NYSERDA Large Buildings Decarbonization Panel

Moderator: **Michael Reed/ *NYSERDA***

Speakers: **Patrick Fitzgerald/ *NYSERDA***

Vibhor Dutt/ *NYSERDA*

Alexander Jahn/ *NYSERDA*

New Construction

Building Market Demand

Buildings of Excellence Competition (BOE)
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Building Better Homes Program (BBH)
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NY-GEO Brooklyn
October 23, 2024

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Buildings of Excellence Competition
for Demonstration Projects

Buildings of Excellence Competition (BOE) selects multifamily demonstration projects that will be:

- Clean and resilient, emission free, beautiful, and functional buildings that will provide healthy, safe, comfortable living spaces for their occupants.
- Provide project data, including the incurred costs for constructing the awarded projects, as well as the predicted and measured energy performance.
- Round 5 closed September 18, 2024

For more information and lessons learned visit:

- Winners of the Four Rounds of the Competition
- Project Cost Data, Best Practices for Design and Construction of Multifamily Buildings, and more

Image Credit – THINK! Architecture & Design

Buildings of Excellence Competition

47
are majority affordable housing

37
in disadvantaged communities

12
committed to using geothermal systems for space conditioning

46
committed to Passive House certification

65
projects awarded

120
proposals submitted

34
Are 8+ stories

32
in construction or completed

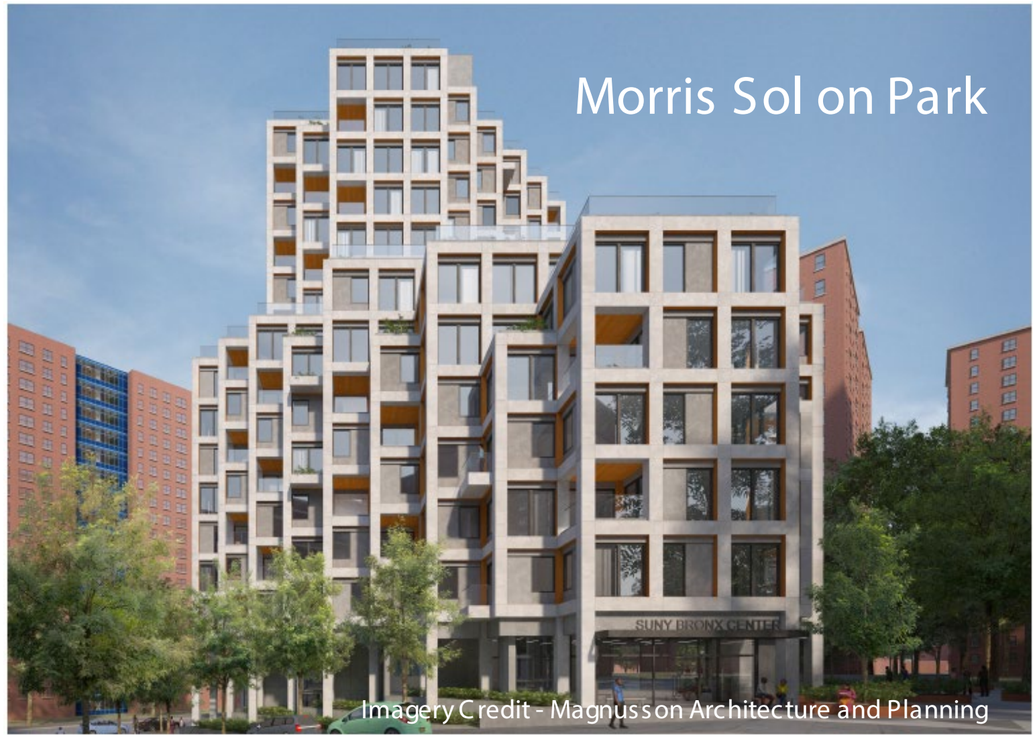
Buildings of Excellence
Early Design Support

