NYSERDA Residential Market Advisory Group Q1 2025 Meeting

Single Family Residential, 02/27/2025

11:00 am – 12:30 pm ET

NEW YORK STATE | NYSERDA

The RMAG is a forum for stakeholder engagement on the residential market's highest-priority issues

Engagement Opportunities

- Quarterly Meetings (In-Person and Virtual)
- Working Groups
- Expert Panels
- Listening Sessions

Functions

- Advance residential clean energy and efficiency market development and innovation
- Iterate on programmatic design and implementation with stakeholder feedback
- Provide policy updates and relevant knowledge sharing for residential actors
- Foster NYSERDA clean energy and energy efficiency thought leadership

RMAG Objectives

- **Maintain market awareness** of public policies driving investments in energy efficiency and clean energy in the residential market.
- **Share information** on current and planned activities to enable coordination and avoid unproductive duplication of efforts in advancing progress towards policy and industry objectives.
- **Discuss opportunities and challenges** associated with wide-scale deployment of energy efficiency and clean energy services for the residential sector and seek solutions to overcome market barriers.
- Help **guide the direction** of the market's existing and future clean energy solutions.
- **Make connections** and **develop collaborations** among participants and partners to meet mutual objectives.
- **Develop and coordinate** shared messaging and outreach strategies where appropriate.

Meeting Agenda

Time (Eastern Time)	Topic and Presenter	Presenters
11:00 am – 11:05 am	Welcome and Introductions	• Tamar Nagel • Trevor Reddick
11:05 am – 11:25 am	NY State Updates: Post- State of the State	• Susanne DesRoches • Courtney Moriarta
11:25 am – 11:40 am	Multifamily Presentation	• Brian Cabezas
11:40 am – 12:20 pm	NY-GEO: Revaluing and Incentivizing Geothermal Heat Pumps	• Jens Ponikau • Kevin Moravec
12:20 pm – 12:30 pm	Closing and Next Steps	• Tamar Nagel • Trevor Reddick

Introductory Comments

Tamar Nagel

Residential Market Advisory Group Manager

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New York State Energy Research and Development Authority

50 YEARS 1975-2025

Residential Market Advisory Group

Q1'25 Opening Remarks

Susanne DesRoches, VP, Clean and Resilient Buildings

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New York State Updates

Courtney Moriarta, Director, Single Family Residential

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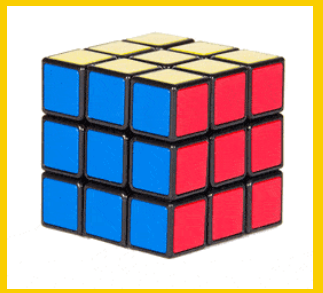
1975



MICRO SOFT

Our actions reduce greenhouse gas emissions, accelerate economic growth, and improve the quality of life for all New Yorkers.

- **Offshore Wind is generating energy**. New York State's first utility-scale project is online, generating clean energy for the grid.
- **Over 1 million New Yorkers** have participated in NYSERDA-supported programs
- **178,000 clean energy jobs** in New York State and growing.
- **$39 billion of clean energy investments** across the State since 2015.

5 BIGGEST LEARNINGS FROM NYSERDA'S TRACKING STUDY

Findings are from our 2023 Annual Statewide Tracking Study.
A representative sample of 2,886 New York State adults ages 18+ completed the survey.

As part of an Annual Statewide Study, NYSERDA seeks the opinions of New Yorkers on topics related to climate actions and clean energy solutions.

66%

EITHER STRONGLY OR SOMEWHAT **SUPPORT**

PUBLIC INVESTMENTS TOWARD MAKING CLEAN ENERGY SOLUTIONS MORE AFFORDABLE FOR ALL

62%

EITHER STRONGLY OR SOMEWHAT **SUPPORT**

THE STATE'S TRANSITION TO CLEAN ENERGY SOURCES

MORE THAN HALF

OF NEW YORKERS **SUPPORT**

LARGE-SCALE RENEWABLE ENERGY DEVELOPMENT – EVEN CLOSE TO HOME

LOW-INCOME HOUSEHOLDS ARE LESS FAMILIAR

WITH WAYS TO USE LESS FOSSIL FUELS WHEN COMPARED TO THOSE WITH HIGHER INCOME

26% OR 1 IN 4

EITHER VERY OR EXTREMELY **LIKELY**

TO CONSIDER AN EV FOR THEIR NEXT VEHICLE

EmPower+ Past Participant Heat Pump Survey

SURVEY OF EMPOWER+ PAST PARTICIPANTS, N = 109

EmPower+ participants who received heat pumps were surveyed

8 IN 10

ARE VERY SATISFIED OR EXTREMELY SATISFIED WITH THEIR HEAT PUMP

85%

SAY THEIR HEATING BILL IS LESS EXPENSIVE WITH THEIR HEAT PUMP, **65% SAY THEIR OVERALL ENERGY COSTS ARE LOWER**

4 IN 10

REPORT SAVING MORE THAN $500 ON THEIR ENERGY BILLS ANNUALLY

"My wife was concerned that it heats and cools. **It seemed counterintuitive.** Growing up, we were in homes that had two different systems. The fact that it was combined just didn't seem possible. **Would it be effective at doing both?"**

75% say the heat pump makes my home more comfortable

88% are "extremely satisfied" or "very satisfied" with the heat pump's ability to keep their home cool during the hottest days of the year

67% are "extremely satisfied" or "very satisfied" with the heat pump's ability to keep their home warm during the coldest days of the year

EmPower+ Participant Survey

N = 109

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COMFORT

“I was trying to get the house warmed up as much as possible for my 85-year-old mother. Some rooms were freezing even with the boiler on. When she said this heat pump would cover all her basic needs, **that’s what really lit up my eyes, my mother’s going to be okay**.”

CONVENIENCE

“For my entire lifetime we only heated with wood. **Wood is a real pain**. You have to stay on top of it. We have no way to keep the house warm when we are away. **This was an opportunity to upgrade**.”

PREDICTABILITY

“We moved from Long Island to Upstate NY during COVID. **We were unaware of the costs of propane** until we woke up one morning and it was freezing. We had run out of propane. That’s when we started looking into other options.”

EmPower+ Participant Survey

Interview Testimonials

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50 YEARS 1975-2025

WHAT'S COMING UP IN 2025

Residential Market-Based Initiatives

- **NYSERDA will be fielding the 3rd round of our Residential Building Stock Assessment**
- **We'll continue to build out features in MyEnergy.gov to engage with consumers**
- **A new virtual residential energy assessment will be developed and deployed**
- **We'll continue to support market enabling activities to accelerate adoption of heat pumps through Clean Heat Connect, Experience Clean Heat, and a new Business Consulting and Mentoring offer for contractors**

STAY CONNECTED AND INFORMED

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Keep up-to-date on NYSERDA programs, offerings, and information.

Visit our web page.

nyserda.ny.gov

Follow us on social.

Subscribe to our email list.

nyserda.ny.gov/subscribe

Sign up for texts.

