

TC CPI | Tompkins County Climate Protection Initiative

2020 TCCPI MEMBER ACCOMPLISHMENTS

Alternatives Federal Credit Union

- In 2020 we made just seven solar and energy efficiency loans for a total of \$130,224. Solar loans decreased 56% as compared to the previous year. The good news is that 2021 has seen a recovery -- through May we have already done 12 loans for \$168,145. That is better than the 2019 pace. Our 2020 numbers were low because most of our loan staff pivoted to assist in processing pandemic related loans, grants, and services.
- Our rooftop solar panels continued to provide a substantial part of our electricity during the year.
- Our partnership with Renovus Solar continued, furthering our work together for the good of the environment and local economy by expanding renewable energy usage
- As one of the founding members of the Ithaca 2030 District, we participated in the District Partner quarterly meetings.
- The staff "Green Team" continued working to improve energy efficiency and reduce waste.

Center for Community Transportation

The Center for Community Transportation envisions a community where travel by shared and active transportation is healthy, safe, affordable, and convenient for all. The CCT's mission-focused services and activities include Ithaca Carshare, Bike Walk Tompkins (and its signature program Streets Alive! Ithaca), and Backup Ride Home, emphasizing social equity and environmental sustainability in this era of new transportation options and emerging mobility trends. CCT works with local transportation providers, educators, planners, decision-makers, advocates, and users to fulfill the mission of enhancing transportation access in our community while reducing its negative environmental and economic impacts.

- Launched a transportation guest speaker series with a well-attended public talk by Tim Papandreou (Director of Strategic Planning & Policy, San Francisco Municipal Transportation Agency) on "Preparing for our Transportation Future."
- Began work in collaboration with the City of Ithaca and the Downtown Ithaca Alliance on the Go Ithaca commuter incentives program, and development of a Transportation Management Association, including key work with waterfront developers to put more environmentally and economically smart transportation systems in place.

Ithaca Carshare

- As a result of the shifted driving habits of members and higher than average fuel economy of the fleet, an estimated 11,272 gallons of gasoline and 103 metric tons of carbon dioxide were avoided.
- 596 new Ithaca Carshare members reported that they would sell or avoid the purchase of 113 vehicles.
- The Easy Access membership plan, now self-funded, continues to serve local individuals.
- 1,343 members took a combined 15,648 trips totaling 198,451 miles.
- Fleetwide fuel economy was 32 mpg, 20% above the 2019 national average of 25.5 mpg.



Bike Walk Tompkins

- Developed a Bike Education network, connecting schools to resources needed to design, fund, and implement bike education programming in 2nd grade curriculum.



- Acted as a community liaison with Lime on the Lime Access program, which offers subsidized access to the app-based bikeshare service for people with low income, no smart phone, or no debit card.
- Hired 6 bike champions to be community ambassadors for biking. The bike champions hosted over a dozen new bike events in typically underserved communities, including learn to ride programs for seniors.
- Offered the first-ever complete schedule of learn-to-ride classes to the community, which enabled many adults, particularly women, to ride bicycles for the first time since their childhood.
- Organized the 14th and 15th editions of Streets Alive!, with each event closing 10-15 city blocks to cars and opening them up to people to bike, walk, roll, dance, play, etc. for 4 hours. Each event uses 50-80 volunteers and draws an estimated 2,500 participants.
- Hosted the 5th Streets Alive! Film Festival at Cinemapolis in March and launched a monthly bike film series with Cinemapolis in October.
- Convened meetings with community leaders about biking and continued the development of the Bicycling for Everyone Action Plan, slated for release in summer 2020.

Backup Ride Home

The Backup Ride Home program provides peace of mind for commuters who travel to work without a personal vehicle (bus, carpool, bike, etc.). Ithaca Carshare's on-call staff facilitates free alternate transportation home if something unexpectedly happens that makes an original commute plan home unfeasible. Enrollment in the program grew to 85, and 3 rides home were provided. CCT collaborated with the Downtown Ithaca Alliance's Go Ithaca commuter program to integrate Backup Ride Home enrollment for all participants.

City of Ithaca

Green New Deal Implementation

- Initiated a second search for Director of Sustainability (first search suspended due to COVID).
- Met regularly with the GND Interim Advisory Group of community stakeholders.
- Performed outreach to educate and build support for GND, and crafted initial GND communications including webpage, GND summary document, and equity definitions.



Ithaca Energy Code Supplement

- Worked with the City Attorney, Town of Ithaca, and GBP Working Group to codify the Ithaca Energy Code Supplement which will mandate reduced GHG emissions in new construction.

Emissions Reductions for Existing Buildings

- Worked with the Town of Bedford, City of Saratoga Springs, Sabin Center for Climate Change Law, and Hodgson Russ Attorneys to develop state-enabling legislation and model local laws for future city legislation.
- Worked with Cornell professors and classes to conduct early research.

Other

- Adopted a new law enabling Property Assessed Clean Energy (PACE), a financing option for energy efficiency and renewable energy projects in commercial and non-profit buildings.
- Worked with the Downtown Ithaca Alliance on incentive programs for downtown workers to use alternate transportation modes rather than their personal automobile.
- Continued the City-wide LED streetlight upgrade.

Climate Reality Project, Finger Lakes Greater Region NY (FLGR-NY) Chapter

The Finger Lakes Chapter of Climate Reality includes inspired climate activists located in the Finger Lakes and Southern Tier regions of Central NY.

We are working to unify climate activism over a fairly widespread area, with plans to improve public awareness of the climate emergency and to actively promote the completion of the goals of the Climate Leadership and Community Protection Act (CLCPA) for our region. The Chapter also aims to reach out and work cooperatively with other active environmental, climate justice, and sustainability groups within the region.



2020 Accomplishments

- The Chapter formally started on August 19, 2020 with five charter members. By the end of 2020, the Chapter had grown to 36 members, 19 of whom were trained Climate Reality Leaders.
- Regular monthly chapter meetings have been occurring since September 2020 and formal chapter elections were completed for 2021 officers. An initial draft of Chapter Mission, Vision, and Long-term Goals was completed.
- Chapter members made two presentations for the Climate Reality's 24 Hours of Reality worldwide event (October 10-11, 2020).
- As part of the New York State Coalition of Climate Reality Chapters, we have been taking an active role in the Weekly Calls to Action where Federal and State legislators are contacted to support various pieces of legislation. We have also been involved in the planning of the NYS Coalition Spring Retreat scheduled for April 9-10, 2021.
- The Finger Lakes Chapter started participating in TCCPI in December 2020. We have also joined the Climate Solutions Accelerator (formerly Rochester Peoples' Climate Coalition) and NY Renews umbrella organizations.

Cornell Cooperative Extension – Tompkins County



Clean Energy Communities

Summary: CCE-Tompkins holds the contract for the Southern Tier for this program, which works with municipal officials to save energy in their facilities and communities through targeted, prescribed actions.

Impact: 2020 capped off a four-year "Leadership Round" that resulted in more than \$1.78 million in grants awarded throughout the Southern Tier. There were 81 active communities and 37 designated communities during that time, with a total of 220 completed actions that included the installation of almost 11,000 LED streetlights, installation of 19

electric vehicle charging stations and purchase of 6 EVs, and 63 communities sending staff for code enforcement trainings. Staff also helped the following Tompkins County communities become Climate Smart Communities certified (as well as others in the Southern Tier): Ulysses (Bronze), Tompkins County (Silver), City of Ithaca (Bronze), Town of Ithaca (Bronze), Town of Dryden (Bronze), and the Town of Caroline (Bronze). See [here](#) for a sample CEC newsletter. In late 2020 we were awarded the subcontract to cover the Southern Tier for the next program cycle.

Ithaca 2030 District

Summary: Ithaca became an official 2030 District in mid-2016, with the CCE-Tompkins office building being one of the District's founding member buildings.

Impact: CCETC Energy & Climate Change Team Leader Guillermo Metz serves on the Advisory Board and has helped develop resources for District Member building owners.

Energy Smart Community (ESC)

Summary: The ESC is a collaborative project focused on modernizing our electricity system through smarter infrastructure, reduced peak demand, and increased customer engagement. CCE-Tompkins and Cornell University have partnered with New York State Electric and Gas (NYSEG), the local utility, to develop and test the technologies, educational approaches, and customer options that lead to greater adoption of cleaner and distributed energy sources; improved grid reliability, resilience, and safety; and reduction of overall energy use and shifted use from times of peak demand achieved when businesses and residents have expanded choices and increased energy literacy.



Impact: The ESC effort continues, though in a diminished capacity. While early efforts focused on helping community members understand NYSEG-developed resources such as Energy Manager, to better understand and manage their energy use, in 2020 CCE-Tompkins shifted to working to coordinate planning efforts between NYSEG and Tompkins County municipalities. More coordinated planning can greatly reduce inefficiencies, improve grid resilience, and focus limited resources to where they are most needed in order to facilitate the transition to greater building and transportation electrification.

EV LMI Project

Summary: Growing out of EV Tompkins, a collaboration with Energetics, and other community groups to promote the use of electric vehicles and installation of EV chargers across the county, this project is intended to bring the benefits of EVs to a wider population. This effort includes growing the used EV market, working with local lenders to provide more accessible financing options, and providing outreach and education focused on low- and moderate-income community members.

Impact: After much planning, the majority of this project will take place over 2021-2023.

Induction Cooktop Program

Summary: In late 2020, we started a program to bring the benefits of electrified cooking to a broader audience, focusing on people who participate in the Food as Medicine Tompkins program. Food as Medicine Tompkins provides "prescriptions" for healthy local foods to people who are suffering from food-related illnesses (e.g., diabetes) and/or are on restricted diets due to other health issues (e.g., fighting cancer). In addition to the climate impacts, there are many dangers of cooking with gas and other fossil fuels, including creating indoor air pollutants. We will introduce people to induction cooking through portable induction cooktops. These affordable (between \$40 and \$100) units are a perfect solution for introducing people to the technology without a major investment.

Impact: While most of this work will take place in 2021, we began collaborating with the CCE-Tompkins Nutrition Team on delivering classes that will use portable induction cooktops. Depending on our ability to conduct in-person programming, we will also work with community members who have changed out their fossil fuel-fired heating systems for heat pumps to now consider changing out their fossil fuel-fired cooking appliances as well.

Radon Awareness

Summary: In addition to energy programming, the Energy Team continued to provide information to residents about the dangers of radon and, through a long-standing NYS Department of Health grant, hand out free radon test kits.

Impact: The Energy Team distributed 35 free radon test kits and received nearly 485 page views on the CCETC radon web site. We were obviously hampered by not being able to do in-person programming, but did deliver one radon awareness presentation through Zoom, in addition to the annual in-person radon awareness event that we held before the pandemic shut-down.

Energy Warriors in Green Workforce Training in Tompkins County

Summary: In late 2020, Energy Warriors began a collaborative project with the Finger Lakes ReUse Center, as well as many other community-based organizations, to pilot a Green Workforce training program. This program sought to train unemployed, under-employed, and hard-to-employ individuals in an Environmental Literacy apprenticeship with training based on the nationally recognized curriculum “The Roots of Success,” with an ultimate goal of creating 125 jobs in the green energy sector. That pilot program is now being scaled to reach more individuals in a “Career Pathways Project,” which goes further to prepare individuals to acquire the knowledge and skills to enter into the jobs that will be needed to help the City of Ithaca and Tompkins County realize their Green New Deal plans. This project has received tremendous support from the Tompkins County Legislature, the Director of Sustainability for the City of Ithaca, the DC4 Unions, local employers, and the Tompkins Workforce Development Center.



Impact: In fall 2020, we enrolled seven participants in the training and five of them were able to participate in a paid apprenticeship with ReUse and one got a job with CSP management. This program is expanding in 2021.

TConnect – Increasing Rural Transit Access

Summary: Way2Go partnered with TCAT and the private app development firm Hypercommute to launch the TConnect pilot in the Lansing/Etna area. This door-to-destination service replaces TCAT's weekend fixed-route 77 and allows residents to book a same-day ride from their home in the service area to select destinations, including TCAT bus stops, the Ithaca Mall, and Kendall. Users are able to book rides with as little as a half hour notice by calling in or using the Tconnect app. The purpose is to encourage transit ridership by reducing the barrier of accessing a fixed route bus stop. One of the goals is to reduce single occupancy vehicle use and encourage shared mobility use. Way2Go engaged in Community outreach in the Lansing/Etna area, provided feedback on app design and functionality, and evaluated rider experience through surveys and focus groups. The project will expand to the Dryden area in late summer 2021.

Impact: TConnect provided over 300 rides between its launch in September and December 2020 and provides an average of 30-40 rides each weekend. Learn more at www.tcatbus.com/tconnect.

Shared Transportation Awareness and Education

Summary: Way2Go regularly shares transportation information that promotes new and existing shared mobility options (such as ride sharing, car sharing, car hailing, bike sharing, and demand-response bus service), while supporting public transit as the core of a robust transportation system. To that end, we seek to increase public awareness of services such TCAT, Gadabout, Ithaca Carshare, Bike Walk Tompkins, and Go Ithaca, which is a Downtown Ithaca Alliance (DIA) program that provides “sustainable and affordable transportation solutions to improve a person’s commute and completing errands while supporting a healthy lifestyle, reducing vehicle pollution, and decreasing traffic congestion in our community.” We provide resources that include best practices for ridesharing, how to ride the bus, how to put your bike on the bus, and how to ride the bus while in a wheelchair as well as a comprehensive brochure Transportation Options for Tompkins County and the region. We share this information through the Way2Go website, how-to videos on YouTube, a web-based transportation directory, and through classes such as GIAC’s Hospitality Training Program and TST Boces’ ESL classes.

Impact: In 2020, 10,304 people were reached through social media posts and 22,324 community members were reached through local listservs, local media ads, TCAT Alerts, and webinars.

Way2Go Collaborations with Tompkins County Programs

- Supported biking advocates by sharing educational materials on how to load a bike onto a TCAT bus, collaborating with Bike Walk Tompkins on bike-themed webinars for the public, and providing input on discussions to revive a bikeshare program in Tompkins County.
- Partnered with Go Ithaca to bring the Sustainable Transportation Leaders program to Ithaca High School and Lehman Alternative Community School students. The students formed a club, brainstormed projects to implement in 2021, and learned about a variety of transportation options as alternatives to driving.
- Shared resources and experience on best practices by participating as a member of the DIA advisory committee and Transportation Demand Management working group, focused on the Go Ithaca project.

Other Programs

- CCETC Energy & Climate Change staff worked with City of Ithaca staff to deliver a series of presentations aimed at educating City staff about climate change and engaging them in the Ithaca Green New Deal.
- CCETC Energy & Climate Change staff worked with Building Bridges and other community groups on a series of town hall meetings about the Ithaca Green New Deal to engage community members whose voices are not usually captured in these conversations.
- CCETC Energy & Climate Change Team Leader brought together a group of CCE educators and Cornell faculty and staff to build capacity within the system to better address issues around utility-scale solar, especially as it relates to agricultural land. This led to a two-day summit in 2021 and continued work with various key stakeholders across the state.
- CCETC Energy & Climate Change Team gave several presentations to various community groups on topics including solar options, heat pumps, and radon.
- Building understanding about energy systems: helping community members understand how building energy systems work and how they can participate in improving them.
- Tompkins County Climate and Sustainable Energy Advisory Board: CCETC serves on the steering committee and the policy committee.
- CCETC Energy and Climate Change Team continued to add to and update its website pages and printed resources.
- CCE-Tompkins is developing a website and set of program materials related to best practices for reducing energy usage in agriculture. These materials will be shared with over 10,000 NY farmers in 2021 and 2022.

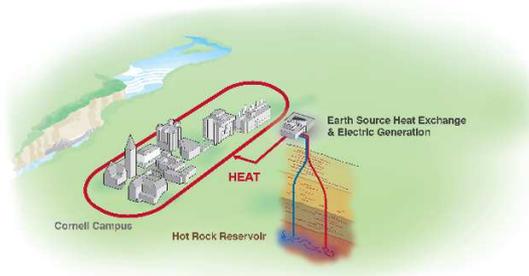
Cornell University

- The Association for the Advancement of Sustainability in Higher Education awarded Cornell a [Platinum sustainability rating](#). Cornell is one of only six institutions (and the only Ivy League) to earn this rating.
- May 2020: [Low Carbon Travel Policy update 3.2](#). Cornell's recent Travel Expense Policy update has included a clause about Low-Carbon Travel. With Cornell's goal of net-zero carbon emissions by 2035, commuters must take emissions into account when travelling for school or work. Attending meetings remotely is recommended for those who would rely on air travel to attend. If meetings must be attended in person, carpooling or taking public transportation is another option highlighted in this report.
- A [sustainability and climate literacy module](#) has been added to first year orientation, providing all incoming Cornellians with basic literacy in sustainability. This module will also provide baseline



data of the student body's sustainability knowledge, allowing comparison between incoming students and graduating seniors.

