Energy Efficiency Stakeholder Meeting

May 16, 2024

Agenda

1. Re-cap of Last Meeting
2. New Jersey Energy Efficiency Programs
3. Energy Efficiency Updates
    - NJCEP Updates
        - New Construction Program Update
        - Whole House Pilot Program Update
        - Inflation Reduction Act Request for Information
        - Community Energy Plan Grant / Community Energy Plan Implementation Grant Update
        - Benchmarking Update
    - Utility Updates
    - Regulatory Updates
        - Triennium 2 Filings Review
4. Guest Presentation – Heat Pump Water Heaters
5. General Q&A
6. Items of Interest
7. Next Meetings

Recap of Last Month

April Meeting Recap

What we covered:

- ✓ NJCEP Updates
  - ✓ NJCEP New Construction Program
  - ✓ Community Energy Plan Grant / Community Energy Plan Implementation Grant Update
  - ✓ Benchmarking Update
- ✓ Utility Updates
- ✓ Regulatory Updates
  - ✓ Triennium 2 Filings Review
- ✓ Guest Presentation: Ground Source Heat Pumps, Geothermal, and Air to Water Heat Pumps
- ✓ Q&A

New Jersey Energy Efficiency Programs

New Jersey Energy Efficiency Programs

www.NJCleanEnergy.com/TRANSITION

NJBPU and NJCEP Administered Programs

New Jersey's cleanenergy program℠

- New Construction (residential, commercial, industrial, government)
- Large Energy Users
- Energy Savings Improvement Program (financing)
- State Facilities Initiative*
- Local Government Energy Audits
- Combined Heat & Power & Fuel Cells

*State facilities are also eligible for utility programs

Utility Administered Programs

atlantic city electric (An Exelon Company) · Jersey Central Power & Light (A FirstEnergy Company) · PSE&G · Rockland Electric Company · Elizabethtown Gas · South Jersey Gas · New Jersey Natural Gas

- Existing buildings (residential, commercial, industrial, government)
- Efficient Products
  - Lighting & Marketplace
  - HVAC
  - Appliance Rebates
  - Appliance Recycling

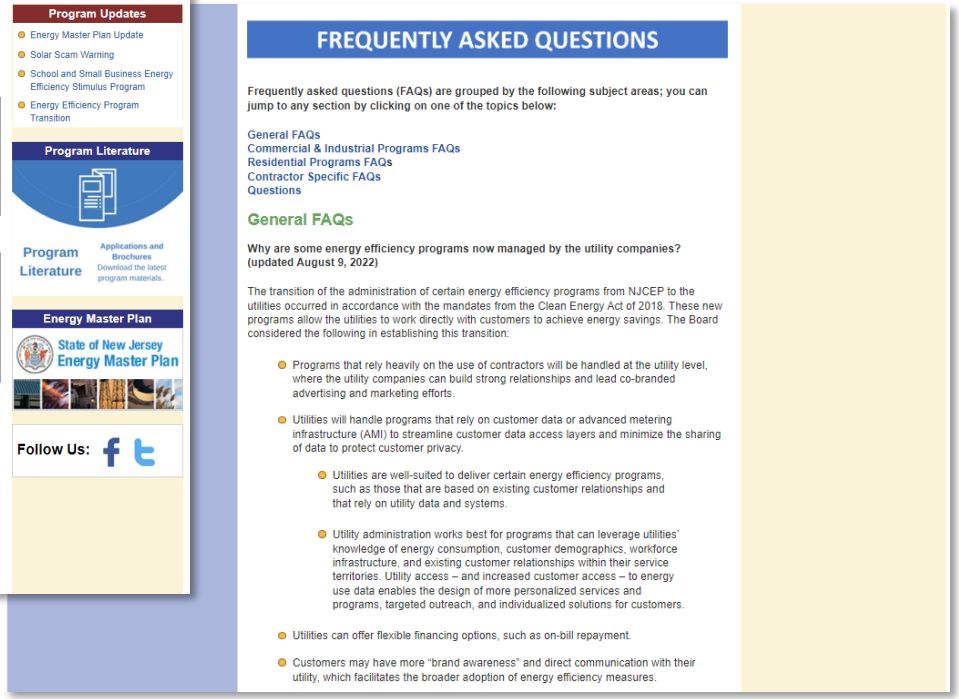
NJBPU and Utility Co-Administered Programs