Text ENERGY to 43494

• Together, we can make a difference.

Residential Market Advisory Group: NYSERDA Multifamily Update

February 2025

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Agenda

- **Upcoming Multifamily Programs**
- Owner's Representative Services
- Low Rise Multifamily Pilot
- **New Multifamily Contractor Network**

Owner's Representative Services:
What are we solving for?

- Building Owners/Managers not sure what should be their first step
- Building Owners/Managers complete FlexTech energy study, but need more assistance to take next steps to install recommended measures
- Attrition of projects in program pipeline due to challenges in managing projects
- Historically underserved buildings need more support to initiate or complete projects

Owner's Representative Services:
Overview (Launch in Q1/Q2 2025)

Qualified contractors will support owners through the implementation of decarbonization plans and act as a trusted, independent resource and support the interests and goals of the building owner.

Scope of services includes:

- Project planning
- Competitive bid process
- Capital stack guidance and analysis
- Communication and relationship management
- Construction oversight and cost management
- Project close out
- Other

Eligible Buildings:

- Meet DAC criteria
- Meet LMI criteria
- A condo or co-op; or
- <=50 units

Owners Representative Services:
Funding Breakdown

Contract and funding will be distributed to selected service providers.

- Cap per project: $35,000
  - 100% investment for initial $20,0000
  - Cost Share for remaining $15,000 - 75% for Affordable, 50% for Market Rate
- **Intake:** Owners will submit online application through JotForms. Applications will be reviewed by NYSERDA and then allocated to one of the selected service providers. Service Provider and Owner will develop SOW and submit to NYSERDA for review & approval.
- PON and Webpage will be posted shortly

Low Rise Multifamily Pilot

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Small Multifamily Buildings Underserved by Existing Programs

- **Building size underserved by existing programs**
  - 2-4 units buildings are underserved in Single Family programs
  - 5-19 unit buildings are underrepresented in Multifamily programs, since property management companies focus on larger properties to maximize savings. Contractors focus on larger properties that tend to receive larger incentive allocations.
- **Smaller properties can use existing residential contractor network**

Limit to buildings 1-3 stories above grade

- **Taller buildings present challenges for residential contractors**
- **Buildings above 3 stories:**
  - Fall under commercial provisions under NYS Building Codes
  - Would require retrofitting integrated sprinkler systems for older (pre-1979) properties per NYS Fire Code and NFPA Rule 13

Pilot Will Focus on 2-19 Unit, Low Rise Multifamily Buildings

- **Opportunities for targeting**
  - 19 unit maximum aligns with US Census bin structuring, and community and real estate datasets, allowing for easier customer targeting
- **Energy saving opportunity**

  75% of LRMF housing by county across state is pre-1980 and majority of housing stock pre-date state and national energy codes

  Majority of buildings 20+ units were built in the last 45 years and have less energy savings opportunity

Assumptions

- **Small multifamily buildings are under resourced and require one-on-one guidance and assistance**
- **Individual programs can be confusing – layering programs and coordinating multiple programs is a barrier**
- **Contractors may drive leads, but not always**
- **Build in flexibility – no building left behind**

Pilot Expected to Coordinate Across Programs and Players for One-Shop Experience

Small Affordable Multifamily Energy Study Program

Owner's Rep Program

Installation Contractor

Regional Clean Energy Hubs

Project Advisor

Details

- Pilot anticipated to launch in late Q3/early Q4
- Timeline is 12 months
- Learnings from Pilot to help inform future multifamily programs that serve this sector

Multifamily Residential Energy Pathways Network

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New - Multifamily Residential Energy Pathways (MREP) Participating Contractor Network RFQL 5906

Establish a network of highly qualified firms who work directly with developers, building owners, and their representatives to plan and implement energy efficiency and beneficial electrification projects for Multifamily Residential programs

- Create a more robust network of contractors
- Simplified, centralized approach for customers
- Replaces Multifamily Building Solutions Network

MREP Participating Contractor Network

New Contractor Network will be composed of various service categories

Service Categories	Service Subcategories
Technical Assistance	Energy Assessor
Installer	ASHP Installer
	GSHP Installer
	Direct Exchange GSHP Installer
	Electricians
	Plumbers
	General Contractors
	Insulators – Shell/Envelope
	Insulators - Window/Insulated Panel/Storm Window

Contractor Application – Full or Shortened

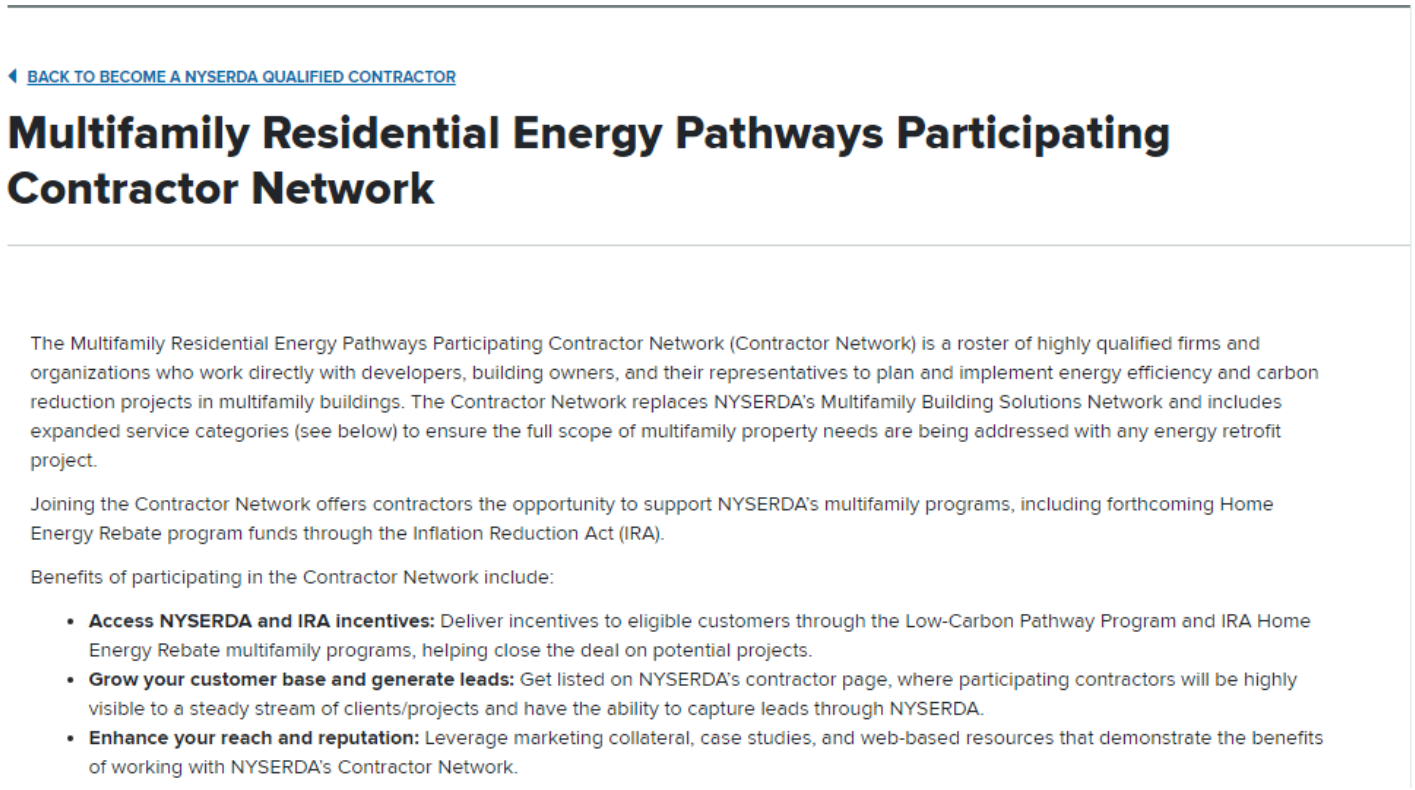
- **Full Application** – Similar to the MF Building Solutions Network
- **Shortened Application** – Does not require case studies, customer references, technical expertise documentation.
  - **Eligibility -** Providers in good standing that joined one of the eligible networks in past 3 years or had a project complete construction in MPP, AMEEP, WAP or LCP since then are eligible. Will be asked for documentation to confirm they meet this status.
    - **Eligible networks**
      - MF Building Solutions Network
      - Comfort Home Contractor
      - EmPower+ Contractor
      - FlexTech Consultant
      - NYS Clean Heat Participating Contractor
      - AMEEP Participating Contractor
      - WAP Subgrantees
      - HPD Pre-Qualified Vendor
      - NYC Accelerator Service Provider
      - NYCHA PACT Developers and General Contractors

