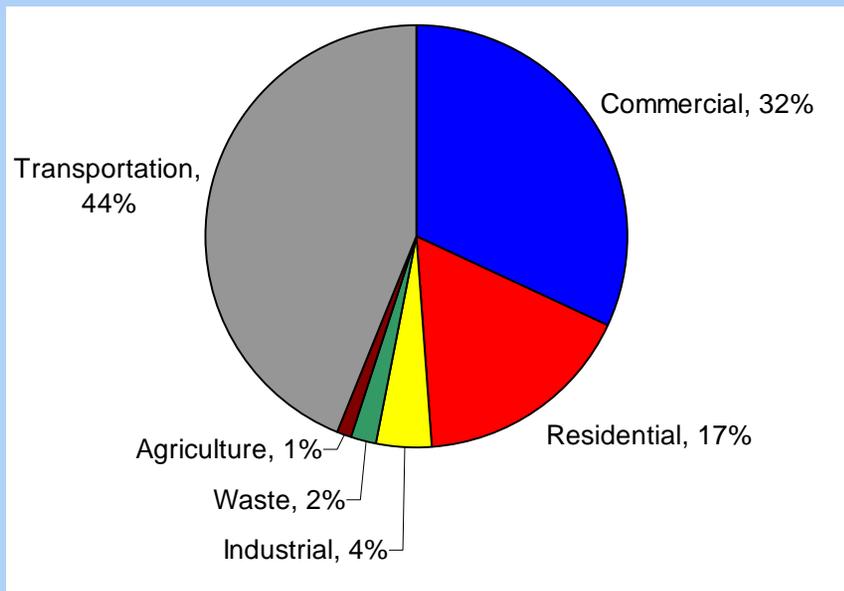


Background - GHG Emissions



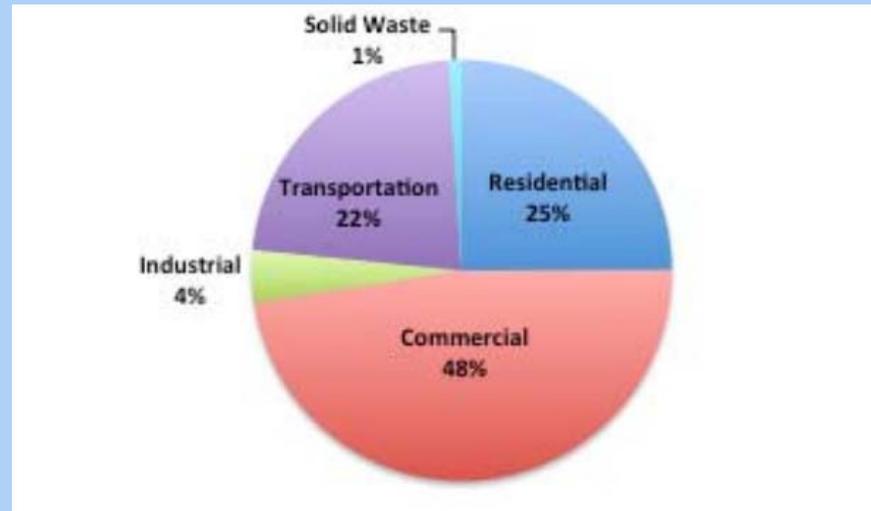
- **Town of Ithaca**

- Total Emissions: 178,000 tons CO₂ equivalent



- **City of Ithaca**

- Total Emissions: 163,000 tons CO₂ equivalent





Background - GHG Emissions



Biggest problems/opportunities:

- Energy use in buildings (50% - 75%)
- Transportation (22% - 44%)

- Energy efficiency in buildings and transportation
- Also consider *Fuel Sources*
 - Electricity sources
 - ✦ Fossil fuel vs. Renewables
 - Transportation fuel
 - ✦ Gasoline & Diesel vs. Electric & Renewables



Green Building Policy Project





Background



- Building sector poses challenges to meeting GHG targets
- To meet 80% by 2050 goal, we need to address building energy use
- The City has started to, and will continue addressing existing buildings
- The Green Building Policy focuses on new construction, the “easy” part



Project Overview



A **grant-funded** project to do an **examination of green building standards** for **new construction and major renovations** and ways that both the **City of Ithaca and the Town of Ithaca** could use to **incentivize and/or mandate** the standards.