- Out of 312 schools participating in Sierra Club's "[Coolest Schools](#)" Cornell is ranked #12. Cornell is also the first Ivy league to break the top 20 of this list.
- Cornell was listed on the Princeton Review's [Green Honor Roll](#) for 2020, one of only 30 schools to earn this title. Green Honor roll schools must score a 99 (the highest possible score) on the Princeton Review's Green Rating tallies to be awarded this title.
- Cornell registered the fourth largest carbon reduction for campuses over 16,000 sq ft.
- Decrease in net GHG emissions by 36,400 mtCO₂e from 203,000 in mtCO₂e 2019 to 166,590 mtCO₂e in 2020 and a 48% reduction from the 2008 baseline. Note this reporting year is affected by COVID-related operational changes by as much as 10%. Learn about Cornell's baseline GHG metric [here](#).
- July 29: Cornell awarded \$7.2M grant to research [Earth Source Heat \(ESH\)](#). Research will be conducted in a 2-mile-deep borehole, where researchers will evaluate the feasibility of using ESH.



- The National Science Foundation has awarded Cornell a 5-year, \$1.5 million grant to research [algal bloom impacts](#). These include changes in food webs and potential socioeconomic challenges due to algal bloom toxicity.

- The New York State Energy Research and Development Authority (NYSERDA) has granted Cornell [\\$1.65](#)

[million in incentives](#) for energy studies and project work to decrease our carbon footprint.

- The National Science Foundation has given Cornell engineers and researchers a \$1.5m grant to [close New York State's digital divide](#) by creating an Internet of Things (IoT). The IoT refers to everyday items being connected digitally (an IoT thermostat can be controlled remotely via WiFi). The Cornell Cooperative Extension will be implementing this via a low-power wide-area network (LPWAN), to allow measuring and use remotely.
- March 7: Cornell's renewable energy grid covered all of [campus real time energy needs](#) for the first time ever.
- Cornell building care has greatly [decreased the amount of chemicals](#) used in floor treatments. Cornell has decreased the amount of floor-stripping chemicals from eight to one, floor finishing products from 13 to two, and now has one universal floor cleaner. This protects staff, students, and the environment.
- September 21: Interactive annual [sustainability report](#) is released. The 2019-2020 report features a summary of sustainability progress on campus for the past year, including a timeline of significant events, student-led campus innovations, and Cornell's path to carbon neutrality.
- The U.S. Department of Energy has given Cornell a \$1.5 million grant to explore [integrated reuse of industrial waste](#). Steel industry produces sludge, slag, dust, and CO₂, which are hazardous to the environment and difficult to discard. This grant will aid Cornell researchers in finding a better, sustainable way to reintegrate these materials.
- May: Cornell's Board of Trustees [voted](#) to put a moratorium on fossil fuel investments.
- [Dimensional Energy](#), a Cornell McGovern Center startup company that can capture industrial carbon dioxide and then convert it by way of sunshine into environmentally friendly products like aviation fuel, has emerged as one of two finalists in the \$20 million Carbon X Prize competition.
- [Patrick Reed](#), the Joseph C. Ford Professor in the School of Civil and Environmental Engineering, received a \$1.4 million grant from the U.S. Department of Energy to aid in the research and development of better projections of the outcomes of human interactions with the natural world.
- Cornell wind energy scientists have released a [Global Wind Atlas](#) to aid engineers in selecting turbines in varying regions and accelerating the development of sustainable energy.
- Walmart, as part of their emissions reduction project "Project Gigaton," is using the Cornell CALS-developed GHG accounting tool [FAST-GHG](#) to quantify their greenhouse gas emissions in crop production.

- [Energy setback](#) for winter and spring breaks. Every year, Cornell reminds its students, faculty, and staff to unplug their electronics, turn down (or up) their thermostats, and ensure everything is in order before leaving for break. These small actions save huge amounts of energy (the winter setback 2019 saved 1.2 million kWh of energy (i.e., the energy of 98 homes for one year).
- Cornell dining introduced a reusable takeout container program to avoid paper and styrofoam container waste in the era of takeout-only dining.

Downtown Ithaca Alliance

- The Downtown Ithaca Alliance (DIA) in collaboration with Center for Community Transportation and Tompkins Consolidated Area Transit (TCAT), is currently operating a Transportation Management Association (TMA) program called GO ITHACA aimed at helping employees and residents in the urban core forgo their single-occupancy vehicles and instead use more efficient modes of transportation. This program helps reduce carbon emissions by thousands of pounds and promotes health, social engagement, and employee and resident goodwill by incentivizing commuters and residents to walk, bike, and carpool to get to and from work and complete errands. The New York State Department of Environmental Conservation grant funds was applied for to capitalize a project that will create individualized transportation plans along with a suite of new transit services (including remote parking) to workers and residents in the urban core.
- The DIA continues to work on a transit corridor plan to improve bus service between Downtown Ithaca, campus communities, and other cities. Downtown Ithaca is the regional transit hub for Tompkins Consolidated Area Transit (TCAT), which was recently recognized by its industry peers as being the best transit system of its size in North America. TCAT contributes greatly to the community, serving as an alternative to car ownership, thus reducing traffic congestion and greenhouse gas emissions. It saves the cost of building parking facilities. Its fleet currently includes eight electric-diesel hybrid buses.
 
- Downtown projects such as the additional bike racks that were installed thanks to a grant from a local foundation will decrease dependency on automobiles and increase walkability and access to public transit.
- The City Centre project includes many green features such as energy-efficient windows and lighting and classic sustainable appliances like low-flow toilets. City Centre is also eliminating the need for venting to accompany clothes dryers, which are outfitted with heat pumps (standard practice in Europe, but a burgeoning innovation in the United States).
- The Harold's Square project is an energy-efficient building aligned with the values of the local community and offering apartments that are more efficient, cost-effective, and comfortable. Designed per NYSERDA and ENERGY STAR® standards, Harold's Square provides the following: efficient heating and cooling system and hot water heater; improved building envelope and air-tight compartmentalization of apartments; Energy Star appliances that use 10-30% less energy than conventional models; efficient LED lighting; water-saving fixtures; and investment in off-site 60.3-kilowatt solar farm to further offset fossil fuel-generated power usage. Overall, the building will use at least 35% less energy than a similar type conventionally built building.
- Downtown Ithaca continues to be a “walker's paradise” where daily errands can be completed without using a vehicle, according to Walk Score. Walk Score is a tool that rates the walkability of more than 10,000 neighborhoods throughout the continent. The numerical Walk Score for the Ithaca Commons is 97 out of a possible 100, the same as it was in 2019. Our Walk Score is just Two-percentage points shy of Greenwich Village; by contrast, Lansing's walk rating is 38, Trumansburg's ranking is 37, and Cayuga Heights ranks 28.
- Solar trash compactors along the Commons help to reduce the carbon footprint. These



compactors compress their contents to allow more trash per bag, so they don't have to be emptied as often. Fewer collections mean cost-savings for labor, fuel, and maintenance as well as reduced greenhouse gas emissions. Powered by the sun, these eco-friendly compactors operate in every kind of weather — snow, rain, or shine. The DIA has coordinated a shared recycling and trash compactor program to encourage proper disposal of recyclable materials generated by over 300 businesses and residents on and around the Commons.

- Downtown Ithaca is home to the headquarters of the Center for Community Transportation which houses Ithaca Carshare, a non-profit car-sharing service with a growing fleet of fuel-efficient vehicles shared by over 1,500 members. Users can save hundreds of dollars per month in avoided gas, maintenance, and insurance costs while reducing traffic congestion, pollution, and space and money devoted to parking. Independent studies show that for each Carshare vehicle, over 15 privately-owned vehicles come off the road.
- Bike Walk Tompkins, a program managed by the Center for Community Transportation, has taken the lead on bringing a bike-share program to downtown Ithaca as part of its Blueprint for Better Bicycling program. As the number of people who use this bike-share program increases, we'll see a reduced number of people using their vehicles to travel around downtown, thus reducing greenhouse gas emissions in our area.
- Downtown's seasonal vinyl banners located on the Commons light poles are recyclable. For example, our 2020 Chili Cook-Off banners were upcycled, transformed into stylish, wearable aprons.
- To help reduce the use of plastic and paper bags in the urban core, many businesses in the downtown community now sell reusable, environmentally friendly shopping bags.
- In 2019, the DIA started exploring the option of offering bike parking at its special events to help in local efforts to lessen the number of vehicles traveling into the urbanized core, thus reducing greenhouse gas emissions in the community. As soon as we start hosting in-person special events on the Commons again, we plan to add bike parking to the events.

- Press Bay Alley, two blocks southwest of the Ithaca Commons, offers a Food Hub where people can pick up fresh produce, baked goods, and other items. The Alley also serves as a pickup spot for the Full Plate Farm Collective CSA (Community Supported Agriculture). CSA is a cooperative relationship between a farmer and consumers; consumers commit to buying a crop "share" and growers commit to growing that amount of produce. Full Plate Farm Collective farms grow over 50 acres of organic vegetables and share the vision of building community, farming with integrity, and growing high-quality food with fair prices for all involved.



- Downtown Ithaca is an important green retailing showcase with at least 12 independent, locally-owned stores that specialize in reused and recycled products. Such stores include SewGreen, Pastimes Antiques, Trader Ks, Autumn Leaves Used Books, and Home Green Home. Shopping at reuse stores means less additional energy was used to produce new goods. Another business, The Watershed, located in the Downtown Ithaca Business Improvement District, is committed to reducing environmental waste. Behind the bar, they use high-end citrus products instead of fresh fruit to decrease food waste without compromising on drink quality. In a standard bar, it takes about four pounds of ice to chill a glass and shake a cocktail, but at The Watershed many of the drinks are built in the glass to lessen the amount of ice and water used in the bartending process. With a menu constantly changing based on what's



available, Watershed opted for digital menu boards instead of going through a wasteful cycle of updating printed menus.

- Decorative lighting in Downtown Ithaca is energy efficient. The DIA uses LED lighting to decorate the poles on The Commons during the holiday season.

- Downtown living is sustainable living. According to the Center for Sustainable Economy, a couple living in an apartment in downtown Ithaca, using TCAT, and adopting excellent green habits (e.g. unplugging appliances, composting, buying organic food) will have a carbon footprint of approximately 34 percent of the national average. A couple with the same commendable habits but residing in a single-family home outside of town and commuting in a mid-size car would be at 76 percent. Allowing for more vertical growth will allow more in our community to take part in this green

revolution.”

- The DIA has implemented composting and recycling systems for its major downtown events — The Apple Harvest Festival, Summer Concert Series, Chowder Cook-Off, and Chili Cook-Off — that are attended by over 100,000 locals and tourists. Local service organizations like the Master Composters from Cornell Cooperative Extension have helped to oversee these composting stations.
- The DIA also offers and encourages the use of reusable cups during the Summer Concert Series and offers reusable spoons and encourages attendees to bring their own reusable spoons and mugs for its Chowder Cook-Off and Chili Cook-Off.
- Downtown Ithaca is home to Coltivare, a farm-to-table restaurant and bar as well as a major culinary education facility. Coltivare, an initiative of Tompkins Cortland Community College, offers a unique hands-on experience alongside working professionals for students studying sustainable food systems and entrepreneurship. The team aims to find all their menu items within a 300-mile radius, with some food sourced from the college’s own farm. Its waste management system, which reduces food scraps to a grain-like compostable material to be used by the farm, is the first of its kind in the U.S.
- In 2021, the Downtown Ithaca Alliance will install dog waste bag dispensers on the Commons that include compostable bags.

EMPEQ

- 2020 was a year unlike any we’d faced before. Nonetheless, against the odds, EMPEQ has weathered the storm and is emerging from the COVID-19 era as a stronger company.
- In 2020, we completed over 150 contractor interviews through the [National Science Foundation's](#) (NSF) [ICorps](#) customer discovery “National Teams” program. EMPEQ decided to expand our Visibility software platform to include a smartphone app with proprietary AI algorithms that use what we call “Intelligent Equipment Identification” to give HVAC contractors and energy engineers the capability to identify a piece of equipment to be retrofitted *simply by snapping a picture of a unit on their smartphone*. These AI algorithms will only improve as more photos are added. This technology greatly increases our ability to help HVAC contracting and engineering customers replace energy inefficient equipment much faster than ever before and it has the added benefit of lowering the barrier for entry for workers in an HVAC contracting industry dealing with a major labor shortage.
- Regarding financing, 2020 brought many highlights. Some of the most noteworthy include:
 - We came to terms on the acquisition of a 36-year commercial equipment financing company.



- After beginning 2020 with one financial product – the UnFinancing SubscriptionSM – we now have over ten, including traditional instruments like loans and leases and other proprietary off-balance sheet financial products.
- We expanded our banking and equity partnership base from 1 to 14 and expanded our capacity for lending to \$5 billion.
- In Q4, we finalized an agreement with two large financial institutions to offer instantaneous approvals, up to \$250,000, with nothing more than a few pieces of company information – no P&Ls or balance sheets are needed.
- COVID-19 certainly played a role in the slowdown of all equipment financing in 2020 and this was felt acutely in energy efficiency and clean energy. However, even in the middle of the pandemic, we doubled the total amount of projects financed since 2019.
- EMPEQ also earned four grants totaling \$86,500 in 2020. Most notable was the US Department of Defense’s [Small Business Innovation Research](#) Phase I. Working with the Air Force, EMPEQ received \$50,000 for research and development on its proprietary Intelligent Equipment Identification artificial intelligence product. The other grants include the National Science Foundation (\$30,000), the Northeast Clean Energy Council (\$3,000), the Southern Tier Cleantech Incubator (\$1,500), and other miscellaneous grants.
- EMPEQ also received an investment of \$30,000 from Social Ventures Circle and \$25,000 from SUNY RF.
- Ultimately, 2020 saw the company expand its business model and experience great product-market fit with our software platform. We were also able to use the economic downturn to build up our technology, better define our customer and onboarding process, and develop a scalable sales strategy. While the year tested the mettle of our team in many ways, we are confident that we’ve positioned ourselves for fast success in the post-pandemic world.

Finger Lakes Land Trust

- During 2020, the Finger Lakes Land Trust completed six land protection projects that conserved more than 600 acres within Tompkins County. Within the Emerald Necklace Greenbelt, the Land Trust acquired a 143-acre nature preserve that will be formally opened to the public during 2022. An adjacent parcel of woodlands was also acquired and will be added to Danby State Forest. The Land Trust also added a 66-acre parcel to Connecticut Hill – the state’s largest wildlife management area and a popular destination for outdoor recreation that saw increasing public use during the pandemic.
- With financial support from Tompkins County and the Town of Dryden, the Land Trust also completed a conservation easement on the 300-acre Prince Farm. Located on both sides of State Route 13, the Farm features productive agricultural land as well as wetlands and woodlands that help filter runoff to nearby Fall Creek.
- As the Land Trust protected additional land, the organization also focused on its stewardship of lands already under its protection. At Lick Brook Gorge, site improvements were completed that include trail resiliency improvements as well as a new professionally designed interpretive kiosk. At the Lindsay Parsons Biodiversity Preserve, meadow restoration efforts removed invasive brush and enhanced nesting habitat for native grassland birds.



Finger Lakes ReUse

Following a temporary voluntary closure of public-facing operations due to safety concerns at the beginning of the COVID-19 pandemic, Finger Lakes ReUse programs grew in 2020. Our ReUse Materials Access Program (ReMAP) continued as an essential service during our temporary closing for local people in economic distress. We also launched an interim online shopping platform, continued to offer local

pickups of materials for a fee, coordinated a mask-making effort with Tompkins County utilizing local used textiles, and are actively continuing to revise our operations plans to protect the safety and well-being of our workers and prepare for future developments. All of our operations and offices established new COVID-19 safety measures, 100% of our furloughed staff were offered full reinstatement, and we have been able to hire additional staff as we expanded into additional locations in 2020.

In 2020, Finger Lakes ReUse:

- Held a ReUse Town Hall at Cinemapolis in the first quarter of the year with over 80 attendees.
- Expanded our Triphammer ReUse Center location into the adjacent former Ace Hardware space, rebranding the combined location as the ReUse MegaCenter with over half an acre of used materials for sale.



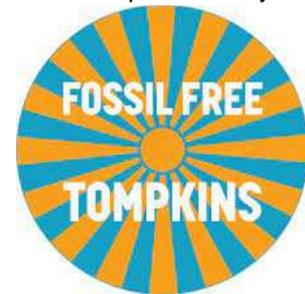
- Popped up into a new space at 700 W. Buffalo St. in Ithaca NY, a combined operation that offered a pilot ReUse Training Center, pop-up retail location called the ReUse Caboose, and a critical ReUse Warehouse that is helping manage overflow materials into 2021.
- Offered first-time and early job experiences to 21 young people (ages 14-24) thanks to funding from the Lane Family Fund via the Community Foundation of Tompkins County and partnership with the Summer Youth Employment Program in Tompkins County.