Benefits of Being in Network

- **Access NYSERDA Incentives: Eligible to submit applications for programs under Multifamily Residential Energy Pathways**
- **Build Skills & Network: Quarterly webinars with program updates and presentations on emerging technologies, market insights**
- **Grow Customer Base: Inclusion on Find a Contractor page for visibility and to generate leads**
- **Enhance Reach & Reputation: Access marketing collateral, case studies and web-based resources**
- **Tap into Technical Assistance: Utilize Energy Use Snapshot, NYSERDA's baselining services, for eligible projects (detailed in program materials)**
- **Offer Feedback on Program Design: Share feedback with NYSERDA program team to inform future program design**

For more information

Website: nyserda.ny.gov/multifamilycontractornetwork
Email: mrepnetwork@nyserda.ny.gov



BACK TO BECOME A NYSERDA QUALIFIED CONTRACTOR

Multifamily Residential Energy Pathways Participating Contractor Network

The Multifamily Residential Energy Pathways Participating Contractor Network (Contractor Network) is a roster of highly qualified firms and organizations who work directly with developers, building owners, and their representatives to plan and implement energy efficiency and carbon reduction projects in multifamily buildings. The Contractor Network replaces NYSERDA's Multifamily Building Solutions Network and includes expanded service categories (see below) to ensure the full scope of multifamily property needs are being addressed with any energy retrofit project.

Joining the Contractor Network offers contractors the opportunity to support NYSERDA's multifamily programs, including forthcoming Home Energy Rebate program funds through the Inflation Reduction Act (IRA).

Benefits of participating in the Contractor Network include:

- **Access NYSERDA and IRA incentives:** Deliver incentives to eligible customers through the Low-Carbon Pathway Program and IRA Home Energy Rebate multifamily programs, helping close the deal on potential projects.
- **Grow your customer base and generate leads:** Get listed on NYSERDA's contractor page, where participating contractors will be highly visible to a steady stream of clients/projects and have the ability to capture leads through NYSERDA.
- **Enhance your reach and reputation:** Leverage marketing collateral, case studies, and web-based resources that demonstrate the benefits of working with NYSERDA's Contractor Network.

Multifamily Residential Resources

Program Webpage

Email List

Please email multifamilyinfo@nyserda.ny.gov for additional questions

NY-GEO Introductions

John Rath

It is the peak KW, not the average KWH, which matters !

Jens Ponikau CGD

President, New York Geothermal Energy Organization

Buffalo Geothermal LLC

BUFFALO GEOTHERMAL HEATING™

www.BuffaloGeothermalHeating.com

NY-GEO

Heat Pump Assessment Study – an EPRI Report

New York ISO
Independent System Operator

Load Forecasting Task Force
December 19, 2022

TRNSYS simulates the behavior of transient systems

Model home 2,600 sqf house in Albany

Average COP was 2.30 at design conditions in Albany

At -3°F the COP was 1.12 (incl. supplemental heat)

Supplemental power is required when demand exceeds 6 kW.

17.53 KW peak demand

Field study confirms NYISO modeling (Cadmus Study)

Average Heating Performance, COP 2.25

Average Outside Air Temperature, 17.2 °F

Average Site-Metered Demand, 2.77 kW

Maximum Site-Level Demand (2-min interval), kW 17.25

“Note that electric resistance demand is not included in the calculation of ducted system performance shown in this table.”

https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/PPSER/Program-Evaluation/Residential-ccASHP-Building-Electrification-StudyAugust-2022.pdf

Field study confirm NYISO modeling (Hudson Valley Study)

Average Heating Performance, COP 2.1

the average efficiency was about 63% of the rated efficiency

All sites used supplement heat

Peak demand was not measured

https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/PPSER/Program-Evaluation/22-08-Hudson-Valley-Heat-Pump-Pilot-Project-complete.pdf

New Efficiency: New York Analysis of Residential Heat Pump Potential and Economics

Final Report | Report Number 18-44 | January 2019

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Table 4-3. 2018 Statewide Residential and Commercial Thermal Load (Space Heating and Cooling)

End Use	Statewide Residential & Commercial Load (TBtu)
Space Heating	557
Space Cooling	221
Total	778

New Efficiency: New York

Analysis of Residential Heat Pump

Table 2.2 - FLH Appropriate for Use with GSHP Nominal Capacity	
Albany	1,345
Binghamton	1,534
Buffalo	1,415
Massena	1,469
New York (LGA)	1,222
Poughkeepsie (Newburgh)	1,350
Syracuse	1,412

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Statewide weighted average EFLH = 1,321

BTU to Watt conversion factor = 3.412

Heating load = 557 TerraBTU

Peak Load = 557,000 Giga BTU/(3.412 x 1,321)

= 123.58 Giga Watt

- Without the hot water load
- Without Process heat
- Without EV charging

NYISO issued the *2021 – 2040 System & Resource Outlook (NYISO Powertrends 2023)*

"*The Outlook* concludes that unprecedented levels of investment in generation will be necessary to reliably deliver sufficient energy to meet future demand.

***The Outlook* concludes that by 2040 New York's grid would need the following to reliably meet the goals of the CLCPA and expected peak demand:**

111-124 GW of generating capacity, or roughly three times the current capacity connected to the system.