Project Team



- **Consultants**
- **Steering Committee**
- **Advisory Committee**



Criteria of a Successful Green Building Policy



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

1. ***F*lexible**
2. ***A*ffordable**
3. ***I*mpactful**
4. ***R*eachable**



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

Other Recommendations



Recommendations



A mandate with two compliance options

1. Whole Building Path

-OR-

2. 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
 - Emphasis on affordability-driven features

Incentives would require more points





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 energy buildings



Incentives

Incentives could be made available for projects that meet the requirements of the next code cycle.

1. Recognition
2. Property Tax abatements (IDA, CIITAP, Green Building Tax Exemption)
3. Additional square footage (height, stories, lot coverage, parking requirements)
4. Relaxed zoning use requirements
5. Streamline planning board approvals
6. Permit fee relief (reduction/rebate/deferral)



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:

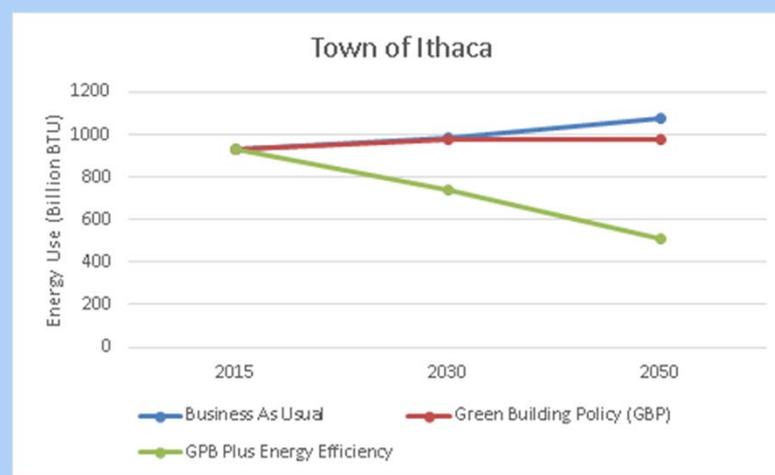
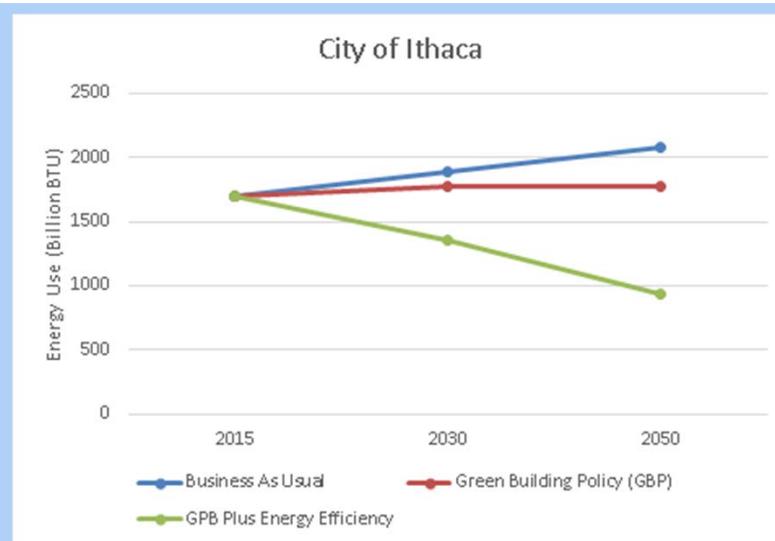
- New additions less than 500 square feet
- Limited renovations

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



Anticipated Results

- **40-50% lower carbon emissions** than NYS Energy Code for new construction
- **Lower or similar construction costs** (using Easy Compliance Path)
- Increased emissions from building sector growth would level off.





Other Recommendations



1. Consider conducting a similar study and policy for **existing buildings**
2. Consider adopting a **benchmarking policy** that requires the tracking of energy use of existing buildings



The Easy Path





Can you get six points?



Efficient Electrification

- Heat pumps or biomass for space heating 3 points (2 points commercial)
- Ground source heat pumps 4 points (3 points commercial)
- Heat pumps or biomass for domestic hot water heating 1 point (residential/hotel only)
- Electric stove and heat pump dryer and no fossil fuels in building 1 point

Affordability Improvements

- Smaller building size: 15% or 30% smaller than reference 1 - 2 points (residential/hotel only)
- Window to wall ratio: 20% 1 point
- Compact building shape 1 point
- HVAC system and distribution in heated space 1 point
- Reduce overlighting (25% lower power density than code) 1 point (commercial only)