Market Development Goals:

- Build the practice of design firms in the clean, resilient, and carbon neutral space
- Implement scale and replicability
- Reduce upfront risks that design firms may face by injecting funding at the very early design phase when decisions are being made
- Build developer confidence in carbon neutral projects

Design Partners provide early design support for:

- In-depth carbon neutral research and design
- Additional energy modeling and economic analyses
- Investigating third party standards and certifications
- Facilitating an integrated design and construction process
- Completing a more robust promotion and publicity plan



Imagery Credit - Magnusson Architecture and Planning

Building Cleaner Communities Competition

Clean and Resilient Buildings and Communities

- Targeted sector: Commercial, Light Industrial and Institutional buildings, including large-scale, multi-building projects
- Supports economic development priorities for the region or the State, including benefits to disadvantaged communities
- Encourage projects that provide supportive or essential services to the community
- Enhanced incentives for incorporating geothermal
- New Construction and adaptive reuse

Buildings Cleaner Communities Competition

23
in disadvantaged communities

5
committed to using geothermal systems for space conditioning

13
committed to Passive House certification


Cornwall Social

48	20	20	8
projects awarded	New Construction	Adaptive Reuse	Expansion, Upgrades or planning

Building Better Homes Program

Zero Emission Homes for Healthier Communities

Building Better Homes Program:

- Marketing, promotion, design and training associated with
- New construction of clean and resilient, emission free, beautiful, and functional single-family homes and townhomes that will provide healthy, safe, comfortable living spaces for their occupants.
- Enhanced incentives for projects that incorporate geothermal

Lessons Learned specific to GSHPs

Geothermal Impacts

- Covid-related supply chain constraints and increased costs imposed significant challenges.
- Increased building envelope performance pays significant dividends for emissions-free buildings.
- Recent feedback from developers interested in GSHPs indicate that the IRA-based tax credits are the tipping point for underwriting systems. (particularly true for systems smaller than 285 tones)

Flexible Technical Assistance (FlexTech) PON 4192

What is the FlexTech Program and who is it for?

- Cost-shared technical assistance
- Commercial, Industrial and Multifamily customers

Eligible Sectors withing FlexTech

Commercial

- Commercial Real Estate/Office Buildings
- Hospitals/Healthcare
- College & University
- P12 Schools
- Municipal Buildings
- Non-Profit
- Retail
- Stadiums/Theaters

Industrial

- Industrial Parks
- Manufacturing Facilities
- Wastewater Treatment Plants
- Data Centers

Multi Family

- 5+ Residential Units

Study Types under FlexTech

- Comprehensive or Targeted Energy Studies
- Energy Master Planning
- Retro Commissioning Analysis
- Indoor Air Quality Analysis
- Large Scale Thermal Analysis

Large Scale Thermal through FlexTech

Definition

- Uses heat-pumps and low carbon thermal resources, such as ground, surface water, wastewater, waste heat, and thermal storage, to provide heating, cooling, and hot water to one or more buildings.

- Single Buildings
  - Heat pumps

- Multiple Buildings
  - Networked (i.e., thermal energy networks)
  - standalone heat pumps

Requirements

- Individual buildings over 150,000 SF and multiple buildings above 250,000 SF

Flexible Technical Assistance

Definition

- 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.

Eligibility

- Applications that display potential for energy savings, carbon savings, or process improvements
- Pay into Systems Benefit Charge (SBC) through their electric utility company, except for Large Scale Thermal projects

Cost-Share

- Based on market sector (commercial, industrial, university, hospitals etc.) and study type
- Typical cost-share is 50%
- Cost-share cap per project is 20% of annual energy expenditure or up to $500,000 whichever is lower

Flexible Technical Assistance

Program Parameters

- Third party technical assistance service provider is required
- Studies should analyze site-specific measures with energy/carbon savings potential

Process Timeline

- 4-8 weeks from the application received to issuance of NYSERDA PO
- Project schedule dependent on study completion

Payment Structure

- NYSERDA will contribute its cost-share, directly to the applicant per the approved scope of work.
- If applicant is the customer, proof of payment towards the contractor must be shown
- If applicant is the contractor, proof of payment by the customer towards their share of the study must be provided.