27-45 GW of this capacity must be from non-emitting resources capable of performing like today's fossil fuel-fired generation fleet depending on the scenario. It is especially important to note that commercially available technologies to provide dispatchable, non-emitting supply do not exist at scale at this time. "

Requirements for Future Heating System

1) The heating system's efficiency and capacity must operate independent of the outside temperature

2) It must cover the full load without supplement resistance heat.

3) It must not only reduce the heating but also the significantly the cooling load.

4) It must make all the domestic hot water without electric resistance heat.

ZerOPlace

New Paltz NY

Mixed use, Net-Zero Energy Building:
63,320sf (2020 Completed)

46 Residential Apts (55,780 sf)

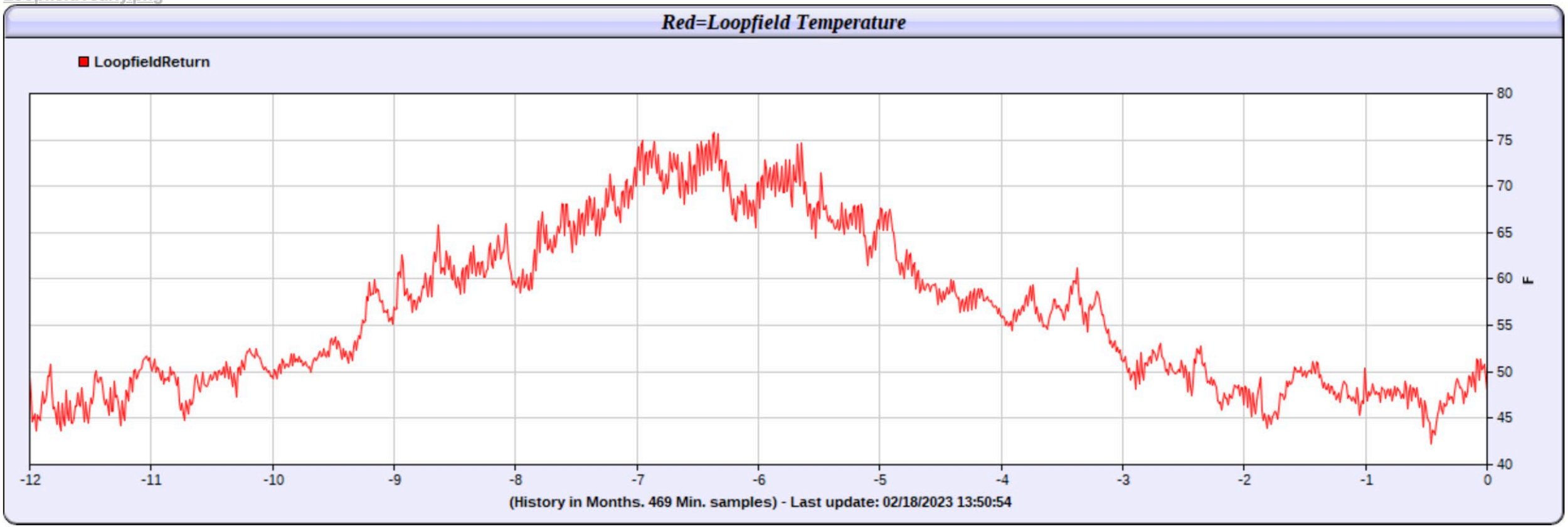
6 Retail spaces at Ground Flr (7,540sf)

https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/Research/Other-Technical-Reports/24-37-ff.pdf

12 Month Annual Entering Water Temperatures 2/18/2022 -2/18/2023 Thermal Battery Zero Place

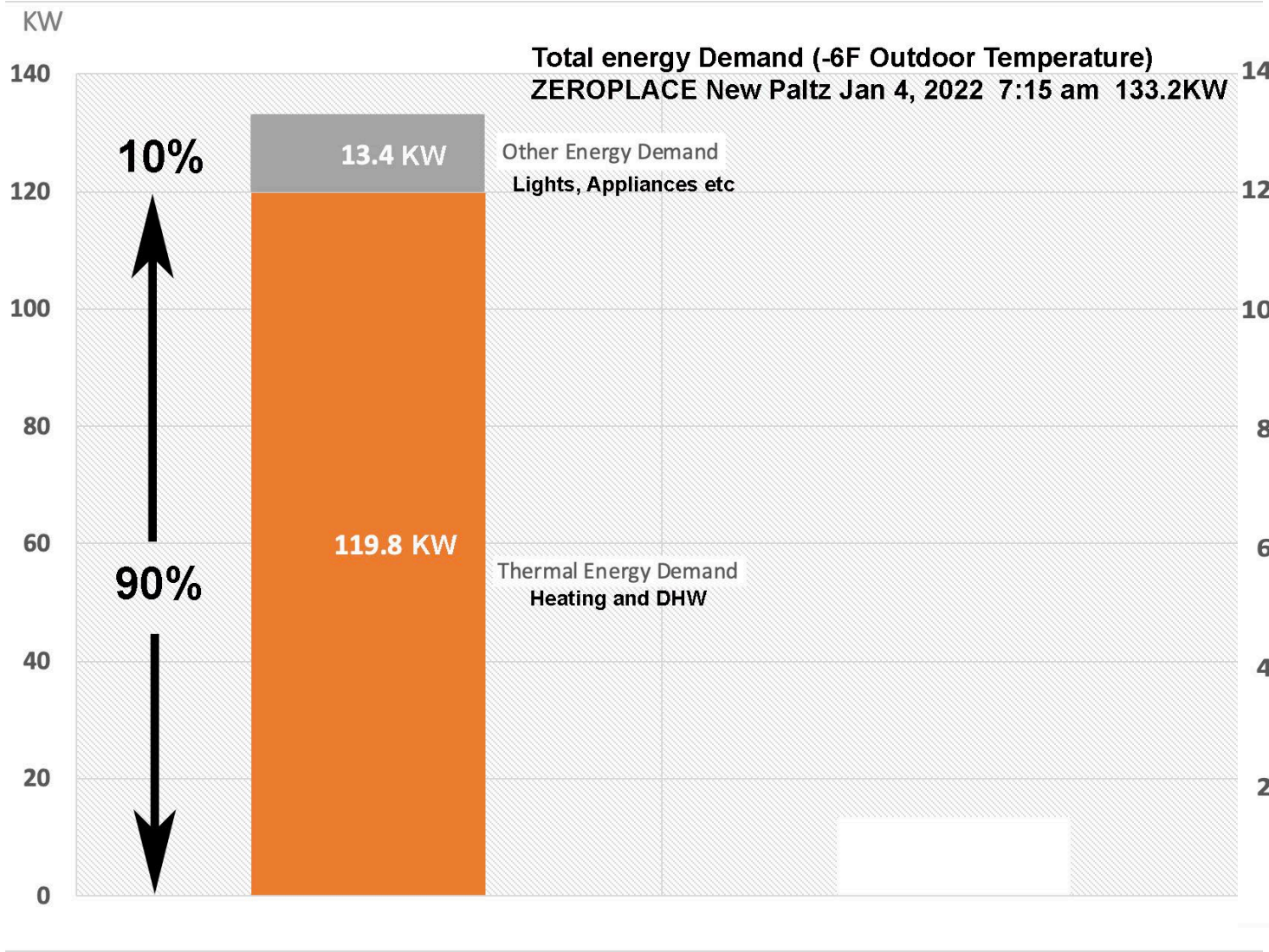
- Heating up the ground
  - Storing summer A/C rejection in the ground
  - Reusing it in the winter