Renewable Energy

- Renewable energy system(s) 1 - 3 points
- Biomass system 3-4 points

Other Points

- Density > 7 dwelling units/acre 1 point
- Location w/in 1/4 mile of 5 common destination types (bank, etc.) 1 point
- Meet NY Stretch Energy Code 1 point
- Reduce energy by 10% or 20% by method of your choice 1 - 2 points
- Adaptive reuse 1 point



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

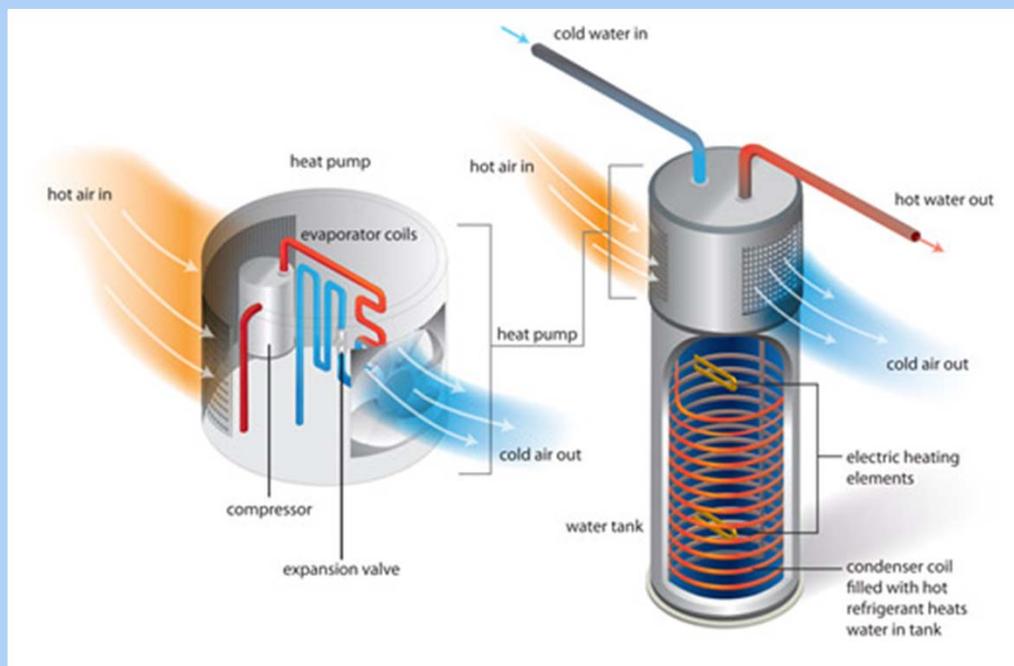
EE2 Heat pumps for water heating

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

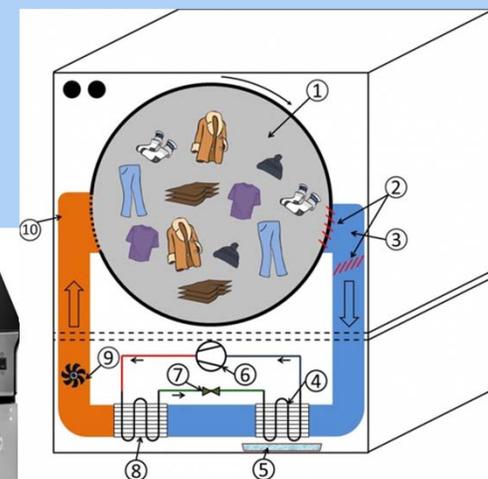
EE3 Electric stove and ventless heat pump clothes dryer

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 (Residential). Requires EE1 as prerequisite, and no fossil fuels in the building.

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 (ft²) per No. of Bedrooms

1	2	3	4	5	6	7	8 or more
1,000	1,600	2,200	2,800	3,400	4,000	4,600	+ 600 ft ² per additional bedroom
0				0	0		