Large Scale Thermal Project Examples

Albany International Airport

- Service Provider – CHA Consulting
- Total Project Study Cost - $99,950
- NYSERDA Provided Funding - $49,975
- Cost-share Percentage – 50%
- District scale geothermal heat pump study alongside evaluation of heat recovery options
- Currently being designed with cost-sharing from PON 4614

Bard College

- Service Provider – LaBella Associates
- Total Project Study Cost - $265,768
- Cost-share Percentage – 60%
- Net zero campus feasibility study evaluating phasing out of fossil fuels through conversion to geothermal across the campus
- Geothermal system installed at the campus library in 2024

Useful Program Links

- FlexTech Program Homepage
- PON 4192 Solicitation
- Documents and Resources
- Large Scale Thermal Program Homepage
- Large Scale Thermal Study Requirements

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Heat Recovery Program

HeatRecovery@nyserda.ny.gov

https://www.nyserda.ny.gov/All-Programs/Heat-Recovery-Program/Heat-Recovery-Project-Development

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Heat Recovery turns a problem into an opportunity.

Buildings waste heat through a variety of processes including ventilation, cooling & wastewater.

Recovering wasted heat and recycling it directly at point of use or storing it for later represents a promising approach to large building decarbonization.

Heat Recovery opportunities arise from the heat rejected by equipment or processes within building systems.