- Completed a pilot Training Center effort in partnership with Cornell Cooperative Extension, offering green energy skills training to seven local people in need of career development.
- Accepted 20,930 donation drop offs at our three active locations.
- Partnered with the Tompkins County Health Department, TST BOCES, the Tompkins Chamber of Commerce, Tompkins County Public Library, and local mask makers and entrepreneurs in April and May to provide enough fabric to produce thousands of reusable masks for local essential businesses. For three weeks ReUse volunteers and staff sorted through nearly two tons of textiles, pulling fabric usable for making thousands of reusable face masks.
- Diverted an estimated 488 tons of materials (440,000 items) through our three locations, including furniture, building materials, housewares, electronics, books, textiles, appliances and more.
- Created 20 full-time equivalent (40-hours/week) jobs.
- Worked with local human service agencies through our ReUse Materials Access Program, providing materials for 373 local people in need.
- Partnered with Cornell's Dump & Run program (Cops, Kids and Toys and National Alliance for Mental Health - Finger Lakes Chapter) to host a "ReUse & Run" sales series outdoors (masks required) in the summer of 2020.
- Worked alongside 63 new volunteers in 2020 logging 14,980 hours of work with us

Fossil Free Tompkins

Although the pandemic slowed some aspects of Fossil Free Tompkins' work – no more trips to Albany – much of our activity continued via Zoom.

NYSEG Rate Case; As reported in our 2019 summary, NYSEG/RG&E filed their gas and electric rate cases with the Public Service Commission (PSC) in May 2019. The Rate Case is a legal proceeding where the utility proposes rate increases for various infrastructure and administrative projects along with basic operating/maintenance expenses. The period between May and September 2019 provided time for reading the various filings, asking written questions, and getting answers. From September 2019 through July 2020, FFT and other stakeholders were engaged in confidential negotiations regarding the proposals, and we were instrumental in several results that we won on behalf of ratepayers and the environment. These included first-of-their-kind concessions from the utility regarding gas



infrastructure: an agreement to aim for no net increase in gas use across their service territory and to offset any gas growth with non-gas alternatives such as energy efficiency and heat pumps; to conduct a benefit-cost analysis comparing efficiency/heat-pumps before undertaking any new pipeline project; to provide \$1.5 million subsidies for low-income residential heat-pump projects and \$3.1 million for commercial heat pump projects; and to do a planning study on the financial impacts of coming into compliance with the State's Climate Leadership and Community Protection Act given the likelihood of stranded gas assets and how to mitigate those impacts. In addition, we initiated discussions and achieved multiple provisions in response to the COVID crisis, including suspended disconnections, late charges, disconnect and reconnect fees; \$16.5 million for up to \$100 per customer bill credit, arrears forgiveness, flexible deferred payment plans and \$3 million for a COVID-19 grant assistance program for commercial customers.

Lansing Non-Pipe Alternative Proposals: Fall 2019 saw the release of NYSEG's RFP for non-pipe alternative projects to address reliability concerns in the Town of Lansing. In March 2020 NYSEG received 16 responses to the RFP. Technologies proposed varied from non-gas solutions such as heat pumps (air, ground, water, community loop), heat recovery, energy efficiency measures, hydrogen injection, dynamic electrification, a demand response thermostat program, and outreach and education to gas injection solutions such as compressed natural gas (CNG) and liquified natural gas (LNG). By September 2020, NYSEG had evaluated the proposals and filed a petition with the PSC seeking approval for several projects in the Lansing area to reduce gas demand and/or convert to heat pumps. Among the projects included in NYSEG's petition were a consortium of heat pump installers that will install 200 residential heat pumps over three years; a ground-source heat pump system and efficiency upgrades in a non-residential building; ground source heat pump and energy efficiency improvements at the Tompkins County International Airport; a community district geothermal loop system in a lakefront neighborhood; and heat recovery and energy efficiency measures at one of the County's largest industrial operations. In the good news category, NYSEG did not recommend pursuing CNG, renewable natural gas (RNG), or hydrogen solutions. In June 2021 the Commission ruled on NYSEG's petition, supporting all the projects NYSEG recommended except the geothermal system at the County's airport. The County is currently contemplating an appeal of that ruling. Altogether the NYSEG portfolio of recommended projects would reduce gas demand by 56.34 thousand cubic feet per hour (MCFH) and would bring over \$9.6 million investment to the community.

Gas Planning Proceeding: In March 2020, the PSC initiated the "Gas Planning Proceeding" in part to respond to gas moratoria in various parts of the state, as well as to bring utilities gas planning into alignment with the goals of the State's Climate Leadership and Community Protection Act. No doubt this proceeding was also in response to the participation of environmental organizations (including FFT) in several utility rate cases, where the mismatch between the utility industry's business-as-usual thinking and the State's climate goals became apparent. Fossil Free Tompkins helped to spearhead an effort by members of the Renewable Heat Now (RHN) coalition to develop comments that could potentially influence inform the NYS Department of Public Service (DPS) recommendations. Among other things, the



RHN comments advocated for clear GHG reduction goals with year-by-year targets for the utilities to meet and an orderly, just transition plan for getting off gas that would minimize stranded assets and ensure affordability for all. After 11 months and seven extensions, in February 2021 the DPS staff finally issued their preliminary recommendations for gas planning, recommendations that were astonishingly bad. There were no calls for the utilities to provide clear targets for GHG reduction, no plan for an orderly transition, no plan to assess or address risk of stranded assets, and no plan for ensuring affordability. RHN submitted reply comments to the DPS

proposal, and FFT submitted separate supplemental comments based on our experience with the Lansing moratorium and non-pipe alternative process. One bright note: FFT advocated and DPS staff supported the idea that within a moratorium area, as gas was "liberated" because of efficiency measures, utilities should be allowed to preferentially allocate the liberated gas to essential uses such as industrial

development where alternatives to gas were insufficient so that economic development was not permanently thwarted by the moratoria.

Greenidge and the Behind-the-Meter Loophole: In June 2020, the Public Service Commission issued a declaratory ruling allowing that the old, coal-to-gas Greenidge power plant on Seneca Lake could utilize the power it generated onsite to support a bitcoin mining operation on their property. Upon reading the ruling, FFT noted that the power plant owners had found and exploited a loophole in the CLCPA. While the CLCPA requires 70% renewables in the grid by 2030, it does nothing to impede fossil fuel generating facilities from supporting behind-the-meter operations. FFT has spent much of 2020 and 2021 working to raise awareness of this loophole and finding ways to fix it. In the process we learned that the NYS Department of Environmental Conservation has no specific way to track behind-the-meter emissions and that air permits are issued relative to the plant’s potential to emit rather than historical actual emissions.

Get Your GreenBack Tompkins

Overview

For this year we had one primary goal: to continue to offer energy advising to thousands of people throughout the region, helping hundreds of them take meaningful action, while increasing the effectiveness of the advising system. Despite the setbacks imposed by the pandemic, we have been able to accomplish this goal and have made significant progress in all of the related elements, as detailed below.

a. Energy Advising

While the pandemic has significantly curbed our ability to do in-person outreach and has thus reduced the number of people we have been able to engage and support, we have still been able to reach thousands of people using other approaches such as television and partner referrals and we supported 170 in taking action. The numbers below represent our cumulative impact through October 2020.

2020 Cumulative Impact (through October)		
# Reached	# Supported	# Steps Taken
3,097	878	170

While the number of steps taken and reported to GYGB is less than the previous year (267), we are proud of the support we’ve been able to provide. As in past years, many of the people we advise may take actions on their own without informing us, so our numbers are undoubtedly an undercount. Also the last two months of the year may provide a significant boost to the numbers due to a surge of interest during the cooler fall months.

The energy advising work continues both in Tompkins County, and in the eight-county Southern Tier region, where we coordinate the work through the Smart Energy Choices program funded by NYSERDA.

b. The PowerHouse

The tiny home PowerHouse has been built and is already scheduled for a number of outreach venues. Having completed the design of the home and its exhibits over the last two years thanks in great part to student interns from Cornell University Sustainable Design, we were able this year to secure funding from NYSERDA to build the tiny home. The home is on a trailer and can travel in the region to do energy outreach and education, both with general audiences and with schools.



Major components of the PowerHouse include:

- Solar and battery storage to power the lights and heat pump, making the home available for use throughout the year.



- A set of interactive displays on lighting, insulation, air sealing, heat pumps, and solar, that can help visitors learn about all the major steps needed to achieve a net-zero home.
- Digital displays showing solar production and energy usage.
- Reuse materials, including a table made with a donated old chalkboard from Significant Elements, cabinet knobs from the ReUse Center, and lamps from Mimi's Attic.
- A [companion website](#) that includes more detailed information on the energy topics included in our exhibits, as well as an interactive quiz and a quick and easy way to request follow up energy advising support.

c. Energy Navigators

In addition to securing support from NYSERDA for the construction of the PowerHouse, we were also successful in securing NYSERDA funding to support the expansion of the Energy Navigator program. We revised the original curriculum to make it relevant to the state (previously it was centered on Tompkins County) and trained four staff from other Cornell Cooperative Extension offices throughout the state. They conducted their own trainings in the summer of this year and are currently working with over 40 volunteers in five counties: St. Lawrence, Chemung, Dutchess, Sullivan, and Ulster. The volunteers are now engaged in energy outreach and education with their own networks. All of the training and support is taking place remotely. While unanticipated, we have now tested the curriculum in a remote learning setting and it seems to be working. We hope that the respective counties will be able to sustain this work in the future.



Due to the pandemic, we did not hold another round of training in Tompkins County this year; instead, we focused on supporting some 15 existing Energy Navigator volunteers who wanted to continue with their service. Some have helped build the PowerHouse and its exhibits (see photo above); another has focused on supporting businesses and non-profits with a program that subsidizes the installation of electric vehicle charging stations (see [this story](#) of one such success); and others have provided the one-on-one advising to friends, neighbors and other contacts that helps them navigate the steps to energy efficiency, renewable heating, solar, and electric vehicles.

c. Workforce Development

In our proposal to the Park Foundation, we indicated that we were interested in exploring the issue workforce development, with a focus on the clean energy industry. According to NYSERDA, to reach the state carbon emission reduction goals by 2050, we need to increase our workforce trained to do energy efficiency work and heat pump installations by a factor of ten, beginning in 2021. This seems like an incredible opportunity to bring well-paying jobs to under-served and marginalized populations. During the 2020 summer we had a team of three interns from Cornell's school of management research green job workforce programs in the country. They identified the "Roots of Success" program as a leader in the field of green job workforce development and based on their recommendation the coordinator received training in using the Roots of Success curriculum. He is currently supporting a small pilot effort with a CCETC colleague in collaboration with the ReUse Center, where they are using the Roots of Success curriculum to train a small group of people in green jobs while building up skills by working at the ReUse Center at the same time. The GYGB coordinator is continuing to network with others in the county who are interested in furthering this type of programming, with the goal of putting together a plan for a more robust green job workforce development program and proposal in 2021.

d. Other Initiatives

In addition to the focused work described above related to energy advising, education and outreach, we have also led and supported a number of other initiatives:

- **Reuse Trail** - Once again, working with over 30 stores we are continuing the work of the Reuse Trail, and will soon be reprinting 15,000 copies of a new edition of the rack card which is distributed throughout the stores and other venues in the county. For this round, we counted on the support of stores taking on more of a lead in designing and distributing the rack card. The participating stores continue to pay for the printing costs.
- **Earth Day 2020** – Noticing that there was no one organizing Earth Day in 2020 (its 50th year!) and that many people were isolated due to the pandemic, Get Your GreenBack Tompkins stepped in to organize an all-online celebration.



Working with the director of Southside Community Center, Tammy Butler, Kirby Edmonds from DCI/Building Bridges, and Rebecca Evans from Ithaca College/Sunrise, the GYGB coordinator helped orchestrate a four-plus hour celebration with over 50 presenters

and hosts from a wide variety of organizations. The event was held on Zoom and broadcast simultaneously live on Facebook Live. A significant proportion of presenters and hosts were people of color. Videos of the four hour-long sets can be found on [GYGB's Youtube page](#) and a copy of the entire event can also be found on [our Facebook page](#). According to Facebook, the event reached over 10,000 people, with over 4,000 views and a significant number of interactions (see screenshot above).

- **Communications & Media** – We continue operating four websites—Get Your GreenBack's, Smart Energy Choices, the Reuse Trail, and the PowerHouse—and two Facebook pages for GYGB and Smart Energy Choices. We produced almost-monthly newsletters and blog pieces and received some good local media coverage.
- **Supporting & Influencing Other Projects** – GYGB continues to support many other initiatives, including Bike Walk Tompkins and Building Bridges (the GYGB coordinator serves on their Steering Committees). In addition, the coordinator has served on the City of Ithaca's Green New Deal interim advisory committee, providing input into the City's efforts towards carbon neutrality by 2030.



HeatSmart Tompkins

Lisa Marshall, Program Director and Brian Eden, Board Chair

2020 was a banner year for HeatSmart Tompkins despite the challenges that came with the COVID-19 pandemic. In April we launched new campaigns for residential buildings with our NYSERDA grant that will

take us through March 2022. We continued to focus our outreach efforts on Tompkins County, with special emphasis on the Town of Lansing, while also expanding into Chemung County.



The coronavirus lockdown required us to develop a business continuity strategy. We needed to completely revamp our model and methods for community outreach. Relying no longer on the in-person community meetings, home tours, and house parties, we switched to a webinar format and redesigned our presentations to be shorter, more focused, and more interactive. We also designed a virtual learning room on our website where visitors could create their own learning experience. Over the summer with the assistance of our interns and several generous volunteers, we developed a collection of case studies and video home tours on HeatSmart homes highlighting the various kinds of heat pump systems. Our fall webinar series included virtual home tours where we showed the videos

and invited the homeowner and contractor to be present to talk about the project and answer questions. We also presented installer case studies where each installer was invited to conduct an in-depth presentation on a single project. Installing contractors adopted new methods for virtual energy assessments and extensive safety protocols when working in resident's homes. We continued to conduct enrollee surveys to assess their satisfaction with our efforts as well as homeowner's relationship with the installing contractors.

NYSERDA launched several initiatives as part of the state's economic recovery plan that drove enrollments. In June, there was an offer of 0% financing for heat pump installations and weatherization. This was followed by increased grants and expanded eligibility for grants through two programs that are designed to assist low-to-moderate income households, EmPower and Assisted Home Performance.

In August we celebrated Jonathan Comstock's leadership and legacy in his roles since our founding as either the Board Chair or the Program Director with a small, socially distanced outdoor retirement party at Taughanock Park. On September 1 Lisa Marshall became the new Program Director.

We finished the year in strong shape with the launch of an exciting pilot study that provided funding for heat pump installations in 500 low-to-moderate income households statewide. The "Heat Pump Demonstration Pilot Study" led to record interest in our program (94 enrollments in December alone!) making heat pumps available to a whole new segment of our community.

Our marketing efforts were greatly expanded thanks to generous matching funds provided by NYSERDA. With the creative guidance of our communications consultant, Kitty Gifford, our outreach team designed and launched innovative postcard mailings and ads on radio and social media which have been emulated by other HeatSmart programs across NYS. We were invited to present on our marketing efforts at NYSERDA's annual Clean Heating and Cooling Conference in December.

We continued to partner with Ithaca Area Economic Development and the County's Business Energy Advisor in the BEA Lansing program to support commercial businesses in their adoption of expanded energy efficiency and high performing electric energy heating and cooling systems for existing buildings in Lansing. This program provides outreach and technical assistance for existing facilities \geq 3,000 square feet in the Lansing natural gas moratorium area.

HeatSmart Tompkins continues as a formal party in the Lansing Non-Pipe Alternatives Proceeding. NYSEG had declared a moratorium on new gas hookups in 2015 to address the concerns of insufficient gas supply to maintain the reliability of the system. Our community has stated goals to reduce its carbon footprint and to eliminate non-renewable fuel options. New York State's recently adopted CLCPA legislation requires aggressive emissions reductions. A list of NYSEG approved non fossil fuel options has been submitted to the PSC for their action.

In 2020 we conducted two sets of workforce training programs, Air-Source Heat Pump Installations Without Call-Backs, each consisting of three webinars and a day of field training. One of the field trainings

involved the installation in the fall of a whole house air-source heat pump system at a Habitat for Humanity House on Slaterville Rd.

Perhaps what we are most proud of at HeatSmart is how we have mentored similar programs across the state. Both Lisa and Brian stretch their time to include advocacy work with the Renewable Heat Now campaign that is focused on energy efficiency and clean heating policy. In conjunction with Renewable Heat Now we also have initiated a new level of collaboration among the now 23 HeatSmart programs in NYS and other individuals and groups both in NYS and in other states who are aligned with our work. In 2020 the oversight for most of the Clean Heating and Cooling incentive rebate programs was transitioned from NYSERDA to the NYS utilities. HeatSmart Tompkins has a standing monthly meeting with NYSEG staff to assist with a smooth transition of these responsibilities.