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



Affordability Improvements



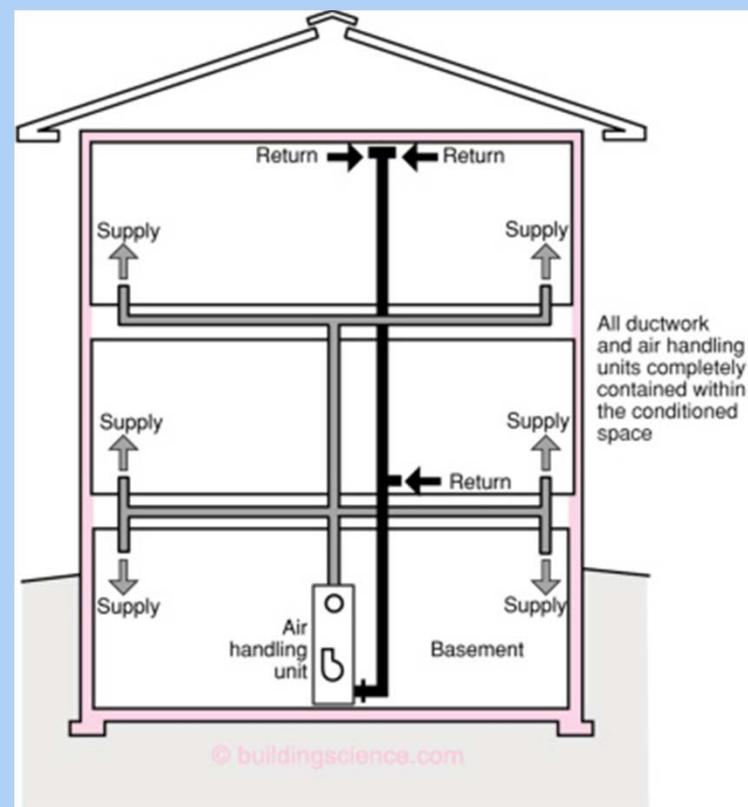
AI2 Heating systems in heated space

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



Note: Colored shading depicts the building's thermal barrier and pressure boundary. The thermal barrier and pressure boundary enclose the conditioned space.



Affordability Improvements

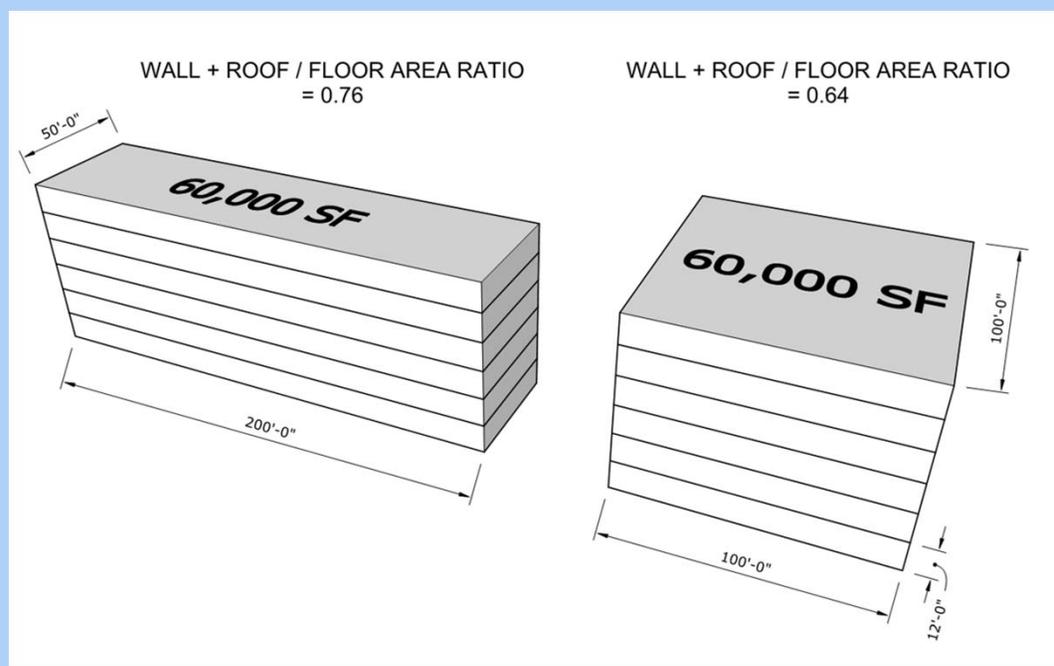
AI3 Simple/Compact building shape

More compact building forms are more energy efficient than sprawling forms because of increased 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

