

Building Electrification in Tompkins County

Successful programs to inform NYS
program and policy development

A presentation to the Executive Chamber
John O'Leary, Deputy Secretary for Energy and Environment
Sean Ewart, Senior Policy Advisor for Energy
January 10, 2022



Introductions

- **Andrea Aguirre** - Andrea was the program director for the Business Energy Advisor program that provides technical assistance to business owners and facility managers, helping them understand energy options and set energy goals for their building projects. gaa48@cornell.edu /832-316-4531
- **Peter Bardaglio** - Founder/exec director of [Ithaca 2030 District](http://Ithaca2030District.org), founder/coordinator of [Tompkins County Climate Protection Initiative](http://TompkinsCountyClimateProtectionInitiative.org), former Ithaca College provost and Goucher College academic dean/history professor. Co-author of *Boldly Sustainable: Hope and Opportunity for Higher Education in the Age of Climate Change* (2009). pbardaglio@2030districts.org 607-229-6183 (cell) .
- **Katie Borgella** - Commissioner, Tompkins County Department of Planning and Sustainability. Katie has been integrally involved in developing Tompkins County's Energy Roadmap, as well as overseeing our greenhouse gas inventory and plans for electrification of county facilities. kborgella@tompkins-co.org
- **Diane Cohen** - Founder/Exec Director [Finger Lakes ReUse](http://FingerLakesReUse.org) that runs two Community ReUse Centers, award-winning waste diversion and piloting building a deconstruction program - preventing as much as 70-90% of building materials from going to landfills. Finger Lakes ReUse also runs job training programs for diverse, hard to employ individuals through many collaborations with BOCES and others. diane@fingerlakesreuse.org
- **Brian Eden** - Brian is a member of the County's Climate and Sustainable Energy Advisory committee, and previously Chair of the County's Environmental Management Council. He served for several years as Chair of HeatSmart Tompkins -a program promoting adoption of heat-pumps that started in Tompkins County that was subsequently adopted by NYSERDA for statewide implementation. Most recently, Brian has successfully advocated for full building electrification for the Northside Apts affordable housing project. Contact: bbe2@cornell.edu 607-272-8595.

