



NYSERDA

Clean Heating & Cooling, Energy Studies and Net Zero

Otsego County Chamber Energy Infrastructure and Economy Summit

January 31, 2019

Scott Smith

New York State Energy Plan

Reforming the Energy Vision (REV)

40%

Reduction
in GHG emissions
from 1990 levels

Reducing greenhouse gas (GHG) emissions from the energy sector—power generation, industry, buildings, and transportation—is critical to protecting the health and welfare of New Yorkers and reaching the longer term goal of decreasing total carbon emissions 80% by 2050.

50%

Generation
of electricity from
renewable energy sources

Renewable resources, including solar, wind, hydropower, and biomass, will play a vital role in reducing electricity price volatility and curbing carbon emissions.

600

 TBTU

Increase
in statewide energy
efficiency

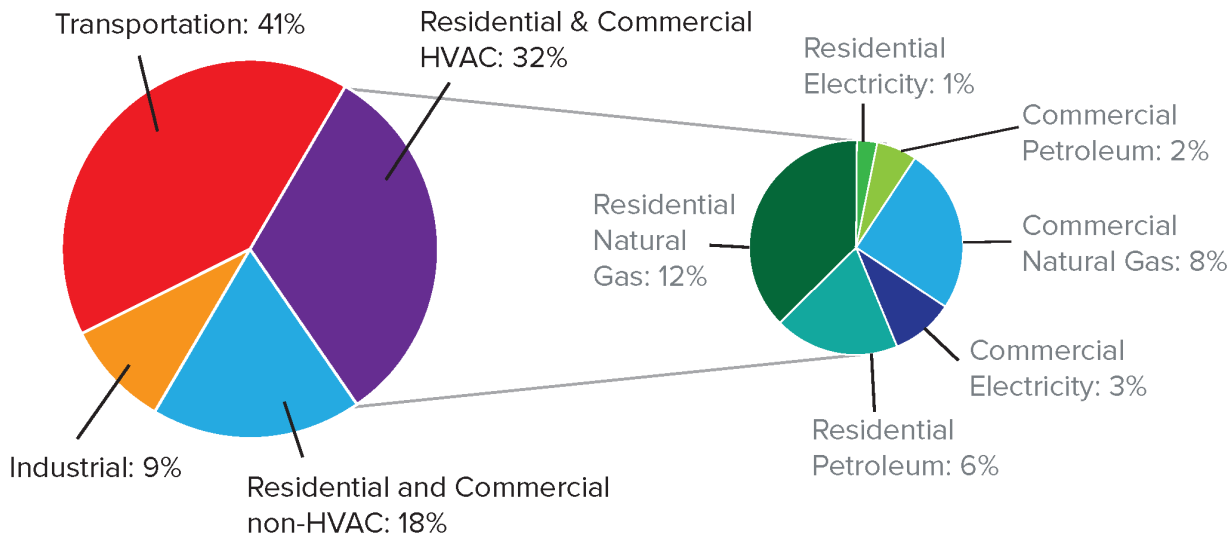
Energy efficiency results in lower energy bills and is the single most cost effective tool in achieving clean energy objectives. 600 trillion British thermal units in energy efficiency gains equates to a 23% reduction from 2012 in energy consumption in buildings.

Outline

- Clean Heating and Cooling
- Assistance for businesses
 - FlexTech and audits
- Net Zero Energy Highlights

Clean Heating & Cooling Benefits

Estimated 2014 NYS GHG Emissions from Fuel Combustion



Total 2014 New York State GHG Emissions from Fuel Combustion: 181 MMtCO₂e

Heating and cooling is responsible for about 1/3 of GHG emissions

- Role of RH&C in reducing GHG emissions 40% by 2030
- RH&C can also provide other benefits including: bill savings, improved comfort, electricity grid benefits

Earth Day Announcement

- New Energy Efficiency 2025 Target is Equivalent to Energy Used by 1.8 Million Homes
- Energy Efficiency Strategies Will Deliver Nearly One Third of State's 2030 Greenhouse Gas Reduction Goal
- \$36.5 Million in Investments Will Prepare up to 19,500 New Yorkers for New Jobs
- Order issued 12/13/18 directing NYSERDA to support the utilities in the development of statewide, \$250M 5 year program for heat pumps.