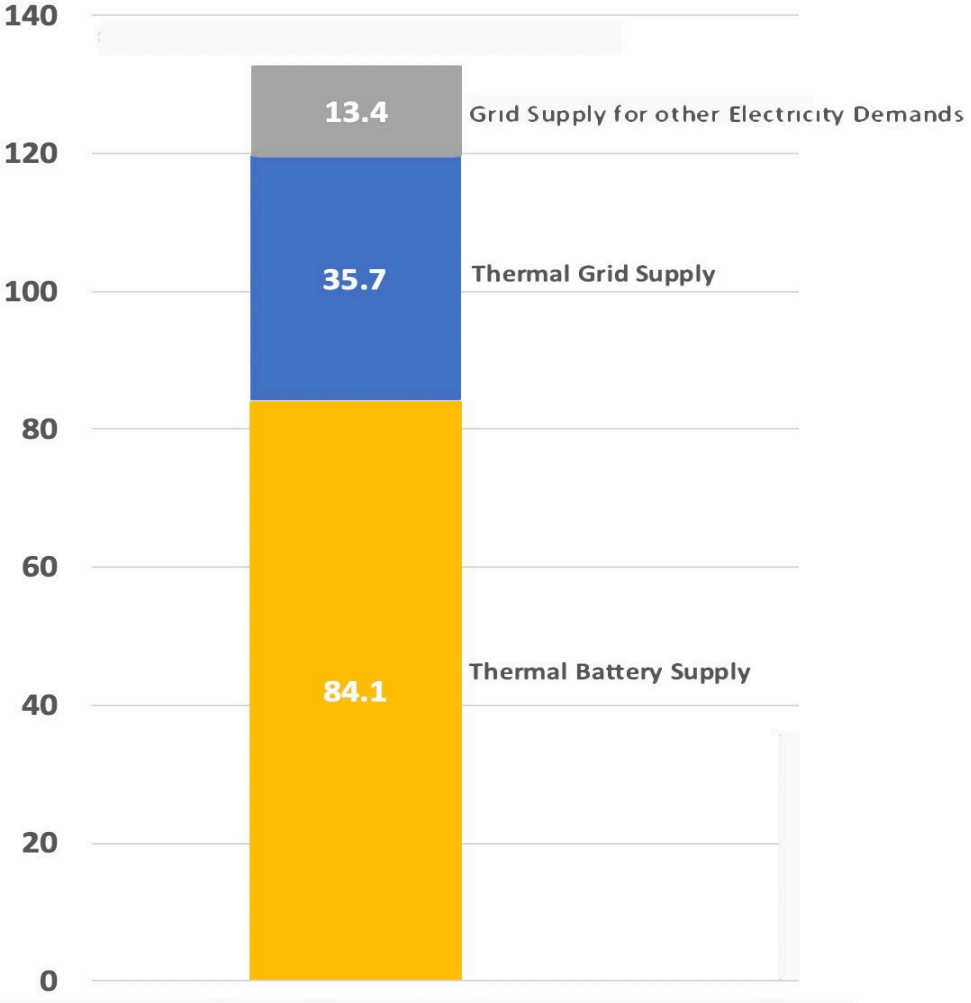
LoopfieldYearly.png



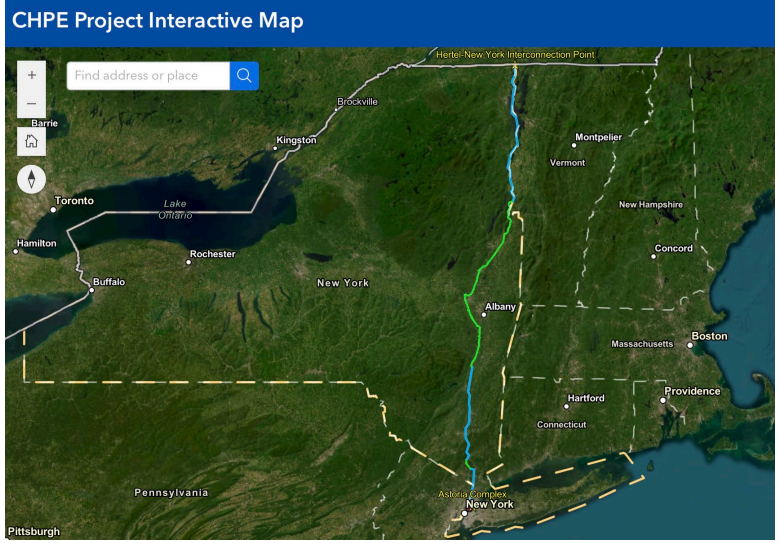
Peak Demand Energy Use
(15 min utility demand)

90% of the entire energy load of the building was DHW and heating (Thermal Load)





Examples of grid capacity costs



- The Champlain Hudson Power Express (CHPE)
  - 1.2 Gigawatt capacity
  - $6 Billion costs
  - $ 5,000 /KW for transmission line only
    - This does not include cost of power or distribution
    - Contract is only for the summer, since Quebec needs it for the winter heating

- Off-Shore wind $3 billion for 810 MW capacity (Empire Wind 1, Jan 2025)
  - $ 3,708/KW (capital cost)
  - Plus $9.3 billion to operate and finance it over 25 years (Net Present Value $1,020/KW)
    - https://newatlas.com/energy/nyc-3-billion-offshore-wind-farm/

- The utility distribution costs $2,500-$3,500 per KW capacity
  - Pan-Am building in Buffalo NY (new build 150 apartments) required additional feeder line due to air source heat pumps ($5M = $33,000 per apartment)

ZeroPlace Loop Field Thermal Energy Delivery avoided 24h storage capacity

Monetary Value @567/kWh*

Peak Day (Feb 4)		1,706.81	kWh	$ 967,762

*"Among projects awarded NYSERDA incentives, average total installed costs for non-residential, retail projects av
$567/kWh for installations occurring in 2022 and 2023"
Case 18-E-0130 – In the Matter of Energy Storage Deployment Program.
New York's 6 GW Energy Storage Roadmap Policy Options for Continued Growth in Energy Storage.pdf