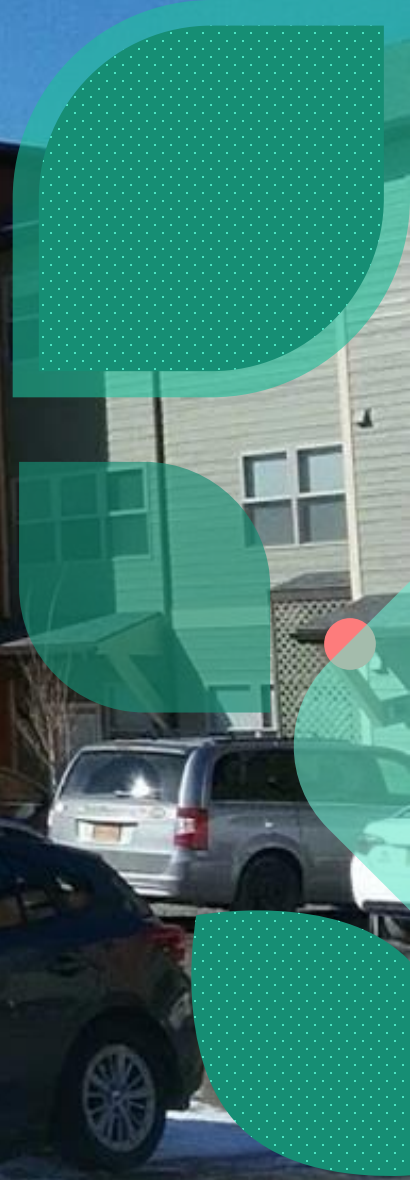
Introductions

- **Gay Nicholson** - founder, exec director Sustainable Finger Lakes. Among their many successful programs is their Finger Lakes Climate Fund - a voluntary carbon offset program to benefit low income residents in improving their home's energy efficiency and electrification.
gay@sustainablefingerlakes.org
- **Martha Robertson** - Tompkins County Legislator (20 yrs, just retired), has served as chair of the Tompkins County Industrial Development Agency and chair of the Community Housing Development Fund, a partnership among Tompkins County, the City of Ithaca, and Cornell University to support development of affordable housing. Contact mrobertsonnext@gmail.com, 607-592-3119.
- **Ian Shapiro** - Founder and Sr. Engineer at Taitem Engineering, co-author of the books Green Building Illustrated (2014, 2nd edition 2020) and Energy Audits and Improvements for Commercial Buildings (2016) Ian has consulted for NYSERDA on their RetrofitNY initiative for low income housing as well as other programs. Locally, Ian has been involved with EcoVillage at Ithaca and as technical advisor to the Business Energy Advisor Program, IDA enhanced abatement policy, and the Ithaca Energy Code Supplement. imshapiro@taitem.com / 607 351 0451.
- **Liz Walker** - (recently retired) Founder/Exec Director of EcoVillage at Ithaca - a world renowned development for sustainable living, with 100 homes, four organic farms, and educational programs. Liz led development of the TREE cohousing neighborhood - built to LEED Platinum and Passive House standards, which won two DOE awards for Zero Energy Ready homes - designed to be affordable, sustainable, and suitable for aging in place. Liz is author of two books on sustainable living. EVI residents have an ecological footprint that is almost two-thirds less than typical Americans. ecovillageliz@gmail.com
- **Irene Weiser** - coordinator of Fossil Free Tompkins, former Councilmember, Town of Caroline, Vice-Chair, Tompkins County Climate and Sustainable Energy Advisory Committee; member of the Renewable Heat Now coalition. irene32340@gmail.com 607.435.3010

Agenda

- Introductions
- Purpose – share programs, opportunities, barriers, recommendations
- Program/project overview
 - **New Construction**
 - Ecovillage passive house design
 - Building Density and Industrial Development Agency policies
 - Business Energy Advisor program
 - Ithaca Energy Code
 - **Existing Buildings**
 - Ithaca 2030 District
 - Lessons from NPA
 - Tompkins County Facilities Electrification
 - **Low Income and Affordable Housing**
 - Finger Lakes Climate Fund
 - Affordable Housing
 - Community Housing Development Fund
 - **Workforce Development and ReUse**
 - ReUse/Deconstruction as pathway to Workforce engagement
- Discussion

New Construction



EcoVillage Passive House design

<https://ecovillageithaca.org>

Liz Walker

- 40 homes built 2013-2015
 - 15 apts in Common House, + 25 houses
 - \$150/sq ft bldg. costs vs >\$200 conventional construction
- Passive House and LEED Platinum
 - Excellent insulation, air-sealing
 - Heat Recovery, Energy Recovery
 - electric baseboard heating
- Surprise! Net Zero performance

It's possible to build homes that are extremely energy efficient at same or less cost than typical construction!



Industrial Development Agency

it's not just "industrial" anymore...

<https://tompkinsida.org/>

Martha Robertson

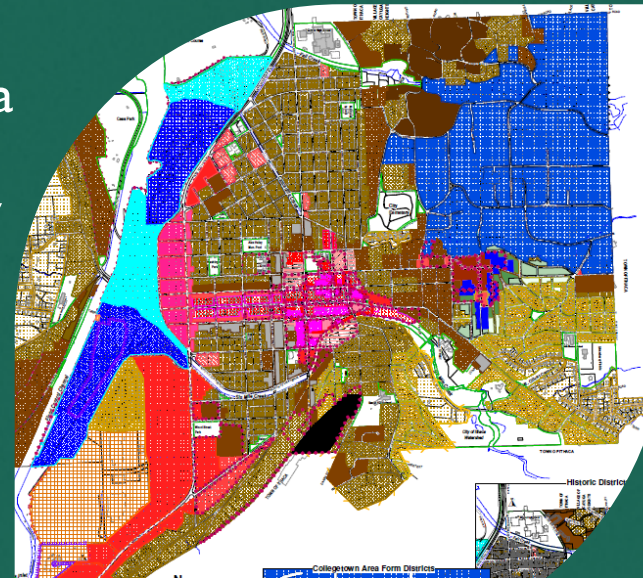
Density Policy

- Efficiently incentivizes smart growth
- Short-term loss of new taxes drives 50+ year siting decisions
- Stimulates vibrant economic growth, e.g., hotels, housing, offices, retail, light industrial



Enhanced Energy Abatement

- Front-load additional abatement to support extra installation costs for electrification
- Works well with NYSERDA and Business Energy Advisors programs



Housing Policy

- Developers build 20% affordable units or pay \$5000/unit into Housing Fund.