CH&C Programs Launched since June 2017

- **Air Source Heat Pumps (ASHP) Program [PON 3635 \$10.95M]**
 - NYSERDA will provide up to \$10.95 million in incentives to participating installers for the installation of program qualified ASHP systems in residential sites to include single-family and multifamily buildings through 2020. Incentives of \$500 per installed program qualified ASHP system are available only to participating installers on a first-come, first-served basis, up to \$500,000 per participating installer.
 - 198 Participating Installers
- **Ground Source Heat Pumps (GSHP) Rebate Program [PON 3620 \$15M]**
 - Offers \$15 million to support the installation of ground source heat pump systems at residential, commercial, institutional, and industrial buildings. Funding is available only to eligible designers and installers of renewable heating and cooling systems that have been approved by NYSERDA through June 2019.
 - 68 Participating installers
- **Clean Heating & Cooling Communities Campaigns [PON 3922 / \$2 Million available in second round, \$8 Million total investment]**
 - Support for communities to increase customer awareness of CH&C technologies, reduce installed costs, and jump-start the market by implementing multi-year campaigns consisting of community-based outreach and education focused on CH&C.
 - Retained consultant to provide technical assistance to communities
- **Geothermal Clean Energy Challenge [\$3.5 Million Available]**
 - NYSERDA and NYPA will identify the best candidates for large, multi-building geothermal ground-source heat pump installations by providing free technical assistance and financial support. Open only to qualified colleges and universities, K-12 schools, State and local governments, and hospitals in New York State.



CH&C Heat Pump Incentive Programs

NYSERDA	ASHP Air Source Heat Pump	GSHP Ground Source Heat Pump
Program Funds	\$10.95 M	\$15 M
Incentive Level	\$500 per outdoor unit	\$1200 - \$1500 per thermal ton
Applicant	Approved Contractor	Approved Contractor, Designer, Driller
Paid to	Contractor	Contractor to Customer
Eligible Project	NYS, Electric System Benefit Charge	NYS, Electric System Benefit Charge
Eligible Site	Residential Single family & Multi family	Residential, Multi family, Commercial
Eligible Equipment	Northeast Energy Efficiency Partnership (NEEP): Cold Climate Specification List	Air conditioning, Heating & Refrigeration Institute (AHRI): Efficiency Standard
Quality Assurance	Completed Commissioning Check List	Site Inspections
Financing	Green Jobs Green NY (GJGNY) in Q4 2018	Green Jobs Green NY (GJGNY)
End Date (or until funds are exhausted)	December 2020	June 2019
Program Performance to date		
Contractors to date	234 Contractors	77 Contractors, 21 Drillers
Projects to date	4,175 Projects (average 2 units/project)	709 Applications 506 Completed projects



CH&C Community Campaigns

- **Program size:** \$3.3 million to date
- **Target:** locally organized community efforts at the county, city, borough, or regional level
- **Objective:** for communities to increase customer awareness of CH&C technologies, reduce installed costs, and jump-start the market by implementing multi-year outreach & education campaigns focused on CH&C
- Encouraging installations in low-to-moderate income residents
- NYSERDA funded technical assistance to run effective campaigns