We were a formal party to the NYSEG/RGE Rate Case Negotiations in the period October 2019 - May 2020. The gas utility portion of the agreement, which was called “a model for future rate cases” by regulators includes a number of gas reduction strategies, retraction of \$128 million for gas infrastructure including pipelines, and funding of



\$1.5 million for renewable heating systems for low-income residents on top of the utilities' other incentives for renewable heating and energy efficiency. Importantly, as part of the agreement, NYSEG and RG&E also committed to planning for no gas growth (offsetting new gas customers with heat pumps and efficiency), to stop marketing gas (“Convert to Gas” has occupied a prominent place on their website front page menu bar), and to seek alternatives to nearly all new gas investments. In the electric case, we were unable to reduce the rate increases as much as we had hoped. The PSC Order provided far too little investment in correcting years of deferred maintenance on the substations, distribution lines, and the full cycle vegetation management needed to maintain system reliability while approving the discretionary initiation of an expensive smart meter infrastructure program. A program of beneficial electrification with heat pumps requires a robust electric grid.

In conjunction with Renewable Heat Now, we prevailed upon the Public Service Commission (PSC) to introduce a generic gas planning proceeding. A managed, equitable, affordable transition from fossil fuels to renewable energy is in the best interests of all New York residents. It is incumbent upon the PSC to enact a well-researched, comprehensive plan to align New York's gas utilities with the Climate Leadership and Community Protection Act (CLCPA). We must ensure all New York residents have the energy needed for heating, hot water, and cooking, and that access to renewable options for these services is provided in a timely, orderly, and affordable manner.

A major infrastructure bill designed to put people back to work as well as address the needs of an aging infrastructure has been on the agenda of the Congress for the past year. We have participated in discussions with our Congressional representatives to ensure that clean energy systems are well represented in the final bill. We have proposed the Community Electrification, Green Buildings and Jobs Act that would train workers and create thousands of jobs in clean thermal energy infrastructure by installing air source heat pumps, geothermal (ground source) heat pumps, and community district-wide geothermal heat pump systems for residences and commercial and public buildings.

HOLT Architects

- HOLT continued championing and participating in the efforts of TCCPI and its flagship project, the Ithaca 2030 District, through:
 - In-kind contribution of Andrew Gil's time serving on the TCCCPI Steering Committee.

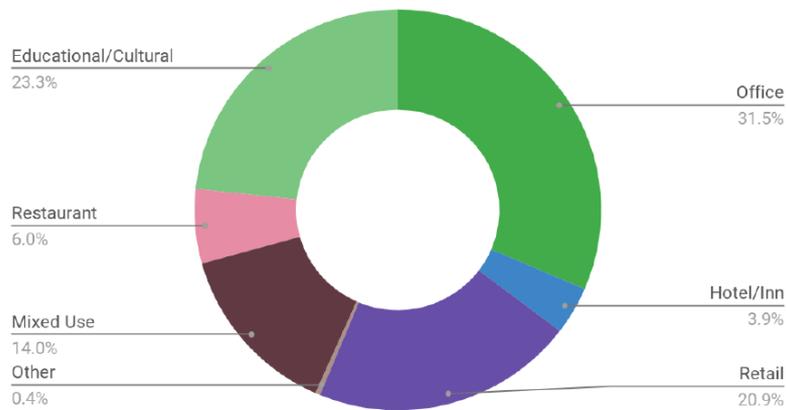
- In-kind contribution of Andrew Gil's time serving on the Ithaca 2030 District Advisory Board, and reviewing/contributing to the submission requirements of the NYSERDA Grant for establishing the Ithaca 2030 District,
 - HOLT hosting the Ithaca 2030 District Quarterly Building Owner's meetings in the first three of the quarterly meetings.
- HOLT has continued to investigate methodologies for better understanding the energy needs of its 619 West State Street offices as well as potential actions for lowering the overall energy use. HOLT used the real-time monitoring from the "Internet of Things" monitoring, along with a one-month data collection/recording device installed on rooftop Air Handling Units to help analyze if, and how, the HVAC mechanical equipment at 619 West State Street might be more efficiently operated.
 - HOLT renewed its prior commitment to the AIA2030 Challenge and will be tasking all project managers with entering their projects performance metrics data in the AIA2030Dx website. The AIA 2030 Challenge is based on the original Architecture 2030 Challenge, which was the basis of the formation of the 2030 Districts.
 - HOLT has committed to incorporating into its practice knowledge and expertise with The Well Building Challenge and will be pursuing Well Building certification of its offices.
 - HOLT and Cayuga Medica Center are pursuing LEED v4.1 and WELL v2 certification with the proposed downtown Medical Office Building. The project will also meet the NY Stretch Energy Code as well as the Ithaca's Energy Code Supplement and with NYSERDA's New Construction Program.
 - HOLT Principal Associate Cindy Kaufman, together with LEED APs Andrew Gil and Catherine Blakemore and Well Building-Accredited Architect Krysta Schell, established a committee to research known harmful chemicals in building products and materials, specifically to:
 - Identify harmful chemicals by category of harm (e.g. mutagenic, carcinogenic, etc.) and to develop or adopt a system that identifies those that are considered to be most harmful and therefore help identify those products that would be banned from projects designed by HOLT Architects.
 - Investigate/analyze/develop a means of identifying those products and materials that incorporate those chemicals identified as posing significant risk to occupants of buildings.
 - HOLT assisted three clients with proposed building projects to be located in the City of Ithaca, through the City of Ithaca's Ithaca Green Building Policy's Energy Code Supplement review process.



Ithaca 2030 District

- By the end of 2020, the Ithaca 2030 District consisted of 25 property owners, 29 buildings, and a total of 375,371 square feet of committed space. Members added in 2020 included:
 - Sciencenter
 - Kitchen Theatre
 - GreenStar Co-Op
 - William Henry Miller Inn
 - Town of Ithaca (Town Hall)
- Overall, the distribution of buildings across property types is as follows:

PROPERTY TYPE BREAKDOWN



- We continued to refine our interactive building performance dashboards for the property owners and managers, and we carried out reviews on Zoom with the owners or designated building managers to make sure that they understood how to operate the dashboards and to see if they had any questions. The dashboards track progress regarding energy and water consumption at both the individual building and district levels.
- As a District, we met the 2020 targets – a 20 percent reduction from the baseline – for energy, water, and transportation emissions. Specifically, we reduced our energy consumption by 21.5% from the baseline. In addition, we realized savings of 42.7% in water use and 21.9% in transportation emissions. As impressive as those numbers are, we still have quite a ways to go to meet the targets of 50% reductions in energy, water, and transportation emissions by 2030. The full 2020 annual progress report can be found [here](#).
- We continued to collect monthly utility data for the property owners and uploaded to Portfolio Manager to determine EnergyStar scores and we carried out our second annual commuter transportation survey of member buildings.
- We held monthly Advisory Board meetings and four District Partner meetings on Zoom as well as published four issues of the e-newsletter. The District Partner meetings bring together the property owners and other stakeholders to discuss issues of mutual concern and provide updates on the progress of the 2030 District.
- The executive director attended monthly meetings of the executive directors in the network to discuss issues of mutual interest, and he participated in the annual 2030 Districts Network Summit, all of which took place on Zoom.
- In November 2020, with the approval of the advisory board, we issued an “Ithaca 2030 District Statement on Social Justice and the Built Environment,” calling on the U.S. building sector too address systemic racism and racial injustice and outlining an approach to a sustainable and resilient built environment that benefits all communities. The full statement can be found on our website [here](#).

Ithaca Carbon Neutrality Project

Overview

The Ithaca Carbon Neutrality Project, sponsored by the Systems Engineering Program at Cornell University, has been underway since fall 2019. This report to TCCPI is a brief summary of the work done to date (May 2021). In the next month or two a full report should be available publicly with the details of our results.

sustainability. These ongoing conversations have been incredibly valuable to the ICN team. They are building a better understanding of our stakeholders and how we can help them, as well as letting the ICN team learn from their experience.

- The ICN Policy sub-team reached out to 42 stakeholders in Tompkins County to set up interviews. Of those stakeholders, ICN was able to set up calls with 20 stakeholders and compiled transcripts of the conversations including their answers to questions such as “What are the most popular retrofits you or your customers use?” and “What do you see as some of the biggest barriers to retrofitting?” and others seeking opinions on different incentives and retrofits. Results of these interviews will be spelled out in the main report to be released soon.
- A stakeholder analysis is an essential task, serving as the foundation for the entire project because stakeholder satisfaction is crucial to the project’s success. The analysis, which is described in the full report, gives project participants a quantitative justification for many of the crucial design choices that they will inevitably face, while giving them the ability to prioritize those design choices based on the weight of the stakeholder’s involvement.
- The result of our formal Stakeholder Analysis shows that for any particular type of decision and action, the Administrative Government holds a lot of influence, which grows larger and larger when multiple numbers of stakeholders are involved. This finding shows that leveraging Administrative Government must become a high priority if the project hopes to secure action from anyone else.

Conclusions and Future Work

- Meeting the ambitious goal of achieving community-wide carbon neutrality also means that communities will be transitioning from the presently higher-paying fossil fuel work to green jobs. As such, this transition must ensure employment opportunities with sustainable wages and benefits for working-class communities. Shifting to green work offers the city a large-scale opportunity to meaningfully empower and engage with communities that face barriers to employment. Investing in workforce training through work readiness and apprenticeship programs is vital in this regard. At present, the Tompkins County Industrial Development Agency (IDA) has no policy that requires developers to hire locally and promote Project Labor Agreements that can ensure labor protections and worker representation. Excluding cases in which there is a documented scarcity of local labor, coupling tax exemption policies with those that ensure the prioritization and protection of local green workers, is very important for a just transition to a sustainable economy and should be a high priority for the IDA and Ithaca area communities.
- A comprehensive communication and education campaign will be essential to the successful implementation of Ithaca’s Green New Deal plan. Our stakeholder outreach revealed that many



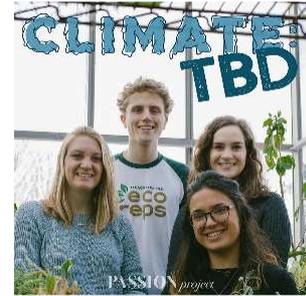
Ithaca residents are confused about the City’s carbon neutrality goals and the necessity of retrofitting to increase energy efficiency in buildings. Deciding on which retrofits to implement can also be overwhelming given the amount of information available. To accomplish the city’s carbon neutrality goals, Ithaca residents need to take action now. An effective communication campaign would help clarify the benefits and incentives of retrofitting

and empower residents to make informed decisions about their homes and businesses.

- In the future, we are planning on working closely with Luis Aguirre-Torres, Sustainability Director for Ithaca, as he works to raise awareness of Ithaca’s Green New Deal plan. Specifically, we plan to contribute to his *1,000 Conversations about Climate Change* campaign. The idea is to record 1,000 people in Ithaca having informal conversations about climate change – the problems it causes and the solutions which are most promising – and then post them on a website. This project will help the city better understand what Ithaca residents think about climate change, where they see the worst impacts of climate change, and what solutions they want. It will also

hopefully bring more awareness to the city's carbon neutrality plans and encourage community participation. Our role in this project may be promoting the campaign and helping to facilitate conversations.

- The economics sub-team of ICN Policy will conduct a tax revenue analysis to find out how much additional tax revenue the city will generate as a result of the implementation of building retrofits. First, the team members will research how much tax revenue is generated per type of retrofit. We can figure out total tax revenue generated for the city per type of retrofit by estimating the quantity of each retrofit type that will be installed. Finally, economics team members will compare their findings to the tax revenue that would be generated by other green building plans (property tax, income tax, etc.).
- Another consideration for the ICN Policy team is to truly expand our work to include what our name describes, carbon neutrality for the City of Ithaca. This goes beyond just existing buildings and includes work on electrifying buildings and the electricity supply from the grid, shifting power sourcing to renewable energy from natural gas, and making transportation more sustainable. We've done some preliminary work on all of these topics, but a deep dive is necessary for Ithaca truly to meet its goal of carbon neutrality by 2030. Retrofitting buildings is not enough; it's only part of the solution. With transportation, we would aim to look into recommending policies that improve the attractiveness of TCAT, EVs, rideshares, and non-car transportation. With electrification, we would consider both how to modify buildings to accept electricity as its source, as well as how to modify Ithaca's energy mix to use more electricity to replace fossil fuels. For renewable energy, we'd look into capacity, economic feasibility, and distribution of energy. This might include distributed energy resources (DERs) such as rooftop solar or other local battery storage as well as larger solar and wind farms.
- The members of the Ithaca Carbon Neutrality Project are looking forward to continuing working together with everyone in the Ithaca area a green, sustainable, and equitable Ithaca.
- See the Appendix for the full interim report to TCCPI.



Ithaca College

Office of Facilities

- 2.9 MW solar farm celebrated its third anniversary and to date has produced 13.6 GWh of electricity for the College and prevented over 9,000 MT of CO₂e emissions.
- Subscribed our College Circle Apartments to the new Lansing community solar farm.
- Completed the final phase of the Center for Natural Sciences lighting upgrade project.

Office of Energy Management & Sustainability

- Announced an expedited carbon neutrality date of 2030, an integral part of the Ithaca Forever comprehensive strategic plan.
- Institutional sponsor for the annual AASHE Global Conference on Sustainability in Higher Education Conference.
- Achieved our 60% carbon neutral goal.
- Attended and presented at the annual AASHE, NYCSHE NYAPPA, and other professional conferences.
- Co-hosted the virtual NYCSHE Conference with Cornell.
- Presented IC's Path to Carbon Neutrality at the Climate Leadership Summit, which included Gina McCarthy as the Conference Keynote.
- Remained actively engaged in the NY Higher Ed Large Scale Renewable (NYHE LSRE) consortium steering committee, a public-private higher-education partnership looking to develop a number of large-scale renewable energy sites to meet our varied environmental commitments.
- Installed additional electricity sub-meters to help further identify usage patterns.
- Continued operating two, dual port EV charging stations on campus that are free and open to the public – they have provided over 32 MWh since they were installed.

- Continued the Eco Reps and OEMS Intern programs, hiring 12 engaged students throughout the year.
- Utilized Staples funding to support sustainability internship positions and special events within the School of Business and Environmental Studies.
- Hosted the third annual Sustainability Luncheon for the campus community called the Ugly Food Challenge, in which chefs competed to make the most delicious dish out of food waste. The event was a competition and partnership among IC Sustainability, Dining, Civic Engagement, AmeriCorps VISTA, Cornell Dining, and Maines Foods.
- Provided institutional support and actively engaged with NYAPPA, NYCSHE, Second Nature, AASHE, Green Building Council, Get Your Green Back, PLAN, EPA Green Power Partner, REV Campus Challenge, We Are Still In, NACUBO, Building Bridges, CCE Tompkins Environment Program, and the Environic Foundation.



Engagement

- Eco Reps continued to act as peer-to-peer educators by engaging student, faculty, and staff in campus-wide sustainability dialogue.
- Continued the Ithaca College Natural Lands (ICNL) Sequestration Research, a joint faculty and student research project.
- Completed the Started the Climate Action Plan Group, one of many engaged Strategic Planning Teams.
- Started a student, faculty, and staff research project to more fully identify and quantify our complete Dining System carbon footprint.
- Continued Cupanion's "Fill It Forward" program, a nation-wide campaign to eliminate single-use plastic bottles. To date, IC has diverted nearly 15,000 plastic water bottles.
- Chestnut Living Lab: Added new point-of-use water meters for the apartments. Student research is capturing and comparing results from a sustainably designed apartment compared to the traditional apartment. Presented preliminary findings to Senior Leadership Team in spring 2020. Student research continues and is working to estimate financial savings due to water and electricity upgrades.
- Participated in virtual Accepted Student and Orientation events.
- Eco Reps continued supporting composting throughout campus and into apartments.
- Actively promoted the NWF EcoCareers Conference which prepares students and young professionals for wildlife and sustainability careers by providing information on the latest EcoCareer trends from leading analysts and employers.
- Developed and presented content for the Ithaca College Seminar Series (ICSM) lectures, Choices for a Sustainable Future.
- Supported the on-campus Food Pantry.
- Continued the successful South Hill Forest Products, a student-run business dedicated to providing high quality, all-natural, non-timber forest products to the community, using the natural resources within the Ithaca College Natural Lands.
- Partnered with the School of Business for the virtual Earth Day Foundation event in partnership with the School of Business and IC Impact
- Presented monthly Student Leadership Initiative (SLI) discussions geared at engaging students in a new sustainability dialogue surrounding the monthly themes: Waste, Transportation, Water, Food, Energy, Health, Social Justice, Business, and Climate Change. A number of these were led by student presenters this year.
- Developed content and presented as virtual guest-lecturer(s) for several courses.