Heating

Cooling

Ventilation

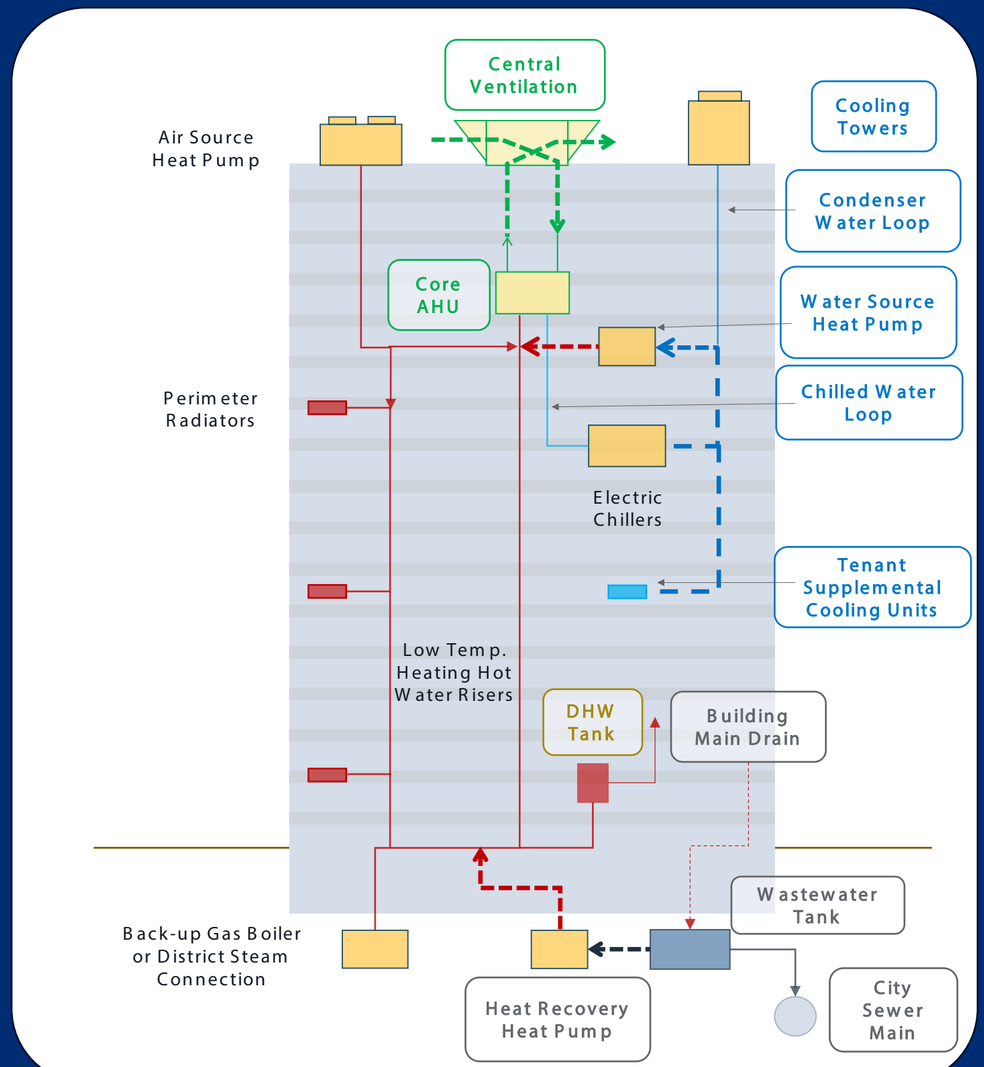
Cooling produces heat

Heat is lost through ventilation…

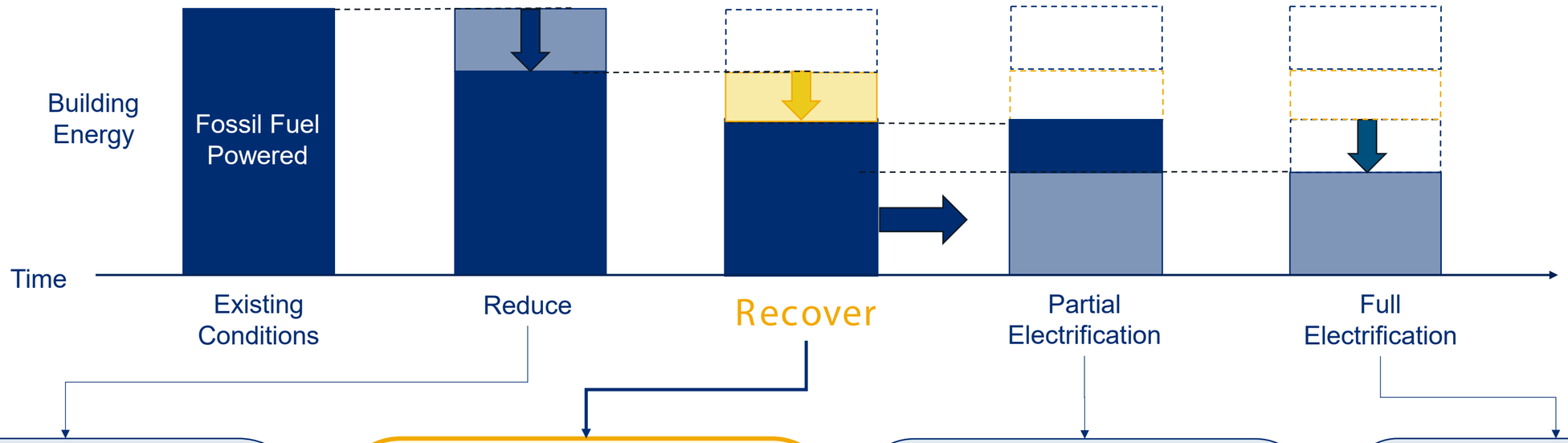
…or goes down the drain

Internal processes also produce heat

Heat can be stored



Heat Recovery is an essential step in phased decarbonization



Reduce Energy Load and Reconfigure

- Building Envelope Improvements
- Control Optimization
- Ventilation Improvements
- Dedicated Outside Air System
- Hydronic Distribution
- Lower Heating Supply Temp.
- Terminal Units Replacement