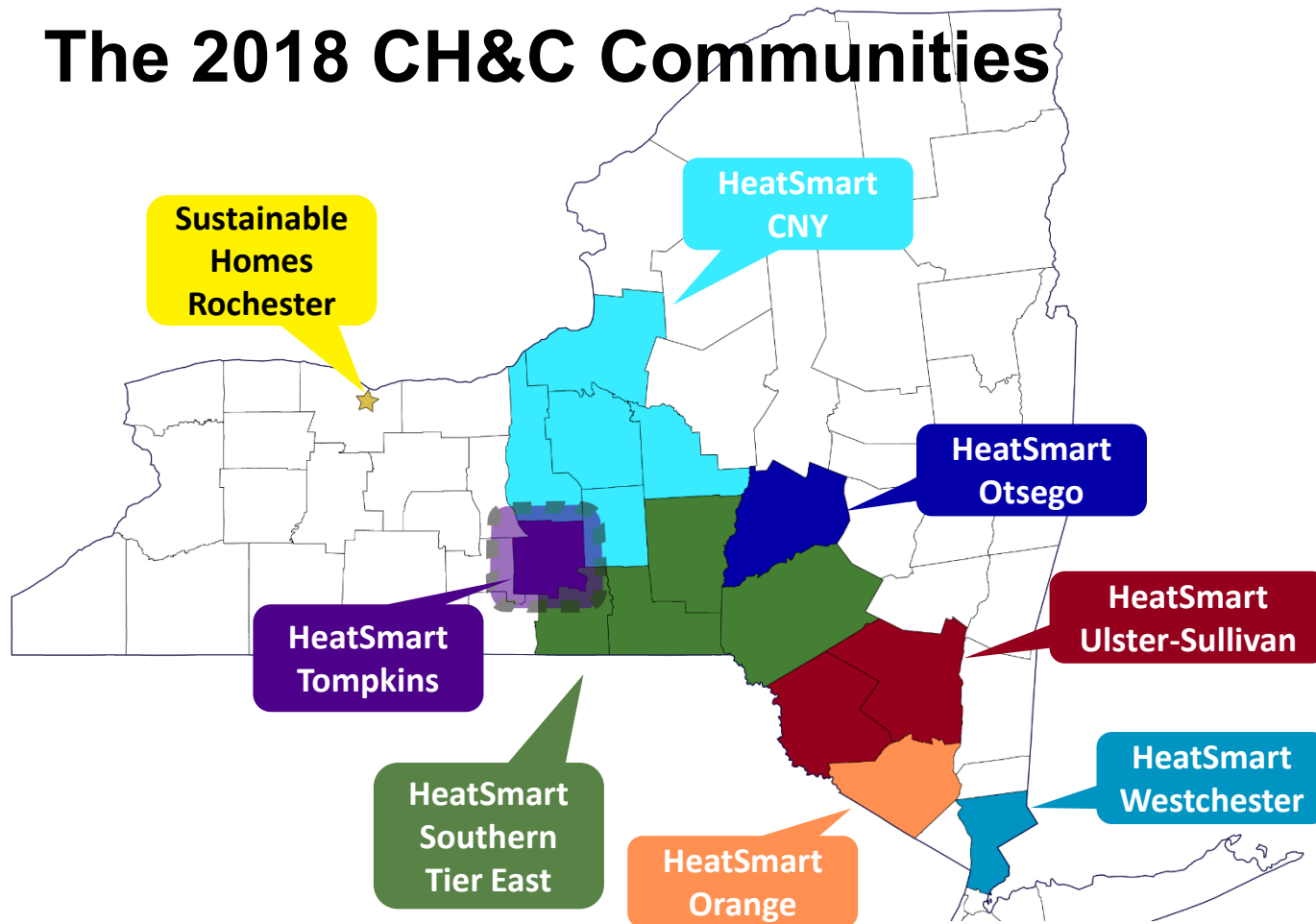
Round 1: Active CH&C Campaigns

Communities	Campaign Organizer
Sullivan and Ulster Counties	Catskill Mountainkeeper
Cayuga, Cortland, Madison, Onondaga and Oswego Counties	CNY Regional Planning and Development Board
Tioga, Broome, Chenango, and Delaware Counties	Binghamton Regional Sustainability Coalition
Orange County	Energy Improvement Corporation
Otsego County	Otsego County Conservation Association
City of Rochester	City of Rochester
Tompkins County (& bordering areas in contiguous counties)	Solar Tompkins
Westchester County	Sustainable Westchester

Round 2: Announcement coming soon

Round 3: Released Q2

The 2018 CH&C Communities



CH&C Technical & Financial Assistance

- **Geothermal Clean Energy Challenge [\$3.5 Million]**
 - NYSERDA and NYPA joint program
 - Identify best candidates for large, multi-building geothermal installations
 - Large commercial buildings/campuses
 - Screening & additional financial support
- **NextGen HVAC Technology Challenges [\$15 Million Available in 4 Rounds]**
 - Innovation challenges
 - Focused on improving performance & value proposition of current & next generation HVAC
 - Challenge Areas:

Round 1	Round 2	Rounds 3 & 4
Compressor-less HVAC	HVAC controls and control products	TBD
Ground Source Heat Exchanger	Advanced solutions for packaged terminal air conditioners (PTAC)	
Heat Pumps	Advanced solutions for packaged terminal heat pumps (PTHP)	
HVAC Controls		

- **Financing Solutions**
 - Green Jobs Green NY (GJGNY) Loan Program
 - Financial Solutions Market Research Study underway

CH&C Marketing, Awareness & Education

- **Cooperative Advertising & Training for CH&C Partners [\$2 Million]**
 - Objective: support advertising, special promotions and/or events, including training, for eligible HVAC technologies
 - Eligible participants: HVAC manufacturers, distributors/vendors, rebate program installers
 - Incentive: cost share up to 50 percent of the total cost for advertising, marketing & promotions, training
- **Marketing and Customer Acquisition**
 - Developing clean heating & cooling messaging with marketing consultants
 - Collaborating with utilities
 - Marketing and awareness campaigns in targeted areas
 - Marketing tool kit for communities & broader distribution
 - Developing customer targeting tool to identify high potential customers
- **Workforce Training**
 - Conducted: 5 installer, 6 architect and engineer and 2 inspector trainings
 - Developing comprehensive strategy to support market growth
 - Current constraints: drillers & heat pump project managers
 - Future supply chain

Existing Commercial Building Assistance

Flexible Technical Assistance Program (FlexTech)



Flexible Technical Assistance (FlexTech)

Provides credible, objective, site-specific targeted technical assistance and analysis to help customers make informed clean energy investment decisions that result in the implementation of clean energy technologies.

PON

1746

Application Deadline

December 31, 2019*

Sectors Served

Commercial, Industrial, Multifamily**

Participant Eligibility

Pay into electric Systems Benefit Charge (SBC), No similar study within last 3 yrs., Occupied for 1 yr. min.

Application Documents

CFA, FlexTech Application Form, Scope of Work including budget & schedule

**the program will continue beyond 2019*

*** for CHP, Energy Storage, Clean Heating & Cooling Systems ONLY*



NYSERDA

Flexible Technical Assistance (FlexTech)

Incentive

Premium CHP and Energy Storage: up to 75% cost share

Other projects: up to 50% cost share

Incentive Cap

Energy Storage: \$100,000

Any CHP & Other projects: lesser of \$500,000 or 10% annual energy costs

Eligible Study Areas*

- ✓ Energy efficiency technical analysis
- ✓ Energy master planning
- ✓ Industrial & process efficiency analysis
- ✓ Combined heat & power feasibility studies
- ✓ Energy storage feasibility studies
- ✓ Clean heating & cooling system studies
- ✓ Strategic energy management
- ✓ Retro-commissioning studies
- ✓ Data center efficiency analysis
- ✓ Energy advisor services
- ✓ Wastewater treatment studies

** restrictions apply. Refer to PON 1746, or contact NYSERDA with questions.*

NYSERDA FlexTech Contact

flextech@nyserda.ny.gov

Green Jobs/Green New York (GJGNY) Energy Studies

GJGNY Energy Studies

To provide subsidized energy studies to small commercial and not-for-profit entities in compliance with the Green Jobs/Green New York (GJGNY) legislation.

Expected launch date: Q1 2019

GJGNY Energy Studies

Energy studies will consist of an ASHRAE Level 1+ Audit including a high level walkthrough of the premise with calculations to present cost-effective financial metrics.