Cost of the entire Loop Field at ZeroPlace (Thermal Battery) $390,000

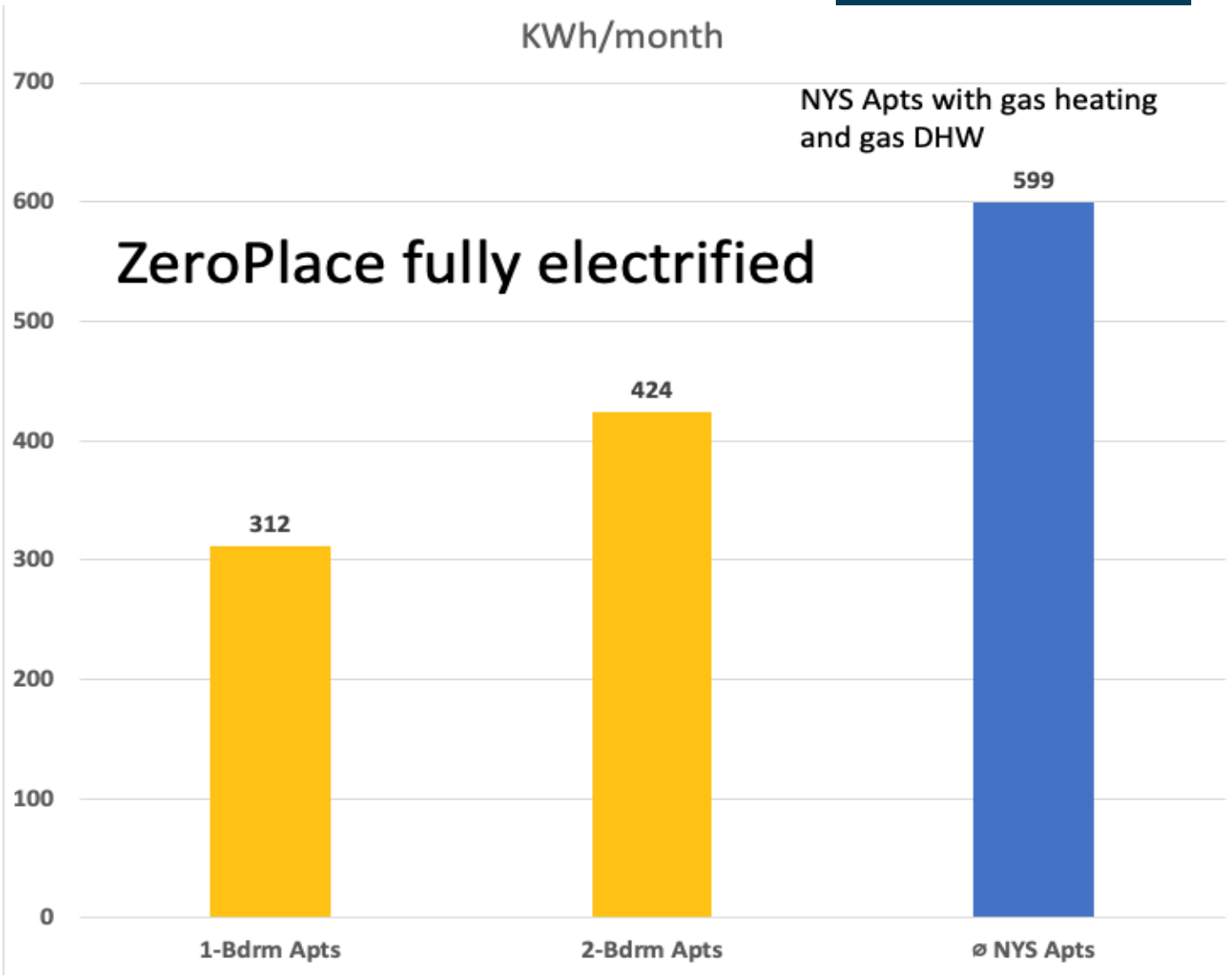
Examples of grid capacity costs $390,000 Thermal Ground Battery compared to Electric Resistance (COP=1) or ASHP (COP=1.12 (NYISO simulation)

- The Champlain Hudson Power Express (CHPE) transmission line
  - 84.1 KW x $5,000/KW = $420,500
  - ASHP (84.1 KW / 1.12 COP) x $5,000/KW = $375,450

- Electricity generation savings (Empire Wind 1, Jan 2025)
  - 84.1 KW x $4,728/KW = $397,625
  - ASHP (84.1 KW / 1.12 COP) x $5,000/KW = $375,450

- The utility distribution costs $2,500-$3,500 per KW capacity
  - 84.1 KW x $3,000/KW = $252,300
  - ASHP (84.1 KW / 1.12 COP) x $3,000/KW = $225,268

Average electricity usage per Apartment (inclusive of all space conditioning and central DHW)



Heating Peak

Feb 4th 2023, 7:30-7:45 am

- *Outdoor Temp = -6°F*
- *All WSHPs = 29.3 kW*
- *DHW HPs = 2.8 kW*
- *Loop Pumps = 0.45 kW*
- *Building = 43.8 kW*

Cooling Peak

July 28th, 2022 5:00-5:15 pm

Outdoor Temp = ~95°F

All WSHPs = 28.5 kW

DHW HPs = 0.0 kW

Loop Pumps = 0.50 kW

Building = 43.5 kW

Conclusion

The ground is capable of supplying 70% of the needed generating capacity, over 123 GW in NYS

Geo system installation can achieve immediate passive house standard
Even in retrofit installations without significantly improving the envelope

Geo is the only choice we have to reliable deliver sufficient energy for Heating (at any cost) to meet the CLCPA goals, no other technology is available onsite.
Automatically dispatched emission free thermal energy from the thermal ground battery

What we get from the Ground, we do not have to get from the Grid !

Electrifying Existing Buildings: The Role of Incentives

Kevin Moravec

NY-GEO Board Member

President, VanHee Mechanical

Barney Moravec, Inc. (yes, I'm a driller too....)

Weatherization vs Electrification
Use of Variable Capacity (VC)

Loop field costs are not “PER TON” or “PER FOOT” – typically they are standard

Heat Pump costs are not massively different between 3-5 ton units (ASHP or GSHP)

Industry has access to VC Forced Air, Hydronic AND Mini Split units (ASHP or GSHP)

“Cost Savings” to reduce from a 5 ton to a 4 ton is roughly $1,200 on average (vertical can be slightly higher due to market/site conditions)

Current Rebate Structure means pricing does not change to customer

If a customer has limited dollars to begin with, it becomes a choice – weatherize or electrify

How about those electric Rates!!!

Incentives to Grow Geothermal (the Dirt)

Incent the thing that makes Geothermal Go – the Ground, otherwise it's just a heat pump – The loop is the only thing that insulates customers from rate increases

The loop is the part that takes the most varied and highly skilled workers to install – especially drilling

All utilities know their cost for a new gas connection – apply that directly to the loop contractor for installing a new loop – $10-20k – immediately reduces OOP for contractors/homeowners

Communal/TEN can be a method BUT they come with a MUCH higher cost per unit installed as opposed to the loop per single family home. Interconnection of homes requires a massive amount of additional work – pipes/pumps/maintenance/redundancy/failure points.