- Hosted monthly events to engage students in sustainability dialogue surrounding monthly themes.
- Eco Reps started Instagram and YouTube channel, promoting sustainable lifestyle choices and educational content.
- Increased circulation and improved monthly “Installments,” a quick read posted in campus restrooms that highlight global sustainability issues.
- Expanded campus composting that now includes College Circle Apartments, Emerson, Terrace, and Garden Apartments.
- Summer intern studied the potential for a Zero Waste Plan as part of the Post Landfill Action Network membership.
- Provided “sustainability at home” webisode in partnership with IC Case Management.
- Virtually engaged with the New Roots Charter School, focused on career development and post high school opportunities.
- Developed virtual Campus to Community content, a series aimed at improving campus and community relationships, in partnership with Building Bridges, Cornell Cooperative Extension of Tompkins County, and Sustainable Tompkins.
- Presented to TC Environmental Management Council about environmental justice in the United States.
- Co-organized and co-hosted the Tompkins County virtual Earth Day Celebration.
- Co-organized and co-developed the county-wide “Room to Breathe” story telling project.
- Sponsored Planet Forward’s annual Story Fest conference. President Shirley Collado delivered the conference keynote address.



Transportation

- Utilized an electric and solar vehicle, informally known as the Eco Mobile and Eco Bug, for major public events and general, everyday use by students and staff, now approaching 1,100 miles.
- Improved accessibility of Ithaca College Natural Lands by building turnpike-style paths, reducing rainwater run-off, and improving the interconnectivity to other paths and trails.

Dining Services

- Supported the student organization Stop Wasting Ithaca’s Food Today (SWIFT), which packages surplus meals for donation to the Rescue Mission.
- Increased our local sourcing in partnership with Cornell University Dining and other food suppliers.
- Continued the reusable mug discount at coffee shops from 15 cents to 25 cents.
- Continued our back-of-house composting program.
- Celebrated the 26th anniversary of our composting program.
- Introduced an expanded reusable takeout program, which is currently used at all campus dining halls due to COVID-19.



Ithaca-Tompkins County Transportation Council

Like most other agencies the Ithaca-Tompkins County Transportation Council (ITCTC) had to adjust its work program in 2020 to address pandemic conditions and needs. All our meetings moved to a remote format. We continued to have strong participation from partners and our obligations managing surface transportation funding were met without interruption.

Specific activities during 2020 included:

- Organized weekly meetings of transportation, planning, and community health representatives to address COVID transportation challenges. As a group, we developed programs to transport persons to COVID test sites and later to vaccination sites. TCAT and Gadabout offered free rides; CCE Way2Go helped with outreach; 2-1-1 served as point of contact and information; Tompkins County facilitated financing with emergency funds. ITCTC contacted Ourbus (inter-city bus company) and, with their assistance, negotiated subsidized rides to the SUNY Binghamton state vaccination site. More limited service was also available to the Syracuse state vaccination site. The inter-city bus service was brokered by GetThere, a community mobility program serving the Southern Tier. This was a great example of collaborative effort in support of our community.
- Worked with Bike Walk Tompkins to explore bikeshare service options for the City of Ithaca. Micromobility (shared bike, scooter, etc.) continues to be a quickly evolving sector. We produced an RFI and received several notices of interest. None of the respondents could provide a turn-key solution that would result in service to Ithaca in 2021. The group continues to investigate service options and possible business models, with an eye for spring 2021 implementation.
- The ITCTC published an updated version of its popular Ithaca and Tompkins County Bicycle Map. The map is available online [here](#). Paper copies, including bundles for distribution, can be obtained by contacting the ITCTC at 607-274-5570 or itctc@tompkins-co.org. The map is free of charge.

Local First Ithaca

- Produced our 10th Annual Guide to Being Local in 2020.
- Completely revamped our website.
- Partnered with the City of Ithaca, Tompkins County Chamber of Commerce, and Downtown Ithaca Alliance to craft the [Ithaca Promise](#), which ensures Ithaca workers wear masks when serving customers, practice cleaning and disinfecting, manage the density of people inside buildings, and businesses monitor the health of their employees.
- Campaigned throughout the year to encourage community members to support local businesses during the COVID-19 crisis.
- Continued our work with the Ithaca 2030 District Advisory Board and Tompkins County Climate Protection Initiative Steering Committee.

New Roots Charter School

New Roots is a small public high school with a big mission located in the heart of downtown Ithaca. Open to any student eligible for high school in the wider region, the tuition-free college and life preparatory program engages students in learning actively, thinking critically, and solving real world problems creatively and collaboratively, developing the knowledge and skills to turn 21st century challenges into opportunities. New Roots features a unique four-year learning sequence that fully integrates Education for Sustainability (EFS) standards and interdisciplinary, community-based projects featuring sustainability themes while meeting all New York State graduation requirements. The lower school program (grade 9-



10) cultivates foundational understandings and skills that prepare students to become actively involved in their school and local community as leaders, entrepreneurs, and activists when they move into the upper school program (grades 11-12).

The State Education Department has honored New Roots Charter School as a New York State Green Ribbon School, one of only three state nominees for the U.S. Department of Education's Green Ribbon Schools (ED-GRS) program distinction.

The Green Ribbon award recognizes schools that reduce

environmental impact and costs; improve the health and wellness of schools, students, and staff; and provide effective environmental and sustainability education.

“The Green Ribbon Program sets the gold standard,” said New Roots Founder and Principal, Tina Nilsen-Hodges. “We are so honored to be recognized among schools committed to the highest ideals for these essential elements of a 21st century education.”

Authorized as a tuition-free public school by the State University of New York in 2008, New Roots attracts a regionally diverse population of students in grades 9-12, bringing together young people from rural, urban, and suburban backgrounds in a learning environment that integrates core environmental, sustainability, green technology, and civics studies into a four-year college preparatory curriculum emphasizing STEM through community-based, interdisciplinary projects.

“To be honored here in New York and nominated for this prestigious national award is truly an outstanding achievement and I congratulate staff, students, and school board for their commitment to creating sustainable and healthy school communities,” New York Education Commissioner Betty Rosa said. “It’s inspiring these students are committed to creating a cleaner, greener environment and they are positioned to be our future environmental and clean energy leaders.”

The Green Ribbon Schools recognition award is given to schools that have demonstrated high achievement in all three ED-GRS Pillars:

1. Reduce environmental impact and costs;
2. Improve the health and wellness of schools, students, and staff; and
3. Provide effective environmental and sustainability education.

New Roots students engage in interdisciplinary studies of core academic subjects within a framework of sustainability and environmental stewardship, focusing on college, career, and life readiness.

The school’s student-initiated Cayuga Wetlands Restoration Project, inspired by the ecological wisdom of the Cayuga Nation, integrates scientific knowledge with civic engagement. The NY Department of Environmental Conservation awarded New Roots a four-year grant of \$38,000 to establish the Summer Youth Ecological Restoration Corps to further the project, designed to study how native wetland species contribute to the health of the lake ecosystem.



“The Board and I commend the students, educators and staff in these schools for their commitment to improving their communities and working to build a cleaner, safer environment for all,” Board of Regents Chancellor Lester W. Young, Jr. said. “Recent natural disasters have shown that environmental responsibility is imperative for our planet and our next generation. These schools are not only setting an example for their students, but they are also setting an example for their community and schools across the state.”

The ED-GRS program recognizes schools where staff, students, officials, and communities have worked together to produce energy efficient, sustainable, and healthy school environments and to ensure the environmental literacy of graduates. The recognition award is part of a larger USDE effort to identify and disseminate knowledge about practices proven to result in improved student engagement, academic achievement, graduation rates, and workforce preparedness, as well as a government-wide goal to increase energy independence and economic security.

Honorees of the U.S. Department of Education Green Ribbon Schools competition will be announced in a ceremony held in Washington DC this fall.

Park Foundation

- The Environment Program disbursed 31 grants that had a climate and energy focus totaling \$1,615,000.
- The Sustainable Ithaca Program disbursed \$190,000 in climate-related grants in 2019.
- The Foundation filed five shareholder resolutions seeking reports on carbon asset risk (Anadarko, Chevron), net-zero greenhouse gas emissions (Amazon, Cooper) and climate-related water risk (Energen).

Paleontological Research Institution, Museum of the Earth, and Cayuga Nature Center

- In 2020, we opened a new, permanent exhibit on climate change and energy at the Museum of the Earth: the *Warren D. Allmon Changing Climate: Our Future, Our Choice* exhibit. We also launched an [online version of the exhibit](#).



- Together with teams from Cornell, Clarkson University, and SUNY ESF, we began developing a climate change training course for employees of the New York Power Authority and the New York Canal Corporation. This training is mandatory for all employees.
- We organized a series of seasonal Social Distance BioBlitzes for the Cayuga Lake Basin. Participants could join in from wherever they were and collect observations using iNaturalist. This activity helps establish a record of biodiversity in our region as the climate is changing.
- We developed a series of YouTube videos on topics in climate science called [In the Greenhouse: Exploring Climate Change](#), as well as a video series on [tree phenology](#).
- We conducted sessions on climate change education at national and regional conferences such as annual conferences of the Geological Society of America. We also conducted online teacher professional development workshops on climate and energy literacy.
- We continue to develop and run climate change education programs for students and the public, though many of them have been online in the past year.

Sciencenter

- 220 students from Tompkins County (and 165 from Cayuga County) participated in free virtual field trips in 2020. Students worked on engineering challenges to develop waterwheels and/or wind-powered vehicles while exploring renewable energy and climate change.
- Children and their families designed, built, and tested model waterwheels through a partnership with Newfield Public Library. This engineering challenge connected families to Newfield's rich history and to future uses of alternative energy.
- The Sciencenter has been the host site for the PowerHouse. This portable structure has a goal to increase energy literacy and educate residents on ways to reduce energy use. The PowerHouse is a project of Get Your GreenBack Tompkins, an independent program of Cornell Cooperative Extension of Tompkins County.

Sunrise Movement Ithaca

National Campaigns & Actions

- Hosted 2020 Launch Parties showing two GND-focused documentaries and released our plan to win elections and secure a national Green New Deal:
 - [Generation Green New Deal](#)
 - [Our Plan to Win](#)



- Organized Strike Circles to expand our reach and foundational grassroots organizing knowledge leading up to the 2020 Climate Strike.
- Participated in nationwide phone-banking for Green New Deal champions in the House and Senate.
- Participated in nationwide phone-banking promoting [The People's Bailout](#), a robust response to the novel coronavirus pandemic that puts people ahead of corporations.
- Participated in nationwide phone-banking to elect Joe Biden as President of the United States.
- Joined a regional mentoring and peer-coaching program in partnership with other Sunrise hubs in the Northeast.
- Participated in phone-banking that registered young Georgians to vote in the state run-offs.

Local Campaigns & Actions



- Continued to work on hub restructuring that prioritizes horizontal organization and shared leadership.
- Organized and hosted a NY 125 candidates' forum and subsequently endorsed Anna Kelles for State Assembly.
- Hosted a friendly street art competition between Extinction Rebellion Ithaca and Sunrise Ithaca.
- Hosted a South Hill Rec Trail mural competition focused on environmental justice in partnership with Ithaca Murals and the Ithaca College Eco Reps.
 - See Nina Widger's winning submission and final mural [here](#).
- Supported and partially funded the "Sunrise on the Green New Deal" mural on Fulton Street in downtown Ithaca.
- Presented at the 2020 Tompkins County Earth Day celebration.
- Developed an anti-racism framework and subsequently hosted anti-racism workshops, book readings, and discussions.
- Participated in a four-day defund the police/abolitionist workshop.



- Organized and hosted Sunrise Action Week, a week-long deep-dive into goal setting, planning, and team building for the tail-end of 2020. Watch our promo video [here](#). Focus groups included:
 - Remove Trump from Office
 - Ithaca Green New Deal
 - Building Partnerships
 - Defund the Ithaca Police Department
- Joined the Tompkins County Anti-Racism Coalition.
- Organized and hosted Fridays for Future “chalk-out” at Ithaca City Hall.
- Hosted and participated in multiple virtual open mic nights.
- Spoke at the Ithaca “Rally to Protect the Results & Build a Better Democracy” in response to the mounting threat of a coup. See Sunriser Ruby’s comments [here](#).
- Organized a photo campaign in support of implementing the Ithaca Green New Deal.
- Presented at the League of Women Voters of Tompkins County event, “The Climate Crisis is Serious... Are We?” that attracted over a hundred people.
- Began mobilizing in support of a stronger Ithaca Green Building Policy.
 - Find our demands [here](#).
- Continued to develop a robust, progressive policy package in collaboration with Common Council and the Painters & Allied Trades union.



Sustainable Tompkins

- We are proud of the results from a very challenging year for our Finger Lakes Climate Fund (FLCF). By March, carbon offsetting had dropped off to nearly zero as air travel came to a halt. This drop in donations came just as we were awarding FLCF grants faster than ever. We immediately went to work running multiple campaigns to spur additional offsets. Thanks to this team effort, we almost reached our goal (\$40,000) and secured \$39,507 from 277 gifts despite the economic crisis and shutdown.
- Good thing we did because we awarded \$40,058 in 24 FLCF grants in 2020, keeping 2,800 tons CO2 out of the atmosphere. We combined our grants with \$44,700 in heat pump incentives for low-income residents and then awarded another \$21,200 for 12 additional heat pumps from our NYSERDA grant. It was a big year of work and results for us, reaching \$102,268 in carbon offset grants to 62 lower-income households. That’s a total of \$183,068 in funding support for those in need to make their homes low carbon, comfortable, and affordable. We hope to match this success in 2021 via partnerships across the region to raise another \$40,000 and make at least 20 awards.
- In addition, our Neighborhoods Mini-Grant Program awarded seven grants totaling \$4,300 in 2020 to local organizations for such items as supplies for urban farming education, native trees and planting materials for a community tree planting at Lighthouse Point, a solar pump for a new pond at Groundswell’s incubator farm, and a bike rack at the Village at Ithaca.



- In May, Sustainable Tompkins co-sponsored with the NY League of Conservation Voters a forum on Zoom about how the seven candidates running for the 125th seat in the General Assembly will address regional sustainability issues, including climate justice.
- Two members of our team, Marisa Lansing and Jessica Swindon, joined over 20 presenters and performers on Earth Day 2020 in April as part of a local virtual celebration organized by Building Bridges, South Side Community Center, Sunrise Ithaca, and Get Your GreenBack Tompkins.
- We released a new 10-minute video in February on the mission and work of the Finger Lakes Climate Fund.
- The addition of Clean Energy intern Maggie Mowrer to the team in June took our work to a much higher level of impact. She's a graphic design/marketing graduate of Ithaca College and her illustrations for our zoom presentations, Instagram/Facebook, and brochures have deepened our appeal to both donors and the public. She's been fast and fearless in helping to develop new online tools like My Green FLX (our augmented reality app), SustainFlx.caard.co (digital portal to all our work), and using NYSERDA tools to run massive Facebook ads. Maggie has worked closely with Marisa Lansing, our FLCF coordinator, to run multiple online campaigns that demonstrate value to our business sponsors.
- In December, we won an additional grant from the Park Foundation to build a new FLCF website that will be more interactive and dynamic.

Taitem Engineering

Taitem's Energy + Sustainability and Quality Assurance departments continue to provide a broad range of services through the New York State Energy Research and Development Authority (NYSERDA). Our projects are located throughout New York. Local highlights include:

- Regional Stretch Code training for municipal code officials under NYSERDA's Innovative Energy Efficiency and Clean Energy Market Development Programs, with the goal of increasing construction for zero-energy commercial, multifamily, and single-family buildings.
- Energy studies for small businesses and not-for-profits through the Green Jobs/Green NY program: EAC Montessori School, Brooktondale Community Center, West Danby Fire Department.
- On-site energy management for Ithaca Neighborhood Housing Services.
- Completed analysis for HeatSmart Tompkins, which evaluated the effectiveness of installing heat pumps plus envelope improvements. Post-retrofit analysis showed significant reductions in site EUI and GHG emissions.
- Energy consulting for new buildings through NYSERDA's New Construction Programs: Stonebend Farm in Newfield; Salt Point Brewing in Lansing; and multifamily projects underway in Ithaca, including Ithaca Arthaus, the planned Asteri Ithaca; and 430-444 West MLK/State Street buildings.
- Projects through Tompkins Business Energy Advisors include assessments of energy-saving options for the planned Cass Park ice rink enclosure, the Aeroplane Factory expansion, Fingerlakes Shaolin-Do, and others.



Taitem continues its consulting role in Avangrid's NYSEG's Energy Smart Community, providing support to initiatives that promote electrification and modernizing New York's electric grid, including the transition to electric vehicles.

Taitem's Design Department continues its work on new buildings and renovations/energy retrofits, often being able to provide integrated design and energy consulting services. Local buildings of note include:

- The highly energy efficient GreenStar Cooperative Market
- Ithaca Arthaus, a mid-rise wood-framed multifamily building
- Renovations at the Ulysses Town Hall and Ulysses Philomathic Library

Tier Energy Network

The Tier Energy Network (TEN) is a regional network of industry, government, community, and higher education members supporting the development of an energy strategy for New York State's Southern Tier. The Tier Energy Network was founded through the efforts of local business leaders in 2014 and currently has over 200 members and participants. TEN's intent is to develop and promote the Southern Tier of NY for clean energy business growth, creation of clean energy jobs, energy conservation and efficiency adaptation, development and adoption of renewable and energy storage technology and services, and fostering a venture capital friendly environment for energy innovators.