TOMPKINS COUNTY *Business Energy Advisors*

<https://www2.tompkinscountyny.gov/bea>

Andrea Aguirre

- **Technical support to business owners and facility managers to understand energy options and set energy goals**
 - Funded by IDA, NYSERDA, Tompkins County
 - >30 businesses assisted
 - *** Early Intervention in Early Planning Phase***
- **Program Structure:**
 - Business representative consults with qualified energy engineer
 - Discuss opportunities to save energy and operational costs
 - Provide advice on incentives, financing, and application processes
 - Provide guidance with setting and reaching energy goals
 - Recognize participation and commitment, if desired

Ithaca Energy Code

<http://www.ithacagreenbuilding.com>

Ian Shapiro

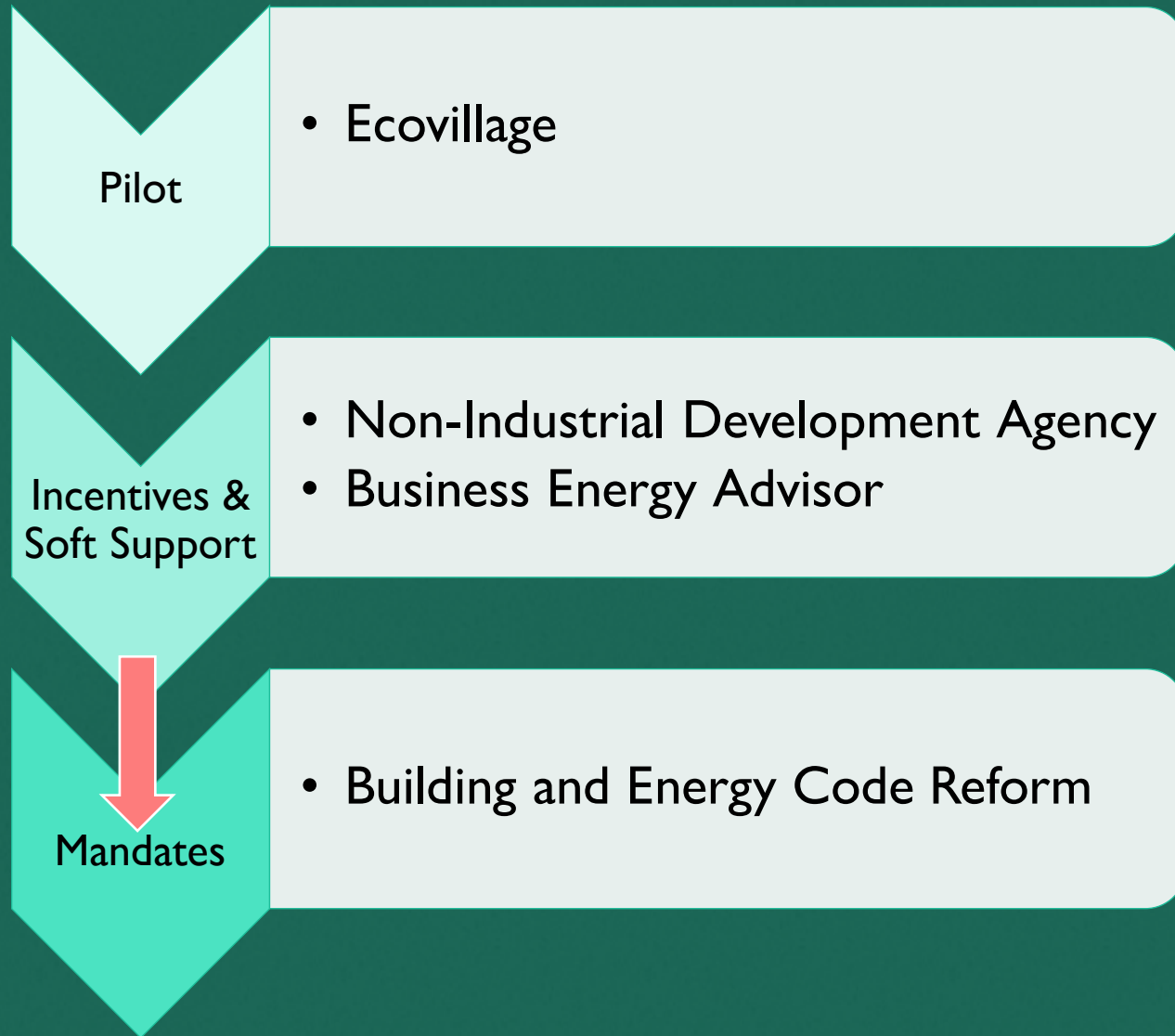
- Effective Energy Code must be:
 - Affordable
 - Impactful
 - Flexible
 - Achievable

Adopted 2021

- 2021 - 40% less carbon emissions in new buildings
- 2023 - 80% less carbon emissions in new buildings,
- 2026 - 100% less carbon emissions
(zero energy and fossil fuel free)



Path of Change



NYS must move beyond pilots and demonstrations and move “to scale” while keeping incentives and soft support

Existing Buildings





<https://www.2030districts.org/ithaca>

Peter Bardaglio

Provides a non-competitive atmosphere where building owners, community organizations, and professionals come together to share best practices and accelerate market transformation in Ithaca's buildings.