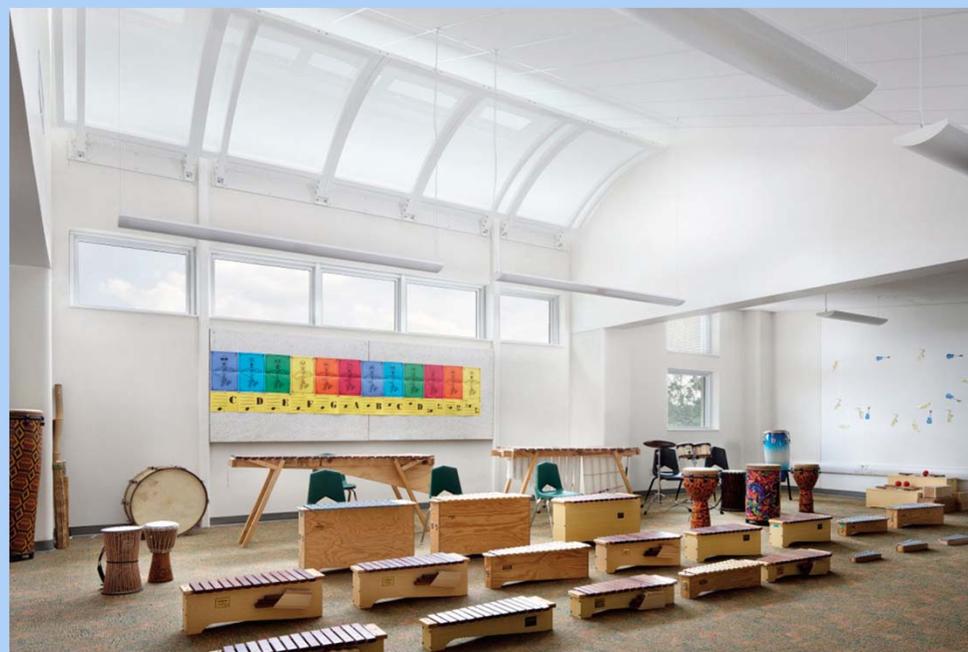
Overlighting can waste unnecessary energy.

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



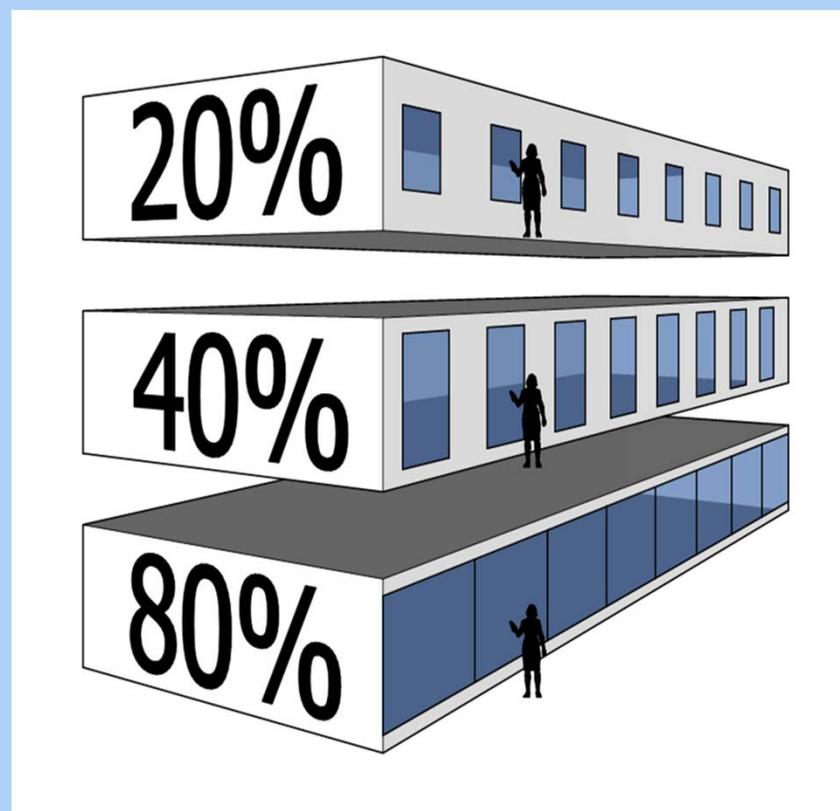
AI5 Modest window-to-wall ratio

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 located in close proximity to each other can be served by public transit and greater opportunities for car sharing.

Requirement:

Density > 7 dwelling units/acre

Possible Points = 1





Other Points



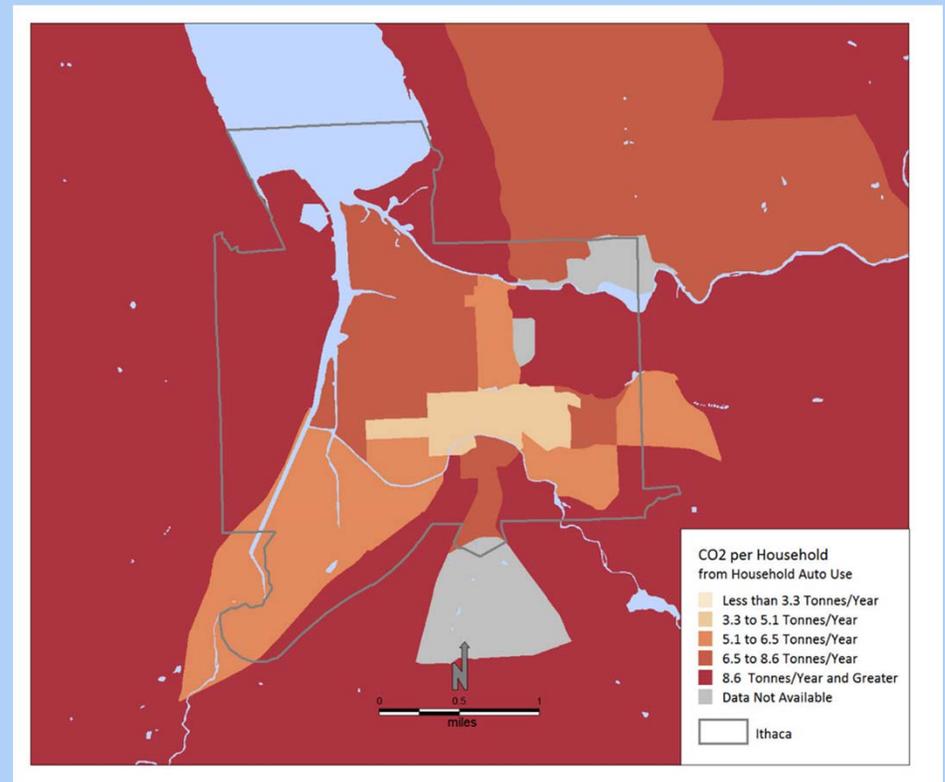
OP2 Walkability

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 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

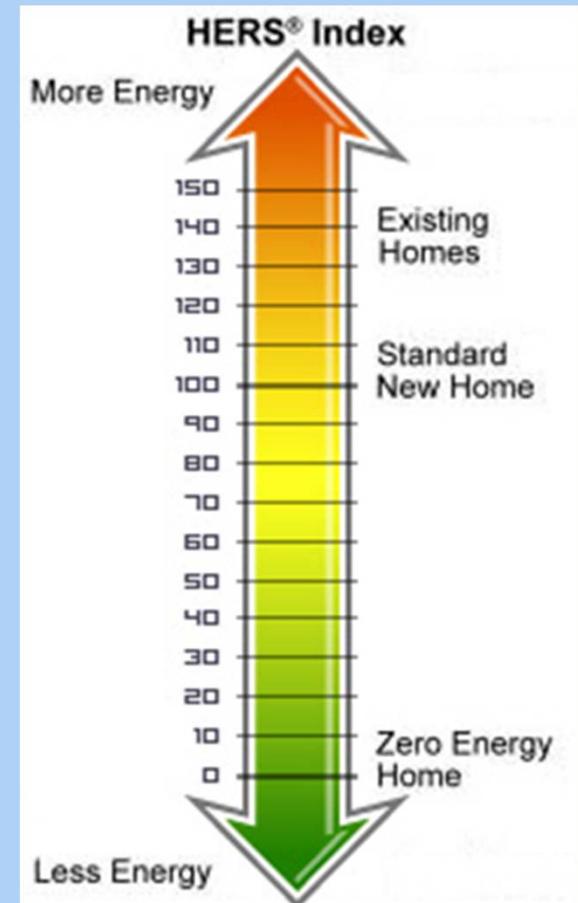
OP5 Custom Energy Improvement

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 – Fall 2018
 - Codify policy recommendations – Start Fall 2018
 - Council vote on local law – 2019 (?)



Learn More
www.ithacagreenbuilding.com





EV Tompkins





Electric Vehicle Infrastructure Plan



- A consortium of organizations, including the City and the Town
- Developing a plan for electric vehicle charging stations and other infrastructure to support EV adoption
- 12 month project
- NYSERDA-funded