Despite the effects of the COVID-19 pandemic, 2020 and 2021 have been busy times for TEN. TEN was awarded a grant from the Appalachian Regional Commission (ARC) through the Southern Tier East and Southern Tier Central Regional Planning Boards to map the clean energy industry cluster in 11 counties in the Southern Tier of New York. The project consisted of identifying, large-scale clean energy projects, solar PV projects larger than 25 kW, energy storage projects, custom manufactures, EV care dealers, university research centers and projects, air source and ground source heat pump installers, and engineering firms.

Included as part of the project were interviews with startup companies, county IDAs, utilities, NYISO and NYSEERDA, and project managers to determine projections of employer needs for workers, barriers to the development of projects, utilization of clean energy technologies, the potential influence of the Climate Leadership and Community Protection Act (CLCPA), entrepreneurial support for rural areas, the need for energy analysis for business, economic developers, and the general public, and the effect of COVID-19 on the economic recovery in the Southern Tier. The results of the mapping project will be released by the ARC in 2021.

The TEN Workforce Development Committee has been busy with following the state forecasts for clean energy workers and what training will be required by each sector in the clean energy ecosystem. The WFD Committee seeks to identify best practices for workforce development and hiring, analyze the segmentation of the workforce and the training or educational needs for each segment, develop a workforce strategy for the implementation of air source and ground source heat pumps, look for resources for the oversight committee, and find good experiential education opportunities for interns and apprentices. TEN will support the Talent Taskforce, the Regional STEM Initiative, the A,M&T grant on clean energy technology manufacturing, the SUNY Broome Mechatronics program, the development of a STEM center in Waverly, and will seek to support a grant to train hard to place populations for energy service jobs.



TEN has continued with its Energy Speakers Series and had several start up and industry speakers in 2020 including:

- Matt Gill, Founder and CEO of Enhanced VR
- Kyle Nedlik from ASHRAE
- John Hroncich, Regional Sales Manager, Power and Propulsion Solutions, BAE Systems

- Dr. Carol Rabke, Senior Portfolio Manager at Dawnbreakers
- Dustin Broderick, Sr. Program Manager at Franklin Energy
- Gareth Brown, CEO of Clir Renewables Inc.
- Michael Oshetski, CEO of Micatu
- John Ciavocco, President of Aztech Geothermal, LLC
- Aiden Livingston, CEO of ThermoAI
- Brenda Grober, Senior Director of Industry Development, Empire State Development's Strategic Business Development Division
- Jerone Gagliano, CEO and Founder of Bright Building
- Inbal Nachman, Director of Marketing and Public Relations at SkyVen Technologies
- Andrew Hosier, AVANGRID Energy Specialist, Customer Programs and Products, EV Make Ready Initiative

The Tier Energy Network has begun a Technology Roadmap Committee to study the CLCPA and its effects on the technologies to be implemented to reach the goals of the CLCPA. Outreach will be made to municipalities, commercial and industrial organizations, and institutions to provide support for the implementation of clean energy technologies.

TEN Goals for 2021 include:

- Mentor and attract clean energy technology companies.
- Form an industry association to promote the region, remove barriers to growth and improve business processes.
- Develop a Technology Road Map.
- Establish a clean energy technology event for fall 2021.
- Complete a clean energy technology workforce development plan for the Southern Tier including a project for Career Pathways.
- Maintain the mapping system and continue collaboration.
- Support an industry summit on advanced manufacturing.

TEN looks to collaborate with any professional group who seeks to develop a clean energy technology industry cluster to drive economic and workforce development in the Southern Tier. All TEN meetings are free and open. Please email Mike@CleanEnergyTechnologyResources.com with any inquiries.

Tompkins Community Action

Tompkins Community Action, Inc. has been the designated U.S. Department of Energy/NYS Homes and Community Renewal Weatherization Assistance Program (WAP) provider for Tompkins County for thirty-seven years. Working closely with the New York State Energy Research and Development Agency (NYSERDA) as a Home Performance with Energy Star contractor; we provided Assisted Home Performance and EmPower NY Programs.



As a Building Performance Institute (BPI) Goldstar Contractor, members of TCAction's Energy Services Department held multiple BPI Certifications including Auditor, Heating Professional, Envelope Professional, Manufactured Home Professional, Building Analyst and Quality Control Inspector. We partnered with numerous municipal entities, not for profits, and private sector organizations to leverage funding associated with weatherization, energy efficiency, and other types of home repair and housing rehabilitation programs.

We carried out the following projects in 2020-2021:

- 23 jobs completed through the Weatherization Assistance Program.
- 13 HP (heating & shell measures) jobs completed through the EmPower NY Program.
- 5 ER (electric reduction only) jobs completed through the EmPower NY Program.
- 10 households received heating equipment repairs or replacements (HERR) through the HEAP/HERR benefit.
- 19 households received clean & tune services through the HEAP Clean & Tune benefit.
- 6 Assisted Home Performance (AHP) energy audits were completed.

Due to many years of losing monies in our efforts with the NYS Weatherization Assistance Program and the recent inability to hire staff, TCAAction chose not to engage with the NYSHCR contract for the Weatherization Assistance Program in 2021 and our services in the Weatherization Assistance Program have ended. There is, however, still a program serving Tompkins County; Cortland County Community Action (CAPCO) will serve Tompkins households. Please give Linda Nash a call at 607-273-8816 for information on how to access CAPCO services in Tompkins County.

Tompkins Community Action's Energy Programming has ended, and we will concentrate our efforts on maintaining our Energy Efficient Supportive Housing Residences and Head Start Centers, and continue to make remarkable progress in Housing, Food programs, and Early Childhood Education.

We wish to thank our dedicated energy staff members throughout the years and thank CAPCO for taking on Tompkins County as part of their Energy Services commitment in NYS.

Tompkins County

- *Business Energy Advisors New Construction Program* – This program is designed to assist businesses/organizations in making energy decisions for new construction, renovations, and expansion projects. Since its launch in 2018, the program has participated in 37 introductory meetings, produced 31 energy options reports, and participated in 31 energy charrettes, which have led to at least ten businesses applying to financing programs offering more assistance to implement energy efficiency measures in their buildings. In 2020, almost every project suffered major delays or were put on hold due to the COVID-19 pandemic. Thus far, three participating building projects have obtained their building permits and are under construction. Participating business sectors have included manufacturing, retail, multifamily, R&D (technology), non-profit, and government.
- 
- *Business Energy Advisors (BEA) Lansing for Existing Buildings* – This was a one-year pilot program designed to assist existing commercial and industrial facilities over 10,000 square feet in size, located within the Lansing natural gas moratorium area. It was established from a NYSERDA grant received by Solar Tompkins, Inc. Solar Tompkins contracted with TCAD to provide support for BEA Lansing for Existing Buildings which, in turn, hired Tompkins County to manage the program as a sister program for the current BEA New Construction. Up to \$80,000 in funding was available to hire energy consultants to work with businesses participating in the BEA Lansing for Existing Buildings program. In July 2020, program guidelines were amended to allow buildings with as little as 3,000 square feet of gross floor area to participate. In 2020, introductory meetings were held for eleven projects, produced eight energy options reports, and participated in eight energy charrettes. Thus far no businesses have applied for financing programs or have obtained their building permits and are under construction.
 - *Climate and Sustainable Energy Advisory Board* – This new advisory board began meeting in March 2020. Accomplishments included making or advocating for comments on the NYSEG rate case and Office of Renewable Energy Siting regulations; providing feedback on the County Greenhouse Gas Emissions Inventory; supporting the proposal for new Chief Sustainability

Officer staff position; working on the green jobs report that led to the addition of a labor position on the Tompkins County Industrial Development Agency (IDA); supporting Legislators' input into the CLCPA and CAC advisory panels.

- *Greenhouse Gas Emissions Inventory* – Completed the Tompkins County Greenhouse Gas Emissions and Energy Use inventories for both the community and county government operations. (Presentation to the County Legislature in early 2021.)
- *Resiliency and Disaster Recovery Plan* – Selected consultant to utilize NYS Department of State and FEMA funds to develop a plan to reduce risk associated with hazards in the changing climate and prepare the community to take the actions necessary, including those that build economic resilience, to bounce back from a disaster should it occur. The first component of the plan, the update of the hazard mitigation plan, was largely drafted throughout 2020. Each of the other plan components will be drafted in 2022.
- *County Government Electric Vehicle Fleet* – Staff worked with a consultant to develop the Tompkins County Fleet Review and Analysis Report as well as the Tompkins County Fleet Management Framework. Both reports will help guide the County as it works to develop a program to green the County fleet. In addition, staff supported the installation of telematics devices in 23 electric and hybrid County vehicles that will collect vehicle data to inform future fleet-related decisions, while also serving as a pilot to evaluate the installation of telematics in the rest of the County fleet.
- *County Government Facilities* – Staff supported an application to the NYSERDA Flexible Technical Assistance (FlexTech) Program to obtain site-specific targeted technical assistance and analysis of County-owned facilities in 2021 that will help inform future investments to help move the County towards its net zero emissions goal.
- *Real Time Energy Management (RTEM)* – Staff supported the installation of the hardware at the Department of Emergency Response and the Health Department buildings which will continuously monitor and pull current and historical performance data into one location through a cloud-based system that will help identify inefficiencies and strategically plan capital improvements while understanding energy consumption on a granular level and diagnosing equipment issues in real time. This effort is funded by NYSERDA and a County cost share.

Tompkins County Climate Protection Initiative

- The Ithaca 2030 District remained the flagship program of TCCPI in 2020. Fifty percent of the coordinator's hours are committed to this project. The 2030 District is vital to achieving two important strategic goals for TCCPI: 1) strengthening the involvement of the business community in efforts to reduce the community's carbon footprint; and 2) establishing a process for collecting building performance data in downtown Ithaca and benchmarking it against both national and local baselines. For more details, see the Ithaca 2030 District report above.
- The TCCPI monthly general meetings continued to be very well attended, with an average of about 25 participants. That the meetings continue to attract a sizeable number of community leaders and activists after over twelve years, together with the high number of requests made to present at the meetings (most of the agenda topics come about this way) and the fact that the agendas for the meetings are usually set several months in advance, suggest interest in TCCPI remains strong.
- Topics in 2020 included:
 - Carbon Offsets and Standards – Stefan Jirka, Sustainable Landscapes Manager with Verra
 - The Sunrise Movement Ithaca Campaign – Marisa Lansing and Rebecca Evans, Co-Founders of Sunrise Movement Ithaca
 - The Rollback of EPA Regulations – Rebecca Newberry, Executive Director of the Clean Air Coalition of Western New York



- Community Choice Aggregation: A Path to Energy Independence – Irene Weiser, Coordinator of Fossil Free Tompkins
 - Growing Our Climate Resilience at EcoVillage – Nathan Scott, Executive Director of Thrive Ithaca EcoVillage Education Center
 - The Ithaca Green New Deal and the Climate Crisis – Anne Rhodes, Community Activist; and Kirby Edmond, Program Director and Senior Fellow at the Dorothy Cotton Institute
 - Climate Justice Organizing at PUSH Buffalo – Kelly Camacho, Climate Justice Organizer for PUSH Buffalo
 - Go Ithaca and Transportation Demand Management – Lauren Gabuzzi, Program Manager at Downtown Ithaca Alliance
 - Green Workforce Development Panel Discussion – Aloja Airewele, coordinator of Energy Warriors; Brian Eden, Chair of HeatSmart Tompkins; Ellie Pfeffer, Member of Sunrise Ithaca and the Tompkins County Climate and Sustainable Energy Advisory Board; Karim Beers, Coordinator of Get Your Greenback Tompkins; and Natalie Branosky, Director of Workforce Development Board of Tompkins County
 - CCA 3.0: Community Choice Aggregation for Climate Mobilization – Paul Fenn, President of Local Power LLC (Massachusetts/California); and Julia Peters, Co-Founder, Administrator, and Strategist for the Massachusetts-based Local Power
 - The Public Service Commission Gas Planning Proceeding and NYS Climate Policies – Lisa Marshall, Program Director of HeatSmart Tompkins and Member of Mothers Out Front
 - The Biden Climate Agenda: What’s Ahead – Tom Shevory, Professor of Politics at Ithaca College and Co-Director of the Finger Lakes Environmental Film Festival
- The [TCCPI Newsletter](#), which comes out every two months, had a subscriber base during this grant period of about 430 and the average open rate during 2020 was 37% for its six issues – both metrics were about the same in 2019. The combined TCCPI/Ithaca 2030 District subscriber base was about 490; there is significant overlap among the two groups of subscribers. In March 2020 the high open rate for the two newsletters again earned the TCCPI Newsletter a “Constant Contact All Star Award,” which the company presents to only 10% of its users; it marked the eighth year in a row that our newsletter has been recognized in this way.
 - The TCCPI [website](#), which continues to be a rich resource on climate change and clean energy issues, was updated on a monthly basis. All of the meeting notes, annual reports, and newsletters can be found archived on the site, dating back to 2009. The website attracted, on average, monthly hits of about 2,300 in 2020.
 - On the social media front, regular postings were made on TCCPI’s Facebook page, including articles from the TCCPI Newsletter, and we increased our “likes” from 406 to 454 during the year. Currently, we have 560 followers. In addition, the TCCPI coordinator continued several times a week to post information about energy, climate change, and sustainability issues on Twitter, and has over 2,400 followers.
 - Efforts to get the word out about TCCPI’s work included talks at the Cornell Institute for Public Affairs and with Energy Navigators as well as participation in the Tompkins County Virtual Earth Day in April 2020.
 - The TCCPI coordinator served on the City of Ithaca’s Green New Deal interim advisory committee, providing input into the City’s efforts towards carbon neutrality by 2030, and the steering committee of Get Your GreenBack (GYGB). Articles on GYGB appeared in each issue of the TCCPI Newsletter as part of this latter collaboration.
 - The coordinator was also on the boards of the Groundswell Center for Local Food and Farming, New Roots Charter School, PRI/Museum of the Earth/Cayuga Nature Center, and EcoVillage at Ithaca, Inc, and he was a regular attendant at meetings of the Tompkins County Council of



Governments Energy Committee and the Tompkins County Climate and Sustainable Energy Advisory Board.

Tompkins County Council of Governments Energy Committee



For 2020, the Tompkins County Council of Governments Energy Committee decided to focus on Community Choice Aggregation (CCA). The committee offered numerous educational webinars and discussions throughout the year working with Terry Carroll from the Cornell Cooperative Extension – Tompkins County and Irene Weiser from Fossil Free Tompkins. In addition to committee members many of the webinars were attended by community members who had previously been involved with CCA explorations. The webinars were recorded and may be found here: <https://southern-tier-ccc.org/webinars-cca>. In addition, Terry offered to make presentations to municipal boards about CCA and his offer was taken up by a number of municipalities.

Toward the end of the year, we reached out to municipalities to gauge interest in moving forward. The feedback received highlighted a definite interest with a focus on renewable energy and energy cost savings. The stated goal is to move forward in a way that aggregates benefits and alleviates the pressure of each municipality to work out details on their own. Furthermore, there is a desire to outline a path that starts with CCA 2.0 and moves toward CCA 3.0.

Tompkins County Environmental Management Council

Outreach & Communications Committee

In October 2020, the committee hosted a virtual panel focusing on environmental justice and the disproportionate impact pollution and its detrimental effects have on low-income communities and communities of color. Richard Rivera from Opportunities, Alternatives, and Resources of Tompkins County started off the evening's discussion by sharing his on-the-ground perspective and experiences working with displaced individuals living in the local homeless encampment commonly known as "The Jungle." Rebecca Evans, campus sustainability coordinator at Ithaca College, and community activist Anne Rhodes rounded out the conversation, speaking to the history of environmental justice and how its dynamics continue to play out beyond our local borders, especially as a public health issue, in communities everywhere. A recording of the evening can be viewed on the County's YouTube channel here: http://https://youtu.be/3w1LA_jTjms.



In 2020, the committee began to pilot a way to keep a finger on the pulse of various environmental groups in our community with the creation of an EMC email that would include information from multiple newsletters and listserv messages.

Bi-weekly this repository email is reviewed to highlight pertinent news and events. In addition, numerous Facebook pages and websites are reviewed for other items or events of import. Roughly 50 groups are tracked throughout Tompkins County, and the NYS Department of Environmental Conservation (DEC) Environmental Notice Bulletin is also reviewed. Sent to all EMC members and anyone else with interest, the Community Roundup has been useful for EMC members to have a better idea of environmental news and events in Tompkins County. While not exhaustive, the calendar of events provides a helpful snapshot of happenings of interest around town.