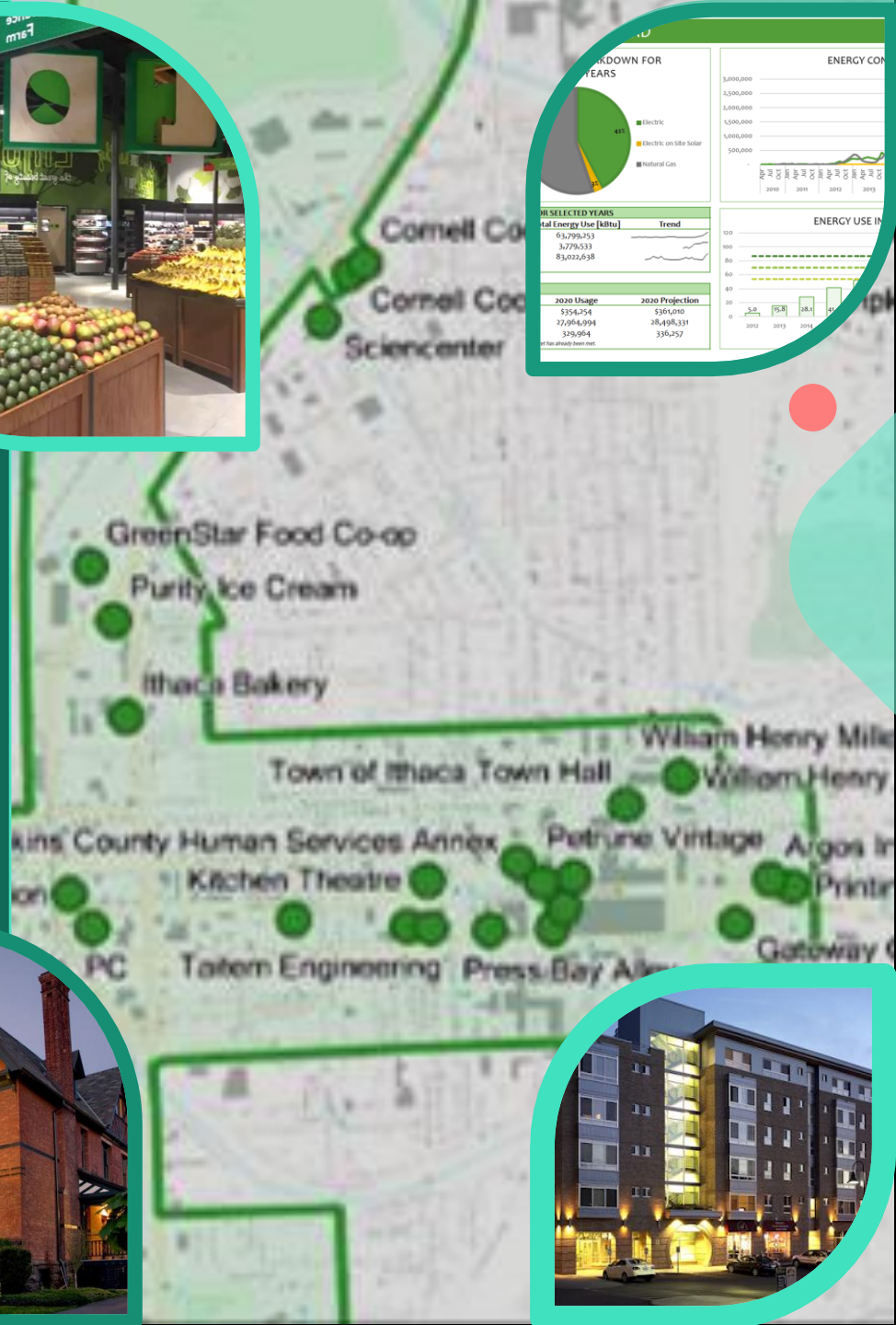
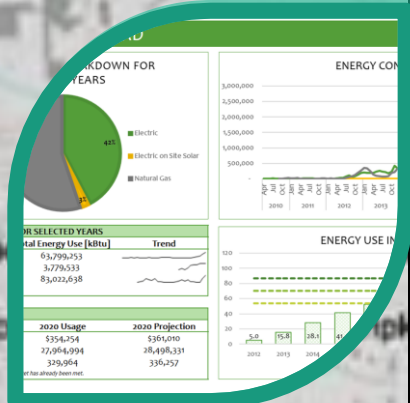
GOALS: Energy and Water Reduction