New Jersey Comfort Partners

BPU New Jersey's cleanenergy program℠

Energy Efficiency Program Information

www.NJCleanEnergy.com/TRANSITION



FREQUENTLY ASKED QUESTIONS

Frequently asked questions (FAQs) are grouped by the following subject areas; you can jump to any section by clicking on one of the topics below:

General FAQs
Commercial & Industrial Programs FAQs
Residential Programs FAQs
Contractor Specific FAQs
Questions

General FAQs

Why are some energy efficiency programs now managed by the utility companies? (updated August 9, 2022)

The transition of the administration of certain energy efficiency programs from NJCEP to the utilities occurred in accordance with the mandates from the Clean Energy Act of 2018. These new programs allow the utilities to work directly with customers to achieve energy savings. The Board considered the following in establishing this transition:

- Programs that rely heavily on the use of contractors will be handled at the utility level, where the utility companies can build strong relationships and lead co-branded advertising and marketing efforts.
- Utilities will handle programs that rely on customer data or advanced metering infrastructure (AMI) to streamline customer data access layers and minimize the sharing of data to protect customer privacy.
  - Utilities are well-suited to deliver certain energy efficiency programs, such as those that are based on existing customer relationships and that rely on utility data and systems.
  - Utility administration works best for programs that can leverage utilities' knowledge of energy consumption, customer demographics, workforce infrastructure, and existing customer relationships within their service territories. Utility access – and increased customer access – to energy use data enables the design of more personalized services and programs, targeted outreach, and individualized solutions for customers.
- Utilities can offer flexible financing options, such as on-bill repayment.
- Customers may have more "brand awareness" and direct communication with their utility, which facilitates the broader adoption of energy efficiency measures.

Energy Efficiency Updates:

New Jersey's Clean Energy Program

More NJCEP Information

Quarterly Newsletter:

www.NJCleanEnergy.com/NEWSLETTER

Clean Energy Program Filings:

www.NJCleanEnergy.com/FILINGS

Clean Energy Program Monthly Progress to Goal Report

www.NJCleanEnergy.com/EE - Meeting Materials Archive

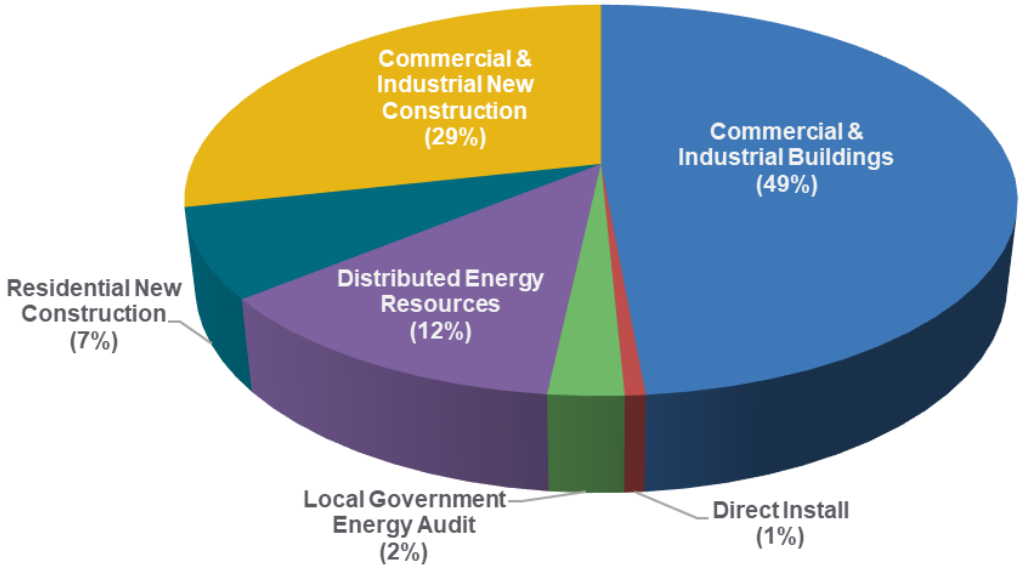
New in FY24:

Progress to Goals Report is posted with post-EE Stakeholder Meeting resources after this meeting

Budget Break-down by Program

FY24 TRC Managed Programs

Incentive Budget: $148,502,129



Energy Efficiency Programs FY24

NJCEP/TRC Managed

Closed

- Residential Products & HVAC
- Residential Existing Homes
- Direct Install
- SmartStart Retrofit

Closing Out

- C&I Buildings (existing buildings)
- Pay for Performance Existing Buildings
- School & Small Business Stimulus Program (federally funded)

NJCEP/TRC Managed

Open

- New Construction

  Was: Residential New Construction, SmartStart New Construction, Pay for Performance New Construction, Customer Tailored Energy Efficiency Pilot New Construction

- Large Energy Users
- Local Government Energy Audit
- Distributed Energy Resources

BPU/Utility Managed

Comfort Partners

Smart Start Buildings Retrofit
Program Completion

The **Smart Start Buildings Retrofit** program offered commercial/industrial prescriptive and custom existing building solutions that allowed for *a la carte* equipment incentives in all sized facilities

Results:

- **$315,000,000** incentives paid
- **40,000 applications** completed
- **17 year** program length
- **1,000,000 MWh** saved annually

Annual/yearly energy savings are the same as these greenhouse gas equivalents:

- **184 wind turbines** running for 1 year, or
- **137,871 homes'** energy use avoided for 1 year, or
- **1.9 power plant** emissions avoided for 1 year

New Jersey's cleanenergy program

Typical equipment: lighting & controls, hot water conservation, HVAC, motors, refrigeration, variable frequency drives

What is the New Construction Program?