Unique Natural Areas

The committee did not meet in person or on Zoom in 2020. We did email about the following issues:

- An annual review of parcels subject to foreclosure to determine the existence and significance of natural, cultural, and historic resources on the property, any significant concerns regarding zoning and local/regional strategic land use plans, and any significant economic or fiscal impacts. There were eight parcels on this year's list of foreclosure parcels that include or border on Unique Natural Areas (UNAs). The committee had no significant concerns. The 20-acre property at 1920 Slaterville Road in the Town of Dryden, the former Crispell's property, has been bought and is being renovated by Incodema. The boundary includes a stream and UNA-157 Cooks Corners Gully. No future development encroaching the UNA is anticipated.
- The committee also considered the Dryden Lake Dam removal proposed by NYSDEC. The DEC is considering the removal of the dam and the elimination of Dryden Lake in the form it has existed for over 200 years. We agreed with the recommendation by the Town of Dryden Conservation Board that the Dryden Town Board take all necessary action to ensure the preservation of a dam and the body of water known as Dryden Lake, maintaining its current contribution to the recreational and ecological benefits provided to the Dryden community.

Climate Adaptation Committee

The committee worked on three main activities in 2020:

- Distributing a Rain Garden Brochure: The Rain Garden brochure, completed in 2019, informs residents about how their actions affect flooding, wildlife habitat, and lake water quality. Despite the closures due to the COVID-19 pandemic, the committee distributed nearly 600 brochures to various sites in the county.
- Generating a Flood Preparation Brochure: In anticipation of flooding, residents can take meaningful actions to assess, properly store, and properly dispose of toxic household waste. The committee developed a brochure that addresses risk in flood prone parts of one's house or garage and advises how to take action.
- Providing Input on the 2021 Tompkins County Hazard Mitigation Plan: The committee met with Scott Doyle, associate planner, coordinating the county's update, to discuss how best we could assist in bringing community input into this plan.



Zero Waste Committee

The committee's activity was somewhat hampered earlier in the year due to COVID-19 but resumed in the summer when the group began to meet regularly via Zoom. Perhaps prompted by increasing community awareness about discarded single-use disposable waste during the pandemic, several new student and community members from the Zero Waste Ithaca group started to show up to the meetings regularly. In 2020, the committee worked on the following initiatives:

- Distribution of reusable bags and fliers.
- Support for a county resolution banning single-use food service items in county facilities.
- Research on textile recycling.
- Installation of water filling stations by student members from Ithaca College.
- Collaboration with Vanessa Greenlee, director of Cornell Alliance for Science, on a podcast production that promotes waste reduction.

Town of Caroline

Town Planning & Sustainability

The exciting sustainability activity in Caroline in 2020 involved moving forward to seriously consider more intentional planning tools for the Town of Caroline, given increasing growth pressures, the abundance of open land in Caroline, and the decline of traditional agriculture, especially dairy farming. The Town's



Planning Board completed an update of our 2006 Comprehensive Plan after seven years of diligent work by this all-volunteer group. The new plan was officially adopted on January 13, 2021. A key recommendation is to consider and enact stronger development guidance tools such zoning regulations and other measures that would enable the Town to guide development in a way that promotes the Town vision of a sustainable, livable community. The Town Board commissioned a Task Force on Land Use and Economic Development that researched zoning and other tools and drafted a revised Site Plan Review Law for consideration by the Town Board. They worked with a professional planner and completed their work in fall 2020, presenting a detailed report to

the Town Board. In December the Town enacted a 180-day Land Use Moratorium, anticipating moving forward to enact zoning regulations and/or other enhanced development guidance tools in 2021.

Brighten Up Caroline (Clean Energy Communities Program)

LED bulb distribution to Caroline households was curtailed because of the COVID pandemic. Caroline completed purchase of streetlight facilities from NYSEG on September 8, 2020, in preparation for the conversion of our 79 streetlights to LED fixtures. By owning the Town's streetlight facilities, we will save more than \$7,000 each year in facilities charges give the Town greater control of maintenance. We expect to complete these actions in 2021.

HeatSmart Tompkins

Key players from the Town's energy committee (Energy Independent Caroline) continued work with the Solar Tompkins Inc. HeatSmart Program, promoting home energy efficiency and heat pumps for space heating and cooling.

Town of Dryden

- The Town of Dryden advanced several initiatives in 2020 to reduce GHG emissions. These efforts received broad support in the community, which we attribute to effective communication, engaged residents, and tremendous work by volunteers.
- Dryden advanced effort to replace all its incandescent streetlight fixtures with energy efficient LED lights. The work is coordinated by a consortium of local municipalities working with the New York Power Authority.
- Dryden to complete its comprehensive plan update in 2021. New sections of the plan will address energy and sustainability. Information about the plan can be found at Dryden2045.org.
- Dryden awarded a \$500,000 grant, through the office of former state representative Lifton, to construct a pedestrian bridge over Rt. 13, creating a critical link for the 10.5-mile Dryden Rail Trail. \$1.5 million was previously awarded by the state. In addition to recreational uses, the project will improve options for non-vehicle commuters.
- Town of Dryden negotiated an unprecedented agreement with Dominion Energy to reduce fugitive methane and criteria pollutants at the company's Borger Station.
- Dryden remains certified as a Bronze Level New York State Climate Smart Community, one of 58 statewide. Bronze status is given to municipalities that have taken steps to implement climate-smart policies and projects.



Town of Enfield

- Contracted with Renovus for the installation of a solar array on the Town Highway Garage through a grant from NYSERDA.

- Installed heat pumps on the community building and town hall.
- Finalized the Comprehensive Plan with many environmentally sustainable initiatives.
- Finalized wind and solar laws to allow appropriate development of wind and solar installations while maintaining the rural character of our town.
- Established a Water Protection Committee and began drafting a Water Protection Plan.

Town of Ithaca

- Ithaca Energy Code Supplement (IECS): Worked with City of Ithaca to continue codifying IECS, which will mandate reduced greenhouse gas (GHG) emissions in new construction.
- New Neighborhood Code: Adopted the New Neighborhood Code, a form-based zoning and design code that will enable and guide the planning, zoning, platting, and building of neighborhoods that take the form of traditional neighborhood developments (TND). TND neighborhoods are characterized by having a compact form; a compatible mix of uses and building types; residential, commercial, civic spaces and parks that are within walking distance of each other; a range of housing types, sizes and density levels; and an interconnected network of streets and sidewalks.
- Green New Deal: Developed and adopted the Green New Deal goals and roadmap, and initiated implementation.
- GHG emissions reduction in existing buildings: Worked with Town of Bedford, City of Saratoga Springs, Sabin Center for Climate Change Law, and Hodgson Russ Attorneys to conduct research, develop state-level enabling legislation, and draft a model local law.
- GHG Inventory for government operations: Drafted an inventory with assistance from Cornell Cooperative Extension (CCE) and Susan Christopherson Community Planning Center.
- Town-wide LED Streetlight Upgrade: Worked with NY Power Authority on design and continued negotiation of purchase agreement with NYSEG.
- Route 96B/Danby Road sidewalk project: Completed the long-awaited 0.7-mile-long sidewalk, complete with LED pedestrian lighting.
- Outreach Efforts: Worked with CCE to organize solar energy options web event for residents and small businesses.
 - NYSERDA Clean Energy Communities grant: Finalized \$50,000 award to pay for sustainability projects.
 - Joined Ithaca 2030 District with Town Hall.

Town of Ulysses

- Completed installation of air source heating and cooling system, which in combination with solar panels on town hall and a renewal ESCO for electricity, make the town hall operation fossil free.
- Converted all lights in Town Hall to LEDs.
- Signed an agreement with NYSEG to convert our 10 Town streetlights to LEDs. Conversion will happen during 2021.
- Supported water hook up for a public restroom at Jacksonville Community Park to enhance park attendance. Restroom should be fully functional with a potable water source in 2021.
- COVID mitigation measures reduced building density and increased working from home, which reduced commuter trips to Town Hall.
- Conservation and Sustainability Advisory Council (CSAC) submitted, received, and implemented a grant to purchase new trees and shrubs as part of a new 2020 Arbor Week celebration.
- CSAC worked on a Tree Ordinance, subsequently adopted in 2021, to create a Tree Advisory Commission. Tree City designation will be sought in 2021.



- Town Board developed a ditch remediation plan to mitigate runoff into creeks leading to our watershed and submitted it to the Cayuga Lake Intermunicipal Organization to enable them to promote projects for available funding.
- Implemented an aerator mixer system in the Town's water tank to improve water quality for users in Jacksonville.
- Upgraded the modem on our ChargePoint EV charging system.
- The Town Board committed to maintaining the EV charging system for public use after the three-year grant period ended in mid-2020. New fees will be charged starting in April 2021 to recoup some of the cost to the Town.

APPENDIX

REPORT TO TCCPI

Ithaca Carbon Neutrality Student Project

Systems Engineering Program, Cornell University
Al George, arg2@cornell.edu
June 25, 2021

Introduction

This report summarizes the results to date of a large transdisciplinary student project, the Ithaca Carbon Neutrality project, sponsored by the Systems Engineering Program at Cornell University. This short report to TCCPI is a brief summary of the work done so far. In the next month or two a full report should be available publicly with the details of our results.

In 2019 the City of Ithaca and later the Town of Ithaca passed Green New Deal resolutions committing themselves to large reductions in greenhouse gas emissions from various sources in their municipalities while also paying attention to equity and affordability. In the summer of 2019 Nick Goldsmith of the city and Al George of Cornell agreed to a large cooperative student project by the Cornell Systems Program to help understand the work necessary to move towards reaching heating carbon neutrality by the year 2030. This report is a product of the Ithaca Carbon Neutrality team, which is made up of about 30 members each semester, including undergraduate and Master of Engineering (MEng) students as well as several faculty advisors.

The project team's work, which was informed by liaison with the sustainability staffs of the City and Town, is intended to help them consider the myriad of possibilities for reducing greenhouse gas emissions related to existing buildings' heating and cooling. The overall team has spent the past two years working on a comprehensive guide to applicable policies, retrofits, effectiveness, and equity considerations. This report is a brief update of the work we have done as of May 2021. A full report of the last two years work has been completed and is now being edited to be released publicly in the next month or two.

The Ithaca Carbon Neutrality Project is continuing during the fall 2021 semester and our next major report is anticipated to be available by approximately January 2022.

Systems Engineering Process and Results

- Throughout this project, the team utilized a Systems Engineering approach in developing report requirements and managing the workload. Systems engineering is a field that deals with managing very complex problems through a stakeholder goals and requirements-based approach to avoid omissions and provide a thorough and appropriate solution. It helps clarify the overarching goals of the project and the organizational make-up and methodology to be used by the team. Given the large scope of the Ithaca Carbon Neutrality 2030 project, utilizing systems engineering was a logical approach.
- In parallel with the analysis outlined above, the systems approach is intended to effectively balance budget, schedule, and scope. With goals and requirements for the overall project outlined, the team can baseline a schedule and work on realistic objectives within the abbreviated semester timeline. Action items and deliverables are tracked and monitored throughout the project through organizational tools set in place by the systems engineering subgroup. As stakeholders provide

input to system requirements, tasks can be rearranged and prioritized where more value can be realized within the overall report.

- The goal of Ithaca Carbon Neutrality 2030 is to consult and help the City of Ithaca to achieve its climate goals of carbon neutrality by the year 2030. A very important part of ICN’s strategy this semester has been trying to learn from meaningful and consistent dialogue between ICN and the many stakeholders – local businesses, nonprofits, educational centers, business owners, landlords, tenants, local government departments, and individuals.
- Therefore, this semester, ICN Policy made it a priority to reach out to many important stakeholders in the Ithaca area. The ICN team set up calls with organizations such as HeatSmart Tompkins, Tompkins County Department of Planning and Sustainability, Taitem Engineering, the Sciencenter, and many more. The team set up calls in order to give the different stakeholders a platform to discuss what they do, how they are involved with sustainability in Ithaca, recommendations they have for retrofitting buildings, and barriers they have encountered to sustainability. These ongoing conversations have been incredibly valuable to the ICN team. They are building a better understanding of our stakeholders and how we can help them, as well as letting the ICN team learn from their experience.
- The ICN Policy sub-team reached out to 42 stakeholders in Tompkins County to set up interviews. Of those stakeholders, ICN was able to set up calls with 20 stakeholders and compiled transcripts of the conversations including their answers to questions such as “What are the most popular retrofits you or your customers use?” and “What do you see as some of the biggest barriers to retrofitting?” and others seeking opinions on different incentives and retrofits. Results of these interviews will be spelled out in the main report to be released soon.
- A stakeholder analysis is an essential task, serving as the foundation for the entire project because stakeholder satisfaction is crucial to the project’s success. The analysis, which is described in the full report, gives project participants a quantitative justification for many of the crucial design choices that they will inevitably face, while giving them the ability to prioritize those design choices based on the weight of the stakeholder’s involvement.
- The result of our formal Stakeholder Analysis shows that for any particular type of decision and action, the Administrative Government holds a lot of influence, which grows larger and larger when multiple numbers of stakeholders are involved. This finding shows that leveraging Administrative Government must become a high priority if the project hopes to secure action from anyone else.
- Below is the overall stakeholder power ranking we derived from our analysis.

Rank	Stakeholder
1	Administrative Government
2	Homeowners
3	Landlords
4	Contractors
5	Public Services
6	Renters
7	Commercial
8	Developers
9	NGO

Table 1: Overall Stakeholder Power Ranking

Energy Analysis of Buildings in the City of Ithaca

- A large number of buildings of various types in the city were analyzed and the results of the analyses compared to actual available energy use data. Many conclusions were reached about the most desirable and cost-effective heating energy reductions for different types of buildings. They are too many to cover in this brief report to TCCPI. They will be detailed in the final report project report.
- Our primary method when analyzing various individual buildings utilized a combination of 3D building energy modeling software and plug-ins, including Rhino, Grasshopper, Climate Studio, and Diva. Once a building was modeled, we compared its predicted energy usage with the building's NYSEG data. We then adjusted the building settings according to our best estimates of what might have caused the differences in predicted and consumed energy. This helped us to understand how the actual performance was likely to indicate the origin of the differences. The outputs from each use case were processed through Excel to compare estimated energy performance, cost, payback period, and carbon emissions of each retrofit. An expanded description of the modeling and analysis methods will be provided in the main report
- In addition to the traditional retrofits and use cases that the ICN Modeling team has examined in the past few semesters, heat pumps are emerging as an increasingly viable and desirable energy efficient option for homeowners in colder climates like Ithaca. To determine how effective heat pump retrofits could be in residential buildings in Ithaca, the existing sources and energy consumption of building heating systems must be found. This data comes from a comprehensive energy audit performed in Tompkins County in 2008, the most recent of its kind. This audit information on residential heating types in the county allowed us to estimate the number and kinds of buildings in the various zoning areas of the city and what kinds of renovations or changes of heating sources they might need.
- We established a ranking of what retrofit options should be given priority when undergoing the renovation process. ICN's ranking method prioritizes retrofit options involved in building sealing, heat retention, and heat recovery (Tier 1). This is because the majority of Ithaca's emissions and energy expenditure across all building archetypes originate with the need to maintain a constant, comfortable internal temperature. Retrofit options involved with non-heating electricity use (Tier 2) have been given lower priority for two reasons. First, such electrical use contributes far less to total emissions/energy output than factors involved with building sealing and temperature regulation. Second, most non-heating and cooling electric use can be substantially mitigated by behavioral changes, such as remembering to turn off the lights when you are not present in a room, which may be more convenient and cost-effective. This will also be covered in further depth within the no-cost retrofit section (Tier 3). A table in the final report will summarize the costs and energy savings associated with Tiers 1 and 2. More specific cost breakdowns (i.e., by brand, type, or unit/area) will be found in Appendix 12.2 of the final report.
- Tier 3: Behavioral Change Retrofits – These retrofits can be applied to buildings that are not occupied at regular intervals, such as stores and businesses that are closed at night. They address the energy consumed when the buildings are empty, and there is no associated cost with any of these changes. While they are incredibly useful for the aforementioned types of buildings, sometimes, due to long response time, they may reduce comfort levels during times of high occupancy, so they are not necessarily recommended for residential buildings such as homes or apartments.

Overall Cost Analysis

- While varying extents of energy savings and reductions can be achieved through different combinations of retrofits that are most applicable to the individual unit/properties' needs, similar

inefficiencies were found to exist amongst buildings in like zones, and thus it was possible to extrapolate an approximation for the cost of such retrofits that are significant enough to help the city achieve its stated goal of net carbon neutrality by 2030. By modeling buildings from each of the zones established by the City, we can roughly estimate the financial burden to be shared by public and private shareholders for much of Ithaca as of today. Through our work we estimated that the total cost of retrofitting the buildings in the City-defined Residential zones 2A, 2B, and 3A (the 2nd, 1st, and 5th largest, respectively, in terms of building count) to be \$763,000, \$6.91 million, and \$290,000, respectively, or approximately \$8 million combined based on the cost needed to achieve the highest level of energy savings. This cost includes an estimated \$2.00/sq. ft. cost for the 1633 buildings in zone R-2b, \$0.65/sq. ft. for the 211 in R-3a, and \$0.68/sq. ft. for the 530 buildings zoned in R-2a, accounting for 68% of the city's residentially zoned area by square footage. With over 75% of the buildings zoned as R-2b being over 100 years old, this will likely be the zone experiencing the greatest variance in costs due to the nature of older buildings and differing amounts of work that have previously been completed on these properties. Further modeling using more precise zoning data from the City may be useful to expand the scope of and increase the accuracy of our current analyses.