Workforce Development – The more loops we put in, the more companies will hire and train – a qualified driller can make upwards of $150k plus Benefits

Why can we focus on Electrification 1st?

Methods of installation have changed in the last 5-10 years
Standardized Loop field, Variable capacity, DHW

Pricing has changed – Standardization has lowered labor costs
Equipment costs have risen, drilling costs have risen
Rebates have levelized pricing across a range of capacities

Monitoring gives us proof of concept and accountability
1 Package fits most (single bore, single unit) – 30-60kbtu homes (95% of projects)
Symphony gives us real-time and yearly energy usage (no time for this presentation)

We know that variable capacity systems are the best use of dollars relative to any other investment by any metric

Variable capacity allows for future envelope improvements (compressor turns down to match smaller load)

Electrification of a home IS permanent – 100% carbon avoidance

Peak Avoidance!!! This is the biggest impact to electric side

Department of Energy – Average Savings and Cost

U.S. DEPARTMENT OF ENERGY

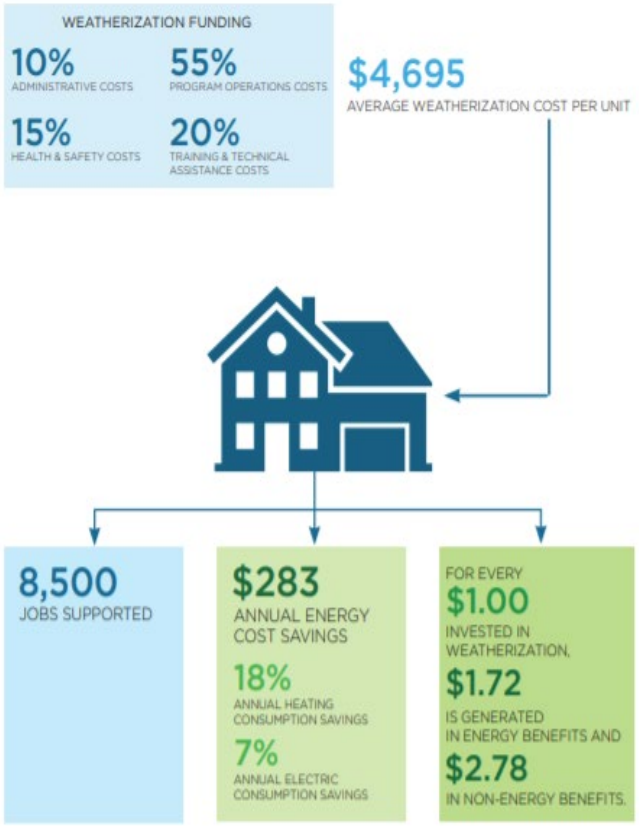
Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

Weatherization Works!

The U.S. Department of Energy's (DOE) Weatherization Assistance Program reduces energy costs for low-income households by increasing the energy e ciency of their homes, while ensuring their health and safety. The Program supports 8,500 jobs and provides weatherization services to approximately 35,000 homes every year using DOE funds. Through the weatherization improvements and upgrades, these households save on average $283 or more every year (*National Evaluation*).

Weatherization In Action

Locally-based and professionally trained weatherization crews use computerized energy assessments and advanced diagnostic

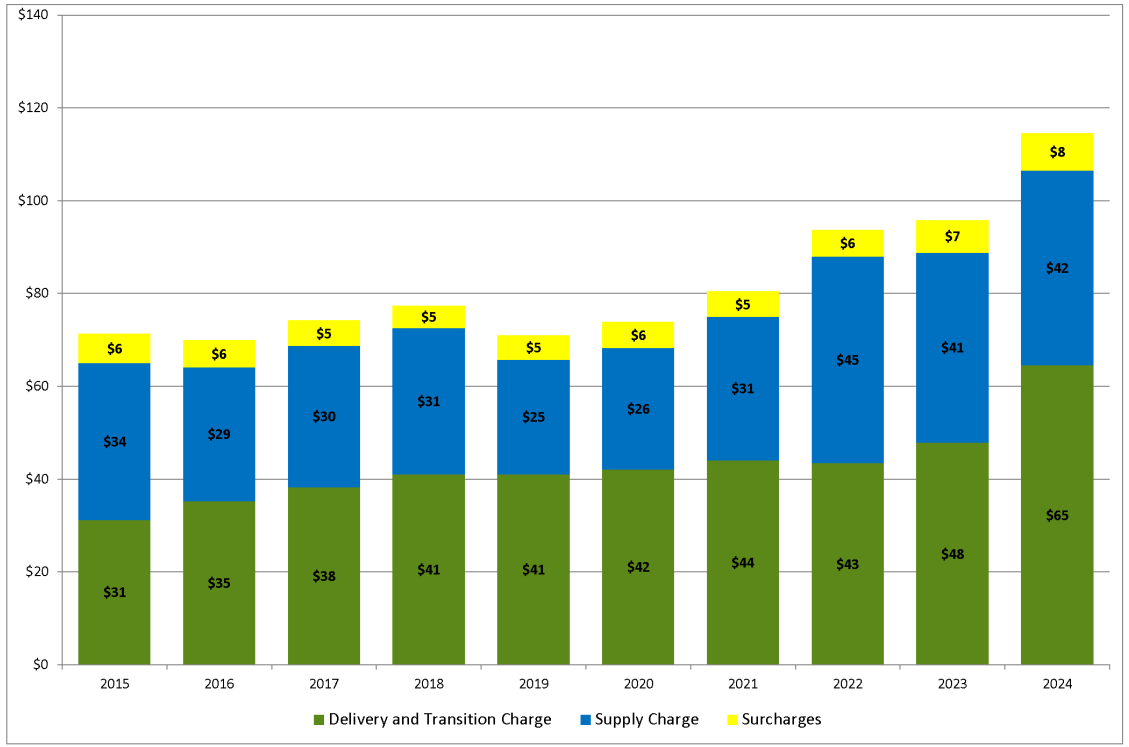


$4,700 average cost per Unit
$283 per year average savings
16.6 year average payback
18% average savings per unit

18% savings on 97mmbtu home
= 79.5mmbtu overall
17.5mmbtu savings = roughly
$164 in savings @ $.94/therm