20% x 2020

35% x 2030

50% x 2030

- 27 property members, 34 buildings & 495,325 sq. ft.
- Performance dashboard to track progress
- 2020 Results:
 - avg. energy use reduction = 20%
 - avg. water use reduction = 34%
- 2020 progress report [here](#)
- Quarterly e-newsletter and [resources](#)
- [Case studies](#)



Lansing Non-Pipe Alternative

Irene Weiser

COMMERCIAL CHALLENGES	RECOMMENDATIONS
Capital improvement planning timeline 5+ yrs out, other project priorities	Energy-as-service Heat recovery low-hanging fruit
Facilities staff lack energy expertise	Tech Advisor via NYSERDA Clean Energy Hub or Clean Energy Community Coordinator
Non-profit and municipal facilities not eligible for tax incentives	Prioritize \$\$ for schools, churches, other community gathering places = educate the masses Investor-owned, energy-as-service model, long payback periods
Added \$ helps, but NPA/BCA process too cumbersome, and time-consuming	NYSERDA establish rebates per sq/ft



Tompkins County Green Net Zero Facilities

Katie Borgella <https://www2.tompkinscountyny.gov/planning/sustainability>



3 Phases of Facilities Improvement

Energy Project Comprehensive Scope													
Measure	Public Works Facility	Human Services Building	Library	Mental Health Building	Main Court House	Old Jail	Old Court House	Health Dept	Household Waste Facility	Recycling & Materials Mgmt.	Emergency Response	Annual Savings (\$)	Carbon Emissions Reduction (MT)
LED Lighting Upgrade	X	X	X	X	X	X	X	X	X	X	X	\$58,561	92.6
Building Envelope - Weatherization	X	X	X	X	X	X	X	X		X		\$3,543	34.5
Water Conservation	X	X	X	X	X	X	X				X	\$17,386	3.9
Pipe and Valve Insulation	X	X	X	X	X	X	X	X			X	\$3,153	30.8
Plug Load Controls	X	X	X	X	X	X	X	X		X	X	\$756	1.7
Window Film	X	X										\$1,364	9.0
TEGG (Electrical Panel Inspection)	X	X	X	X	X	X	X	X	X	X	X	\$6,066	9.8
Computer Power Management	X	X	X	X	X	X	X	X	X	X	X	\$3,149	6.9
Transformer Replacement		X	X	X								\$7,730	14.7
VFD on Hot Water Pumps	X											\$395	0.6
VRF Installation				X								\$6,157	71.4
Controls Optimization	X	X	X	X	X	X	X	X		X	X	\$13,369	73.8
Window Replacement				X								\$1,221	2.8
Roof Replacement			X									\$329	3.1
Geothermal Installation	X											\$6,094	122.3
Boiler Replacement		X									X	\$2,933	28.4
Rooftop Unit Replacement			X									\$2,349	117.2
Solar PV - Roof Mount	X		X						X		X	\$85,798	176.3
Solar PV - Car Port		X								X		\$25,343	48.9
Garage Door Controls	X											\$1,189	11.9
DHW Heater Replacement	X	X										\$776	6.2
PTAC Replacement										X		-\$434	9.3
Geothermal Installation								X				\$6,637	98.6
Retro-Commissioning	X	X	X	X	X	X	X	X		X	X	\$21,444	66.1
Solar PV - Field Mount												\$135,823	265.5
Distributed Energy Storage - Battery		X										\$5,813	-0.7
Geothermal Installation					X							\$5,127	67.8

Phasing Legend

Phase I	2022-2023
Phase II	2024-2025
Phase III	2026

Total Annual Savings All Phases \$422,071

Phase	Project Cost	Carbon Reduction (MT)
Phase I	\$7,314,003	463.1
Phase II	\$10,393,915	511.5
Phase III	\$10,388,960	398.7
Total	\$28,096,878	1,373.3

Current Carbon Emissions	1,373.3
Carbon Emissions After Phase I	910.2
Carbon Emissions After Phase II	398.7
Carbon Emissions After Phase III	0.0

An aerial photograph of a residential development. In the foreground, there are several two-story townhouses with brick and grey siding. Behind them is a parking lot filled with cars. In the background, there are larger, modern multi-story apartment buildings with brick and grey facades, some featuring yellow accents. The surrounding area includes trees with autumn foliage and a residential neighborhood in the distance.