Barriers to Implementation

Labor Analysis

- Broadly speaking, in New York State green labor is a fast-growing sector of the economy. From 2016 to 2017, clean energy employment grew 3.9%, while the overall state employment only grew 1.7% in that same time.¹ Unfortunately, Ithaca has not experienced the high concentration of clean energy jobs seen elsewhere in the New York State. A potential explanation for the trend is the relatively high poverty rate in the county and city, 16.9% and 39.2% respectively.²
- Academics tend to agree with this assessment. Ithaca's green labor availability has been determined to be "extremely low" according to verbal and written input from professors at Cornell University, such as Catherine L. Kling, Environmental Economics professor at the Dyson School of Applied Economics and Management and faculty director at the Atkinson Center for a Sustainable Future; Todd Gerarden, assistant professor in then Dyson School of Applied Economics and Management; and Tompkins County's local retrofitting companies such as Snug Planet. Other Cornell University professors involved in the Industrial Labor Relations School and the Environmental and Sustainability Department at CALS who were interviewed about this topic did not have specific knowledge of green labor availability in Ithaca and suggested we reach out to local companies involved in the industry, as they would be more knowledgeable and able to provide a more accurate explanation, which we did.
- According to Jon Harrod, CEO of Snug Planet, a sustainable retrofitting company that specializes in insulation and air source heat pumps, the primary reason for the absence of green labor workers in Ithaca is due to "a lack of employment opportunities in conjunction with the fact that skilled labor in general, whether it be for sustainability purposes or otherwise, is not a career path typically supported by our local high schools, or across the country, as much as a four-year college is." From Jon's general conclusions regarding the subject matter, he believes that an increase in green labor is certainly necessary, but it must begin by normalizing and encouraging younger generations to pursue green labor as an optimal career path. We must also ensure that working in such a field would provide them wages beyond the baseline livable standard. As the

¹ www.nyserda.ny.gov/all-programs/programs/clean-energy-workforce-development.

² www.census.gov/quickfacts/fact/table/ithacacitynewyork,tompkinscountynewyork/PST045219.

CEO of one of Ithaca's only sustainable retrofitting companies, John has made a commitment to ensure his employees are paid above baseline standards, not only to be competitive with similar companies, but to encourage his workers to continue developing skills and gain experience in this field due to its increasing relevance.

- Another barrier to Ithaca's green labor availability is a scarcity in green labor training programs that specialize in green building knowledge and techniques necessary to renovate existing facilities. As testament to this reality, a recent report by the Tompkins County Climate and Sustainable Energy Advisory Board, found that within the county there are *no current green training or readiness programs that are expected to survive over the long term*. The one current program in Tompkins County is the CCE Energy Warriors program, but due to its financing structure, it is not predicted to be financially stable in the long-term. In the future, BOCES or TC3 might be possible sources for green training or readiness programs.
- If the city or county is unable to train its own green workforce, it might force the city to outsource labor. This is not preferable because the adoption of Ithaca's Green New Deal in 2019 stipulates that the benefits of a green transition must be focused locally. Larger cities such as New York City and Boston have greater access to green labor training opportunities, primarily due to the fact that their economies are larger and can afford to allocate time and resources to organize such programs. Furthermore, because these cities have a larger impact on GHG emissions than smaller cities, there may be a greater push from environmental policy to prioritize these cities first, as opposed to smaller and more remote locations like Ithaca. As such, our first step is to determine if increasing availability and access to green labor training is a feasible option for the City of Ithaca's sustainability office to pursue. Given the timeline of our project, however, we would likely have to engage more experienced programs such as GPRO, located in New York City, to not only offer us immediate assistance in green labor training, but also help Ithaca build the necessary foundations to train our community in the long term. If green labor training is determined to be an appropriate step for Ithaca, state-funded training programs such as the six NYSERDA programs outlined in the appendix of the complete report could be a potential route to fund the needed increase in local green labor supply.
- Further discussion of green workforce policy is provided in our forthcoming full report.

Lack of Communication and Education

- In our interviews with a range of stakeholders, we discovered that there was a lack of knowledge about the retrofit options available and a general confusion as to the carbon neutrality goals of the City. Even people who described themselves as striving to live a sustainable lifestyle admitted that they had not heard of many of the retrofitting incentives we mentioned and did not know where to look to find more information. In general, interviewees did not seem particularly motivated to take on a retrofit project either.
- The current lack of communication and education around building energy efficiency will undoubtedly prove a challenge as the City tries to implement new policies. If residents and business owners are not aware of the benefits and of the necessity of renewing buildings, they might resist changes to their neighborhoods. Some people we interviewed mentioned that despite the public's interest in sustainability, NIMBY-ism still exists. For example, one interviewee referenced previous situations where Ithacans or Tompkins County residents opposed solar or wind farms. If a program involves the installation of external hardware, residents' neighbors might complain. To address this problem, many of the people we interviewed suggested emphasizing the financial incentives available to homeowners who retrofit their buildings as well as the money saved in an energy-efficient home.
- Another problem potentially caused by a lack of communication is delayed implementation. As one interviewee explained, people will not update their furnace or water heater until they break

down and the situation becomes an emergency. To achieve carbon neutrality by 2030, Ithaca residents must take voluntary action to make their buildings more energy efficient and sustainable now, because the process can be lengthy. Or, at a minimum, people should be given the information and encouraged to make a plan made about what to do when their present hot water heater or heating systems needs major repair or replacement.

Equity and Affordable Housing

- When Ithaca implements any policy, whether it directly relates to retrofitting its buildings, it must be done with respect to, and in conversation with, low-income communities and communities of color to ensure that they are included in the transition to a healthy and sustainable future. As mentioned by multiple stakeholders in our interviews, there are various barriers facing low-income residents when it comes to making green improvements in their homes, ranging from lack of financial incentives to inaccessible information and resources.
- In regard to retrofitting residential buildings, there is concern that such improvements will inadvertently raise the cost of living and push low-income residents out of their communities. This was the case in Seattle³ and cities across California,⁴ a process referred to as green gentrification. Locally, fears of gentrification are already apparent. In March 2021, there were protests outside the Cayuga Gardens Apartments on West Hill in response to rumors of renovations.⁵ Cayuga Gardens primarily houses low-income tenants, and those residents were concerned that renovations on the property would result in substantial rent increases. These protests have major implications for green development; we may expect the same backlash to resurface when landlords decide to retrofit their buildings. Therefore, one of the key things that the City of Ithaca should consider is implementing policies to ensure that landlords and/or building owners will not raise rents after retrofits are made without their tenants' consent.
- The City of Ithaca must also work to address its lack of affordable housing as it proceeds on the path to carbon neutrality. In Seattle there were complaints that policies concerning green development were taking priority over affordable housing⁶ and the same concerns are likely to surface in Ithaca.

Renters, Landlords, and Split Incentives

- Another significant challenge that Ithaca faces has to do with its large renter population. With the nature of traditional leasing agreements, an issue of split incentives manifests in which installing energy efficient retrofits results in one party paying for the improvements while the other party benefits from the reduced utility costs. When tenants are paying the utility bills, the landlord has minimal incentive to install energy efficient measures within their building because they won't receive the savings that will cover the cost of installment. On the other hand, the tenants are

³ <http://www.bcneuj.org/2019/12/03/how-green-gentrification-is-compromising-seattles-last-affordable-neighborhood/>

⁴ https://nature.berkeley.edu/classes/es196/projects/2018final/SandovalV_2018.pdf

⁵ <https://ithacavoice.com/2021/03/housing-protest-in-west-hill-shows-fears-of-further-gentrification/?fbclid=IwAR3YbKq8EZofDCGZ8qpGSgTMNBswM8zeZNSSduaEflDo-GsIcz-Cc5KnIfo>

⁶ <http://www.bcneuj.org/2019/12/03/how-green-gentrification-is-compromising-seattles-last-affordable-neighborhood/>

unable or unlikely to make investments in property that they don't own. This market failure results in housing that wastes energy and rents that cost more than they should.

- There are also other related obstacles to installing retrofits in rental properties. For example, since retrofits may be invisible to tenants – take for example, updating kitchens in an apartment building versus adding insulation – landlords tend to prefer improvements that are more obvious and marketable. Furthermore, because more intensive retrofits will affect the building and can be disruptive to tenants, landlords are wary about residents complaining about noise and security.
- Overall, split incentives are a barrier to wide-scale adoption of energy efficient retrofits among Ithaca's various renter-occupied properties.

Electrification & Renewable Energy

- Heating buildings with electricity rather than fossil fuels will move Ithaca a long way towards achieving net-zero carbon emissions. Electrifying buildings can make have a huge impact on saving energy, saving money, and reducing emissions. Currently, residential and commercial buildings combine for 40% of America's energy consumption and 62% of Tompkins County's; this energy is often used for things like heating, cooling, and lighting.⁷ It's vital to lower these percentages and to ensure that any energy-intensive processes aren't wasteful or carbon-emitting. Electrification helps us accomplish both goals. Examples of electrifying retrofits in buildings include switching from furnaces and boilers to heat pumps and installing water source heating and cooling, as opposed to the usual air-to-air heat pump heating and air conditioning. For example, deep water source cooling, an approach adopted by Cornell, uses the temperature differential from surface air to the bottom of a body of water to cool buildings. But, like other technologies, it is only applicable in some circumstances.
- Ithaca must prioritize electrification because of its cost and energy saving benefits. For new buildings, electrification is often cheaper; builders can avoid installation of gas lines and energy savings help mitigate rising electricity bills. This might be less true depending on what technology is used; heat pumps, for example, require their own specialized infrastructure. For existing buildings, the costs of installing retrofits can be high but state incentives and the reduction of energy use save money in the long run. The best way to begin is to focus on improving the thermal performance of the building envelope. Then heat pumps and other energy efficient measures can be properly scaled to ensure maximum building performance.
- The installation of heat pumps demonstrates how electrification can help save homes energy and money. Both air source and ground source heat pumps are highly efficient. Air source heat pumps (ASHPs), however, are often less expensive. A typical ground source heat pump (GSHP) system can cost about \$30,000 before incentives whereas an ASHP system will cost \$12,000-\$20,000 before incentives, with individual units costing \$3,500-\$5,000.⁸ Fortunately, incentives to switch can greatly reduce the costs in either case. HeatSmart Tompkins is already incentivizing and installing heat pumps across the Tompkins County area. Of course, building electrification in Ithaca and Tompkins County still has lots of room for improvement, but getting off gas will be necessary for reaching carbon neutrality.
- When electrifying retrofits are made to homes, it's important to ensure that the electric energy sources powering the retrofits are actually green. This means avoiding non-renewable energy sources like coal, oil, and most nuclear power which has both environmental risks and

⁷ <https://archive.curbed.com/2019/9/19/20874234/buildings-carbon-emissions-climate-change>

downstream radioactive waste disposal problems. Instead, there are three main paths that Ithaca might employ: hydropower plants, solar farms, or wind turbines.

Communication Campaign

- To address the knowledge gap we have observed in our stakeholder interviews, the City of Ithaca needs to develop a comprehensive communication and educational campaign. To be effective and equitable, this communication campaign must strive to provide the most essential information in a simple way, using outlets which are accessible to all Ithaca residents. For example, the communication campaign should incorporate multimedia like social media and websites as well as more traditional printed forms of information like brochures.
- One barrier to implementation of retrofits is the overwhelming number of decisions that must be made. Each building is different, and retrofits vary by requirements, price, and benefits. To help make the process easier, we have drafted three separate brochures that lay out the retrofit options for residential, commercial, and historical buildings. The brochures have a clean and simple design and use visual aids to convey information at a glance. For example, the brochures use “stars” to rate the amount of energy savings each retrofit offers and clock symbols to represent the length of time each retrofit requires. All of the brochures clearly state the financial benefits of retrofitting, offer helpful tips, and direct the reader to local resources (other websites and companies that perform energy audits or can install retrofits, for example). Perhaps most importantly, the brochures help reframe individual retrofits as an essential part of Ithaca’s plan to reach carbon neutrality by 2030. Much of the information provided in these brochures will also be available in digital form on a website that we are currently developing.
- In addition to these visual forms of communication, several of the stakeholders we interviewed suggested using interpersonal communication to tap into the power of social norms and peer pressure. One interviewee had the idea of using ambassadors to reach out to specific communities and allowing people to view the energy usage of others in their neighborhood. The latter suggestion is supported by social science research findings that showing homeowners how their energy use compares to their neighbors motivates them to be more efficient.⁹

Economic Incentives and Funding Options

- The full report reviews various existing and potential economic incentives including permit relief, tax abatements, green building tax credits, green mortgages, revolving loan funds, and net metering as well as green bonds, and environmental impact bond funding options.

Economic Incentives Relevant to Split Incentives

- As was mentioned previously, Ithaca is unusual in its large percentage of renters (approximately 75%) in the city. The full report reviews a number of possible actions that could be taken to motivate landlords and renters to move rental buildings towards carbon neutrality. These include green leases, energy benchmarking to ensure that both parties would benefit from upgrades, and existing Pay-for-Performance models.

⁹ <https://doi.org/10.1038/s41562-018-0434-0>

Conclusions and Future Work

- Meeting the ambitious goal of achieving community-wide carbon neutrality also means that communities will be transitioning from the presently higher-paying fossil fuel work to green jobs. As such, this transition must ensure employment opportunities with sustainable wages and benefits for working-class communities. Shifting to green work offers the city a large-scale opportunity to meaningfully empower and engage with communities that face barriers to employment. Investing in workforce training through work readiness and apprenticeship programs is vital in this regard. At present, the Tompkins County Industrial Development Agency (IDA) has no policy that requires developers to hire locally and promote Project Labor Agreements that can ensure labor protections and worker representation. Excluding cases in which there is a documented scarcity of local labor, coupling tax exemption policies with those that ensure the prioritization and protection of local green workers, is very important for a just transition to a sustainable economy and should be a high priority for the IDA and Ithaca area communities.
- A comprehensive communication and education campaign will be essential to the successful implementation of Ithaca's Green New Deal plan. Our stakeholder outreach revealed that many Ithaca residents are confused about the City's carbon neutrality goals and the necessity of retrofitting to increase energy efficiency in buildings. Deciding on which retrofits to implement can also be overwhelming given the amount of information available. To accomplish the city's carbon neutrality goals, Ithaca residents need to take action now. An effective communication campaign would help clarify the benefits and incentives of retrofitting and empower residents to make informed decisions about their homes and businesses.
- In the future, we are planning on working closely with Luis Aguirre-Torres, Sustainability Director for Ithaca, as he works to raise awareness of Ithaca's Green New Deal plan. Specifically, we plan to contribute to his 1,000 Conversations about Climate Change campaign. The idea is to record 1,000 people in Ithaca having informal conversations about climate change – the problems it causes and the solutions which are most promising – and then post them on a website. This project will help the city better understand what Ithaca residents think about climate change, where they see the worst impacts of climate change, and what solutions they want. It will also hopefully bring more awareness to the city's carbon neutrality plans and encourage community participation. Our role in this project may be promoting the campaign and helping to facilitate conversations.
- The economics sub-team of ICN Policy will conduct a tax revenue analysis to find out how much additional tax revenue the city will generate as a result of the implementation of building retrofits. First, the team members will research how much tax revenue is generated per type of retrofit. We can figure out total tax revenue generated for the city per type of retrofit by estimating the quantity of each retrofit type that will be installed. Finally, economics team members will compare their findings to the tax revenue that would be generated by other green building plans (property tax, income tax, etc.).
- Another consideration for the ICN Policy team is to truly expand our work to include what our name describes, carbon neutrality for the City of Ithaca. This goes beyond just existing buildings and includes work on electrifying buildings and the electricity supply from the grid, shifting power sourcing to renewable energy from natural gas, and making transportation more sustainable. We've done some preliminary work on all of these topics, but a deep dive is necessary for Ithaca truly to meet its goal of carbon neutrality by 2030. Retrofitting buildings is not enough; it's only part of the solution. With transportation, we would aim to look into recommending policies that improve the attractiveness of TCAT, EVs, rideshares, and non-car transportation. With electrification, we would consider both how to modify buildings to accept electricity as its source, as well as how to modify Ithaca's energy mix to use more electricity to

replace fossil fuels. For renewable energy, we'd look into capacity, economic feasibility, and distribution of energy. This might include distributed energy resources (DERs) such as rooftop solar or other local battery storage as well as larger solar and wind farms.

- The members of the Ithaca Carbon Neutrality Project are looking forward to continuing working together with everyone in the Ithaca area a green, sustainable, and equitable Ithaca.