	<i>Small Commercial</i>	<i>Not-for-profit</i>
<i>Customer FTE</i>	<i>Cost-share per Building</i>	
10 FTE or less	\$100	\$100
Over 10 FTE and 50 FTE or less	\$250	\$250
Over 50 FTE and 100 FTE or less	\$500	\$500
Over 100 FTE	n/a	\$500

Customer Eligibility

Subsidized GJGNY energy studies will be available throughout New York State to:

- Small businesses with 100 full time equivalent (FTE) employees or less
- Not-for-profit entities (any size)
- Regardless of whether they pay into the System Benefits Charge (SBC)

NYSERDA GJGNY Energy Studies Contact

Mary Hatch

Mary.Hatch@nyserda.ny.gov

518-862-1090 x3212

Net Zero Energy

NYSERDA CFA Program

- **Net Zero Energy for Economic Development Program**
 - One stop service for incentives
 - Streamlined program requirements
 - Phased payments to match outlays
 - Multi-year program

Net Zero Energy for Economic Development

Support REDC & State Priorities

- Supports the local REDC Strategic Plan
- In an REDC stated Economic Cluster
- Supports State Priority Areas

Geographic Distribution

- Opportunity Available Statewide
- Long Island REDC- not required to pay the System Benefits Charge (SBC)
- All other REDCs- projects must pay SBC

Net Zero Energy for Economic Development

Net Zero Energy

- Net Zero Energy Performance
 - An energy efficient facility where the actual annual energy used on site is less than or equal to the on-site renewable energy produced
- Eligible Costs
 - Design, Energy Modeling, Energy Efficiency, Renewables, Heat Pumps, Electric Vehicle Charging, Battery Storage
- Process Loads

For more information...

Contact:

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(518) 862-1090 ext. 3004

Commercial New Construction Program

- Objective: To effect a permanent transformation in the way new and substantially renovated buildings are designed and constructed.

Omega Center for Sustainable Living – first Zero Net Energy building in New York State (photo courtesy Omega Institute)



Program Eligibility

- New Construction or Substantial Renovations (vacant 30 days)
- Pay System Benefits Charge (SBC)



Ground up, new construction



Substantial Renovation
(vacant 30 days)

Project and Technical Support

- NYSERDA Team



MacArthur Elementary School
Photo courtesy Binghamton City School
District

Three Levels of Support

- Level 1 – Plan Review and Recommendations
- Level 2 – Energy Modeling and Analysis
- Level 3 – Technical and Financial Support



Cornell NYC Tech Campus
Roosevelt Island New York City
Photo courtesy Cornell University

For More Information

<http://www.nyserda.ny.gov/new-construction>

MacArthur Elementary School

- Binghamton - 2017
- 129,000 SF
- Geothermal, ERV
- Budget-limited partial ZNE
 - PV Roof area only (50% of need)
- EUI = 21.7 (typ. school 48)
- Net EUI = 10



Ashley McGraw Architects
Photo courtesy Binghamton City School District

Skaneateles Village Hall

- Skaneateles – 2008
- Gut renovation
- REDGHG Communities
- 5470 SF (3860 SF w/o garage)
- GSHP, PV, Sol. Therm., LEDs, ERV, envelope
- EUI = 9.8
- Net EUI = (0.9)



Photo courtesy Village of Skaneateles

Cornell Bloomberg Center

- Roosevelt Island – 2017
- 150,000 SF
- \$105M
 - \$504K incr. cost exclud. GSHP, Solar
- Island-unique geothermal
 - Test wells revealed river-linked rock fissure
 - EUI = 30.9 (baseline 36.8)
 - Net EUI \approx 10 (assume 67% from PV)



Cornell Bloomberg Center photo credit Matthew Carbone for Morphosis

Omega Center for Sustainable Living

- First ZNE in NYS
- Rhinebeck - 2008
- 6200 SF
- \$4.1M
- Optimize orientation, GSHP, radiant heating panels, 200 PV panels
- EUI = 24.5 kBtu/SF/Yr
- Net EUI = (0.8)



Photo courtesy of Omega Center for Sustainable Living

Hudson Valley Clean Energy Headquarters

- An early CNCP ZNE project
- Rhinebeck – 2008
- 5470 SF
- GSHP, PV, Sol. Therm.
- EUI = 9.8 kBtu/SF/Yr
- Net EUI = (0.9)



Photo courtesy Hudson Valley Clean Energy

231 Main Street

- New Paltz – 2014
- 5400 SF
- Air Source HP, PV, ERV, Improved Envelope
- EUI = 45.2 kBtu/SF/Yr
- Net EUI = (7.5)



Photo courtesy Alfandre Architects

Thank You

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