Recover Wasted Heat

- Ventilation Heat Recovery
- Cooling Heat Recovery
- Wastewater Heat Recovery
- Thermal Storage

Partial Electrification

Replace fossil fuel inputs and prioritize the techno-economic portion of load

- Air Source Heat Pumps
- Water Source Heat Pumps
- Geothermal
- Thermal Layering

Full Electrification

In-time, replace or remove the remaining peak load equipment

- Heat Pumps
- Thermal Storage
- District Thermal Network
- Grid-interactivity

The Heat Recovery Program (PON 5547) offers $12M in funding across four categories:

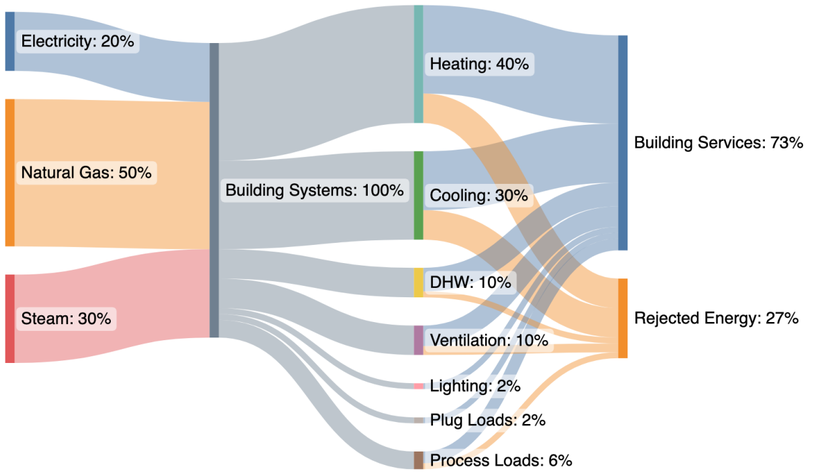
Category Name	Funded Activities	Maximum NYSERDA Funding Per Award	Building Eligibility	Application
Category 1: *Heat Recovery Opportunity Assessment*	Document current operations and define heat recovery opportunity	$40,000 (75% cost-share)	Existing building in NYS All sectors, excluding new construction and single family	Apply before November 17, 2025
Category 2: *Heat Recovery Project Design*	Develop schematic designs for viable heat recovery project	$80,000 (75% cost-share)		
(NEW) Category 3: *Heat Recovery Demonstration*	Implement eligible heat recovery projects*	$2,000,000		Round 1: Submit proposal by November 7, 2024 Rounds 2,3 TBA for 2025
(NEW) Category 4: *Manufacturer Growth Initiative*	Business development for qualified Manufacturers, RFQL 5217 - Heat Recovery Solutions	$100,000 (75% cost-share)	N/A	Apply to RFQL 5217, then apply to Category 4 before November 17, 2025

1 Heat Recovery Opportunity Assessment

- Document current building infrastructure, quantify/diagram rejected heat from current operations, explore potential cost-effective measures to recover and reuse heat to reduce total consumption
  - Consider ventilation, cooling, process, wastewater, and thermal storage in assessment
  - Key outcome is actionable information providing justification for customers to move forward with design

- **75% cost share of assessment costs capped at $40k**
  - Kickoff Meeting with NYSERDA
  - *Final Report:* Process, Findings, and Recommendations from Assessment including an Energy Flow Diagram