EV charging station outside Taitem Engineering

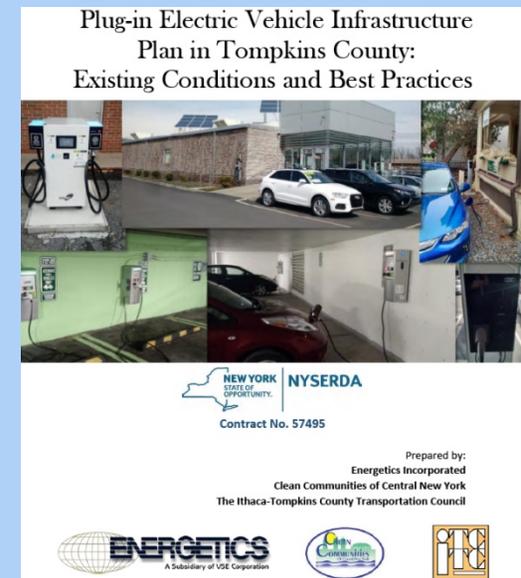


Electric Vehicle Infrastructure Plan



- **Main components of project**

- Existing conditions and best practices report
- EV charging station criteria tool
 - ✦ Assist in identifying suitable locations for the installation of charging stations
 - ✦ Location, access, costs, different technologies
- EV Charging Station Suitability Report
 - ✦ Identifies optimal locations for charging stations in County





Electric Vehicle Infrastructure Plan



- **Main components of project (continued)**
 - Preliminary engineering and cost analysis for 5 optimal sites
 - EV Infrastructure Plan that includes:
 - ✦ Implementation strategies and specific actions for implementation of an EV charging station network in Tompkins County;
 - ✦ Implementation phasing schedule; and
 - ✦ Financing strategies and opportunities



EV Tompkins



EV TOMPKINS

DRIVE ELECTRIC



EV Tompkins

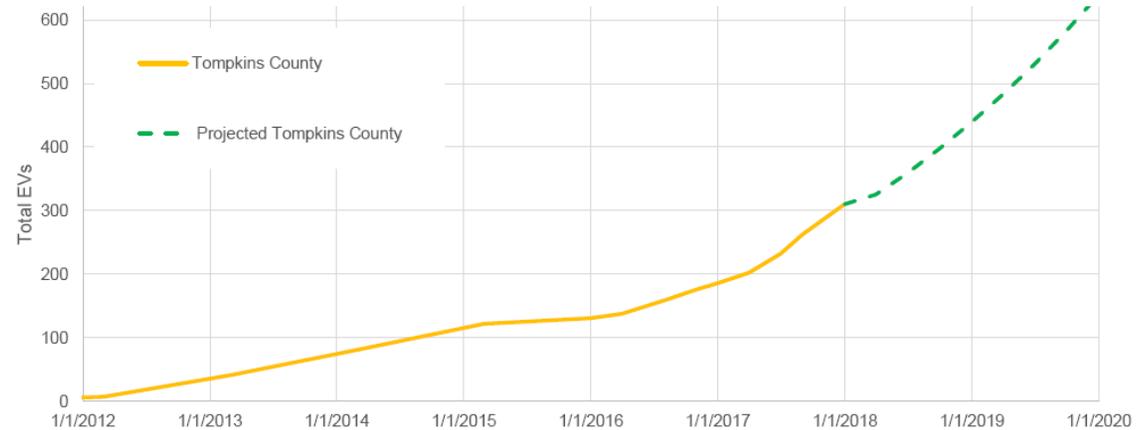


EV Tompkins GOALS

EV Tompkins is working with public and private sector leaders to provide the necessary infrastructure, educational outreach, coordination, and commitment from local businesses

Double the number of EVs registered in Tompkins County from 310 to 620 before December 2019