Low Income & Affordable Housing

Finger Lakes Climate Fund

<https://www.fingerlakesclimatefund.org>

Gay Nicholson

74 PROJECTS

helping individuals, families, & businesses

OUR GRANT AWARDEES INCLUDE...



young families



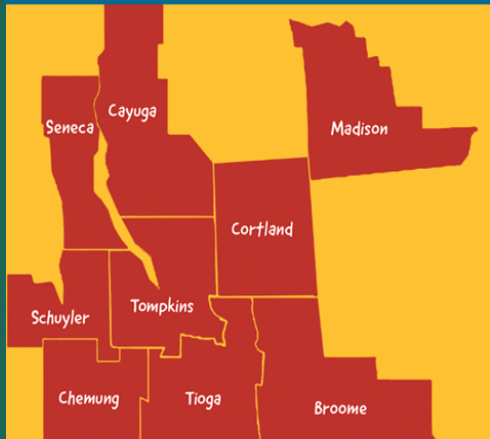
senior citizens



single parents



small business owner



58

Air and ground source heat pumps



23

Heat pump hot water heaters

6,983 tons of CO₂ offset

\$125,000

in Fund Grants



Community Housing Development Fund

Martha Robertson

<https://www2.tompkinscountyny.gov/planning/housing-choices-housing-fund>

- **Partnership of Tompkins County, City of Ithaca, and Cornell University**
 - Since 2009, virtually all affordable housing in TC built with CHDF funds.
 - Flexible: supports ownership (via land trusts) as well as rentals.
 - New funding sources: towns, and IDA through its Housing Policy.
- **NYS Housing & Community Renewal recognizes need for \$ for building electrification: Northside Apts.**
 - We've proven that all-electric AH can be built, for just a small amount more.
 - To meet CLCPA, EJ goals, HCR must provide \$ increment for heat pumps.
- **Replicating CHDF?** Major employers, with counties and municipalities.



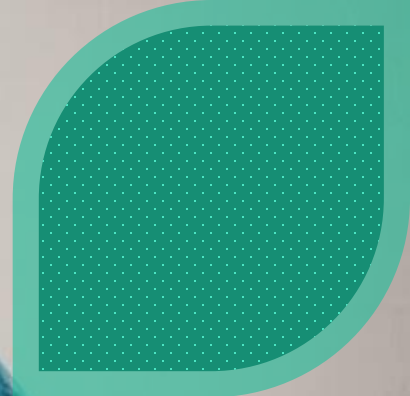
Affordable Housing Lessons

Brian Eden

- Important to build/retrofit with high-quality materials and high construction standards, aiming for durability and resilience to last 60-80 yrs, endure extreme weather conditions.
- Beware! Tighter building envelopes exacerbate air-quality health impacts – mold, lead, asbestos, fossil-fuel combustion must be avoided/remedied.
- Avoid reliance on low-cost bids and inexperienced contractors.
- Earlier poor-quality heat-pump installation experiences/stories pose a barrier to current widespread adoption.
- Provide information and training to developers, contractors, government agencies and residents!
- Maintenance concerns, staff training needed.



Workforce Development



ReUse, Deconstruction & Workforce Development

<https://ithacareuse.org>

Diane Cohen

- GOALS: reduce waste, relieve poverty, teach skills through re-use
- VISION: a just, resilient, waste free world that values people and resources.

Building Deconstruction & other reuse activities can be an effective on-ramp for workforce engagement/development while also generating revenue, reducing waste & pollution and conserving energy/fossil fuel.

Career Pathways program - innovative, collaborative workforce engagement initiative (TST BOCES, Cornell Cooperative Ext, FLReUse, Trade unions and others)

Finger Lakes ReUse is demonstrating effective workforce engagement with **80 permanent living wage employees** - 20 of whom were previously receiving long-time public assistance.

ReUse and deconstruction activities (tools, safety, trainings and certification, etc) as stepping stone to jobs in HVAC, Building Envelope and Electrification.