Sample Energy Flow Diagram



Additional examples available on the Program webpage

2 Heat Recovery Project Design

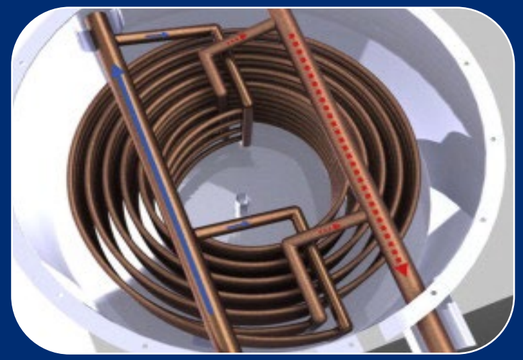
- Develop a technically and economically feasible project design to improve the heat recovery performance of an existing property
- Recovery from ventilation, cooling, process, and wastewater systems is eligible, and thermal storage when accompanying other eligible measures
- *Examples of potential designs include:*
  - Integrating Energy Recovery Ventilator (ERV) to existing or modified building ventilation systems
  - Heat recovery chiller extracting heat from the condenser water loop before it is rejected via cooling towers
  - Wastewater heat pump, recovering heat from wastewater at building scale before it exits to the municipality's sanitary sewer main
- **75% cost share of design costs capped at $80k**
  - Design Charrette with NYSERDA
  - Schematic project designs, data collection form, and accompanying narrative
  - Final versions reflecting NYSERDA comments

Eligible Heat Recovery Solutions for Category 3

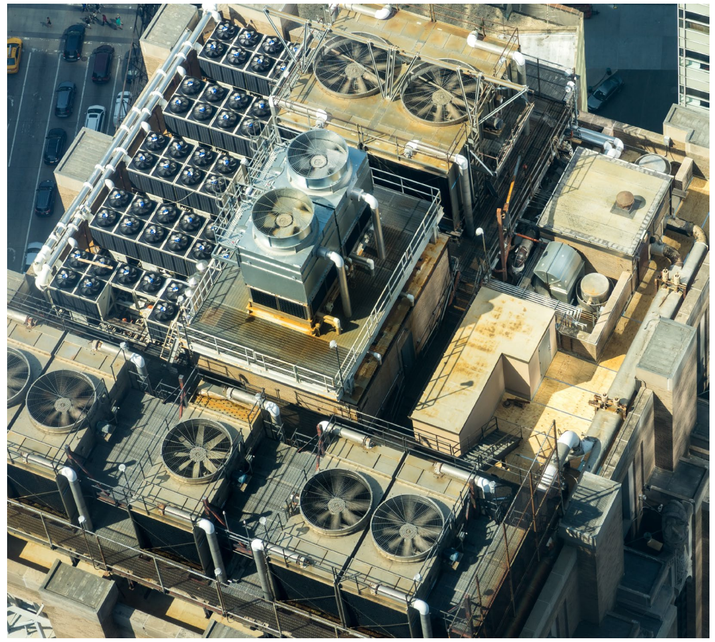
Data Center Heat Recovery

High Temperature Heat Pumps

Packaged Exhaust Heat Recovery



Thermal Storage



*The **NYSERDA Heat Recovery Solutions [HRS]*** qualification recognizes technologies that enable buildings to decarbonize their operations and advances the adoption of heat recovery by New York State's real estate decision-makers and the architects, engineers, and retrofit construction communities.

Through this technical vetting of solution providers and market acceptance of products, NYSERDA will promote qualified heat recovery solutions and their real-world efficacy:

- Help qualified Manufacturers access the NYS retrofit market [PON 5547]
- Participate in roundtable exchanges with key market stakeholders
- Support heat recovery knowledge & technology transfer
- **NEW -- Category 4**: direct funding for Manufacturer business development

Heat Recovery Solutions -- RFQL 5217

Read RFQL Documentation | Share with Manufacturers | Submit Online Application

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Visit NYSERDA Heat Recovery Program to get involved.

NYSERDA is pushing heat recovery to become a common solution for phased building decarbonization in NYS; with engagement from various engineering consulting firms, building owners and NYS focused cutting-edge global manufacturers.

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