Tompkins County EV Registrations





EV Tompkins



EVTompkins TARGETS

Working towards the program goal to double the number of registered EVs

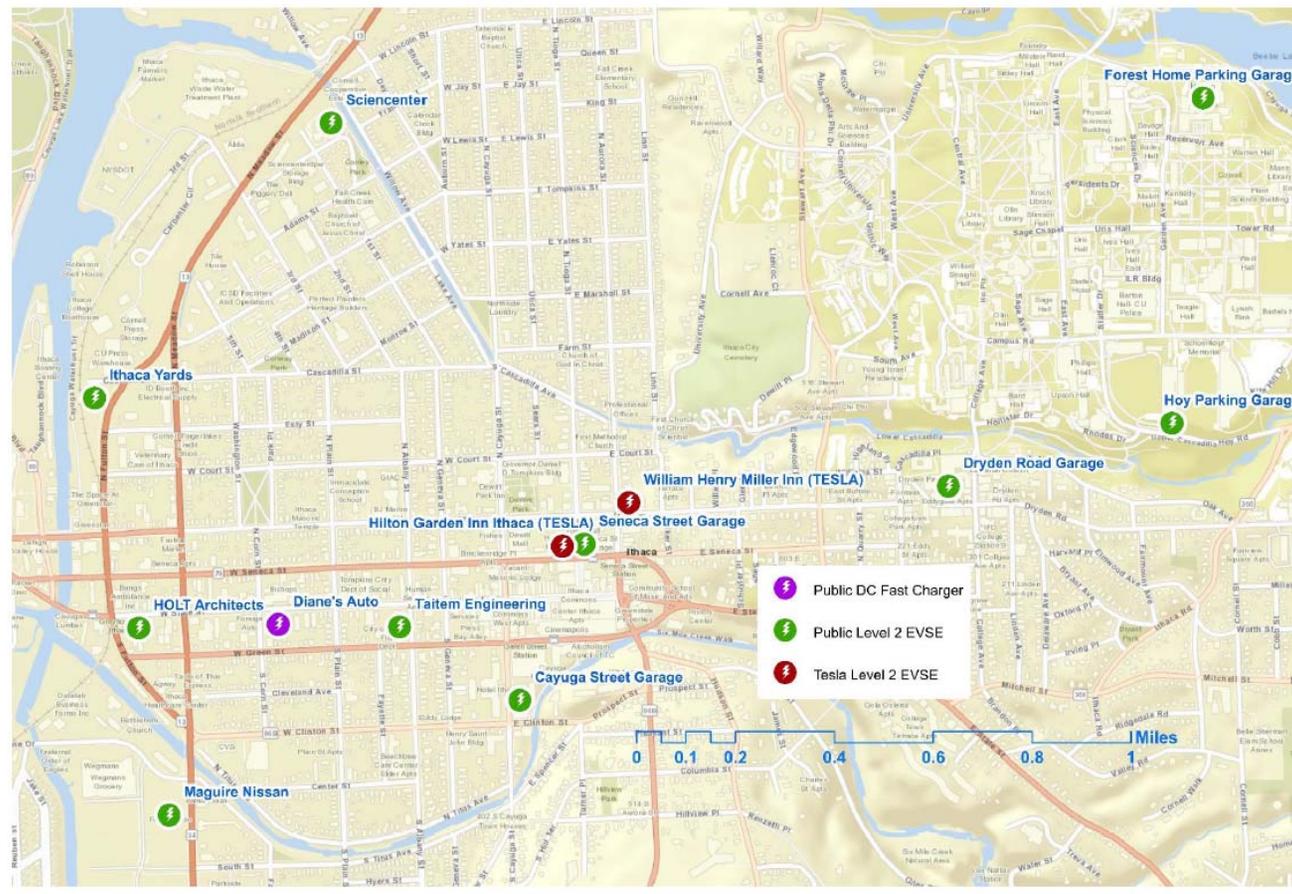
- **Provide EV charging** at more than 40 locations
 - Currently at 27 with the 11 new public charging stations already supported by **EV**Tompkins
- **Double EV inventory** at dealerships and **educate industry partners**
 - In February there were 5 different EV models available with a stock of 47 new and 6 used EVs in Tompkins County
- Support and implement 10 new **EV-ready community strategies**
- Increase **public awareness** and EV knowledge
 - Facilitating 250 EV ride or drives and sharing EV information with over 2,500 residents
- Double the number of **EVs in local fleets**
 - Currently 10 EVs are operated by Tompkins County



EV Tompkins



CITY OF ITHACA CHARGING STATIONS





Learn More about Ithaca Sustainability



- **E-newsletter**
 - Sustainability news and events
 - Subscribe at <http://tinyurl.com/IS-subscribe>

- **Facebook page**
 - Like us at www.facebook.com/IthacaSustainability

- **Intern announcement email list**
 - Subscribe by emailing ngoldsmith@town.ithaca.ny.us



WELCOME TO THE OCTOBER 2016 ITHACA SUSTAINABILITY NEWSLETTER.
We hope you enjoy this month's assortment of news and events.

NEWS

New State Energy Code is Here

On October 3rd the 2016 Energy Conservation Construction Code of New York State (ECCCNYS) went into effect for residential and commercial buildings. The 2016 ECCCNYS is based on the [2015 IECC](#) and the 2016 New York State Supplement. For more information on the energy code change [click here](#).

GYGB Offers Personalized Energy Advising

Questions about going solar? Want help figuring out what incentives you qualify for to make your home more energy

EVENTS

ARTIVISMO: ARTE DE JUSTICIA
Social Justice Art

FIRST FRIDAY GALLERY NIGHT
OCTOBER 7TH 2016 5-8PM

"Artivismo: Arte de Justicia" is an exhibition that visually demonstrates the social justice art of our time. The art featured in the exhibit



Any questions?



Q

&

A



Thank You!



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