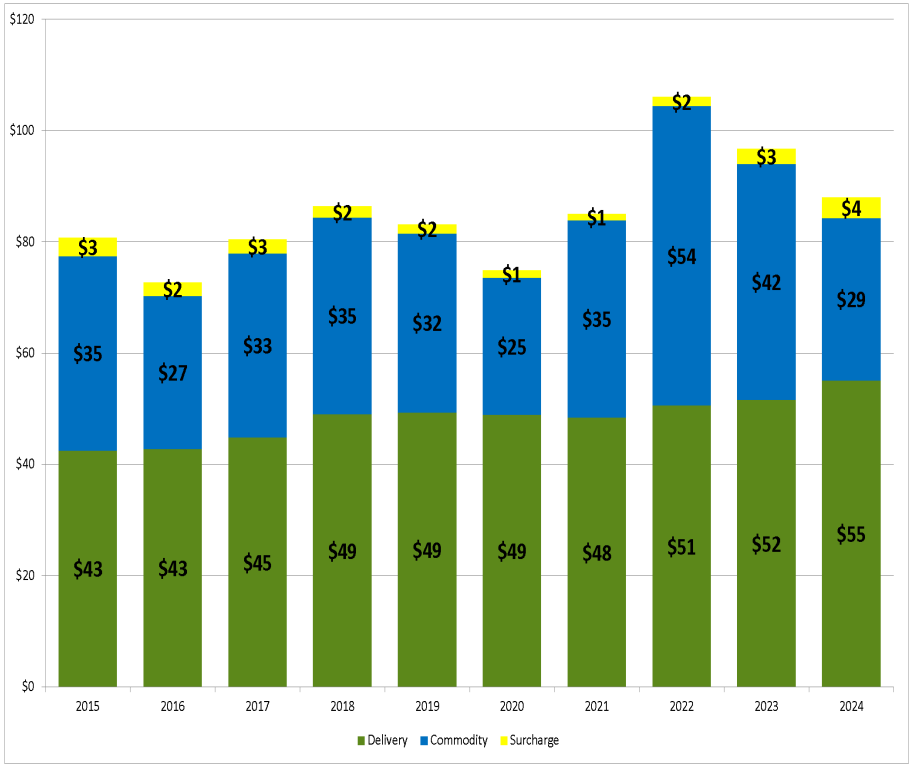
NYSEG Rates – Electric vs Gas – 10 Year History

NYSEG Electric – 600kwh/month - $.11 in 2015 to .19 in 2024



https://www.nyseg.com/w/residential-electric

NYSEG Gas – 1,000 Therms Annually - $.97/Therm in 2015, $1.056/Therm in 2024



https://www.nyseg.com/w/residential-gas

Sizing Example – How do we impact load and homeowner costs

Seasonal Heat Load of Home	Gas at 90% Efficiency		Cost @1.88/Therm	Savings at 20/40% Reduction in Load	If the goal is to reduce Gas usage, extend the life of the grid - we understand why this is of high value but it's pushing today's problems into the future!
100,000,000	111,000,000.00	Purchased BTU	$2,086.80		
80,000,000	88,800,000.00	Purchased BTU	$1,669.44	$417.36	
60,000,000	66,600,000.00	Purchased BTU	$1,252.08	$834.72	
*In order to supply 100mmbtu, need to buy 111mmbtu with 90% efficiency					

Seasonal Heat Load of Home	GSHP Savings/Cost			Savings at 20/40% Reduction in Load	
	Convert to KWh	Geo at 3.8 COP	Cost at $.24/KWh		
100,000,000	29,308.32	7,712.72	$1,851.05	$235.75	Savings vs Nat Gas
80,000,000	23,446.66	6,170.17	$1,623.73	$227.32	Reduce from 5 to 4 Ton
60,000,000	17,584.99	4,627.63	$1,110.63	$740.42	Reduce from 5 to 3 Ton

Seasonal Heat Load of Home	ASHP Savings/Cost			Net Savings due to 20% Reduction	
	Convert to KWh	ASHP at 2.2 COP	Cost at $.24/KWh		
100,000,000	29,308.32	13,321.97	$3,197.27	-$1,110.47	Savings vs Nat Gas
80,000,000	23,446.66	10,657.57	$2,557.82	$639.45	Reduce from 5 to 4 Ton
60,000,000	17,584.99	7,993.18	1,918.36	767.35	Reduce from 5 to 3 Ton

Every Million BTU's saved only saves a small % once a home is converted to electric
The biggest "Bang for the Buck" is eliminating fossil fuel. NG vs ASHP is an exception typically (operating cost). Carbon avoidance is 100% no matter what heat pump goes into the building.
*All rates from NYSERDA Site/reports – NYS Average

Pricing Exercise

Variable Capacity Geothermal System

Average Cost of $23,000-28,000 after incentives
Forced air, Hydronic, Geothermal Mini Split

Saves homeowners 20-30% vs Nat Gas/AC

Saves close to 70% operating costs vs Propane/Fuel Oil

100% removal of fossil fuel in the home.....FOREVER

Heat Pump has 25yr life expectancy

Ground loop replaces fossil fuel FOREVER

Properly designed systems will not need Aux KW

Variable Capacity ccASHP

Average cost of $15,000-20,000 after incentives (whole house solution)
May require fossil fuel or KW backup

Cost more vs Nat Gas, eliminates carbon

Cost to insulate/air seal - $10,000-15,000
A lot of customers see this in form of “free money” through weatherization programs

Saves around 47% vs Fuel Oil/Propane

Heat Pump has 15yr life expectancy

Geothermal – The real story

Cost – Everyone wants to discuss

Heat Pumps – $15-25k to homeowner – tonnage does not change this much ~$1,500 difference between 3 and 5 ton

Loop - $12,000-$20,000 – Vertical/Horizontal – Casing can matter – not much with standard loop

Install/Profit - $10,000-20,000

Incentives currently work for the "box" 5 ton System ranges between $7500-25,000 depending on utility

25% NYS – Up to 5k

30% Federal – uncapped after utility rebate

$60,000 High End System nets at around $26,000

Pricing is average of Western NY Geothermal Installers – holds accurate into Albany, Downstate is more expensive

What if…..

Utilize Weatherization programs as an Either/Or option
Why not allow that $10-15k for air sealing/insulation to be used for a Ground Source Heat Pump Installation – Best Bang for the Buck!

The loop was incentivized
What if the loop was incentivized the way air sealing/insulation/heat pump boxes were?

What if ALL of it Happened? – All money being spent currently in NYS

$60,000 Installation – best system, vertical closed loop

10-15K Loop – incents drillers to invest in this business

10-15k Reduction credit (weatherization) – eliminate gas and peak KW

10k Heat Pump Credit – We already do this

$30,000 Out of Pocket before tax credits, $16,000 after incentives (high end)

$20,000 Out of Pocket before Tax Credits, $9,000 after incentives (low end)

Questions?

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Thanks!

VANHEE Mechanical

MORAVEC GEOTHERMAL

NY-GEO

Thank you for your input!

These discussions help ensure that Single Family Residential program funding and co-benefits flow to all eligible NY residents as smoothly as possible through thoughtful program design and robust community outreach.

> Initial Stakeholder Sessions

- Residential Market Advisory Group
- Community Stakeholders Workshops
- Participating Contractors Workshops
- Public Input Webinars

> We Encourage Continued Input on NYSERDA Residential Programs:

- Send written comments to resmarket@nyserda.ny.gov at any time

> Upcoming Stakeholder Engagements and Working Groups:

- Utility Collaboration
- Multifamily Market Partners and Affordable Housing Providers
- Contractors & Outreach Partners
- Retailers
- Product Manufacturers
- Others as needed