COMING SOON

ABOUT THE PROGRAM

Three pathways to fit your needs to achieve greater energy savings

INCENTIVES

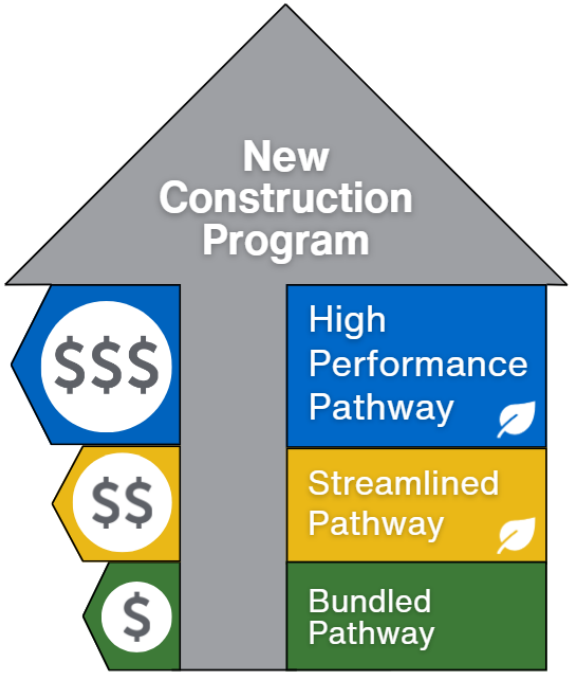
Based on selected pathways and size

WHO IS ELIGIBLE

All new construction buildings or eligible major renovation projects

ADDITIONAL OPPORTUNITIES

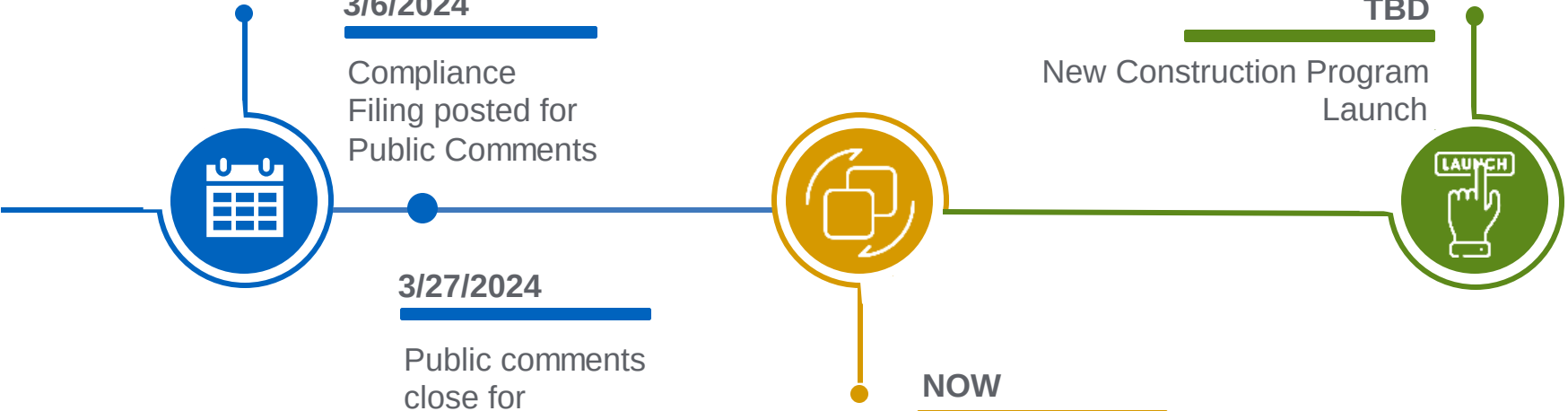
Incentives for energy efficiency beyond code requirements, encouraging greater energy savings



New Jersey's cleanenergy program

New Construction Program Timeline

COMING SOON



3/6/2024

Compliance Filing posted for Public Comments

3/27/2024

Public comments close for Compliance Filing

NOW

Current programs remain open until the transition to New Construction Program

TBD

New Construction Program Launch

Watch for BPU **Energy Efficiency Listserv** updates, attend **Energy Efficiency Stakeholder Meetings**, or attend an upcoming program overview or **trade ally webinar** event for details.

New Jersey Whole House Pilot Overview

Energy Efficiency Stakeholder Meeting

May 16, 2024

Mission

GHHI is dedicated to addressing the social determinants of health and the advancement of racial and health equity through the creation of healthy, safe and energy efficient homes. By delivering a standard of excellence in its work, GHHI aims to eradicate the negative health impacts of unhealthy housing and unjust policies for children, seniors and families to ensure better health, economic and social outcomes in historically disinvested communities – with an emphasis on communities of color.

Our Partners

Our Challenge: Addressing Equity and Energy Efficiency

- Weatherization should not and often cannot be performed in a home if the process or result can make the house more dangerous. This leads to a high number of **deferrals** from **Comfort Partners,** the state weatherization service for **low-income households.**

- Meeting the state's **climate goals** requires scaling up residential energy efficiency and electrification services, particularly for under resourced and historically excluded communities.

- These residents often occupy older, deteriorated housing, with conditions that negatively impact health and financial stability for families. **These are often the same conditions that result in deferral from weatherization programs like Comfort Partners.**

- Investment to reduce deferrals from energy efficiency programs and coordination with other housing programs is necessary to create equitable energy efficiency service delivery.

Implementation Site-Trenton

In 2021, GHHI published an Asset and Gap Analysis of state housing programs and resources to determine a priority location for the Whole House Pilot.

The report found alarming rates of lead poisoning, asthma related hospitalization, poverty, and high energy utility burden in Trenton.

	Trenton
Percent of Children Under 6 With EBLL	6%
Asthma Hospitalization Rate	2,350
Percent Pre-1980 Housing	91%
Percent Pre-1950 Housing	70%
Percent of Families Below FPL	25%
Energy Utility Burden in Households 0-60% AMI	8%

Poverty data and housing year built data based upon US Census ACS 2019 5-year estimates; energy burden data collected from: https://data.openei.org/submissions/573;

Elevated blood lead data from NJ Department of Health 2019 Childhood Lead Exposure Annual Report; Asthma data from New Jersey asthma profiles retrieved from: https://www.nj.gov/health/fhs/chronic/asthma/in-nj/

Causes of Weatherization Deferrals in Trenton

Barriers to weatherization most frequently include asbestos and moisture issues, including roof leaks, mold, and foundation leaks.

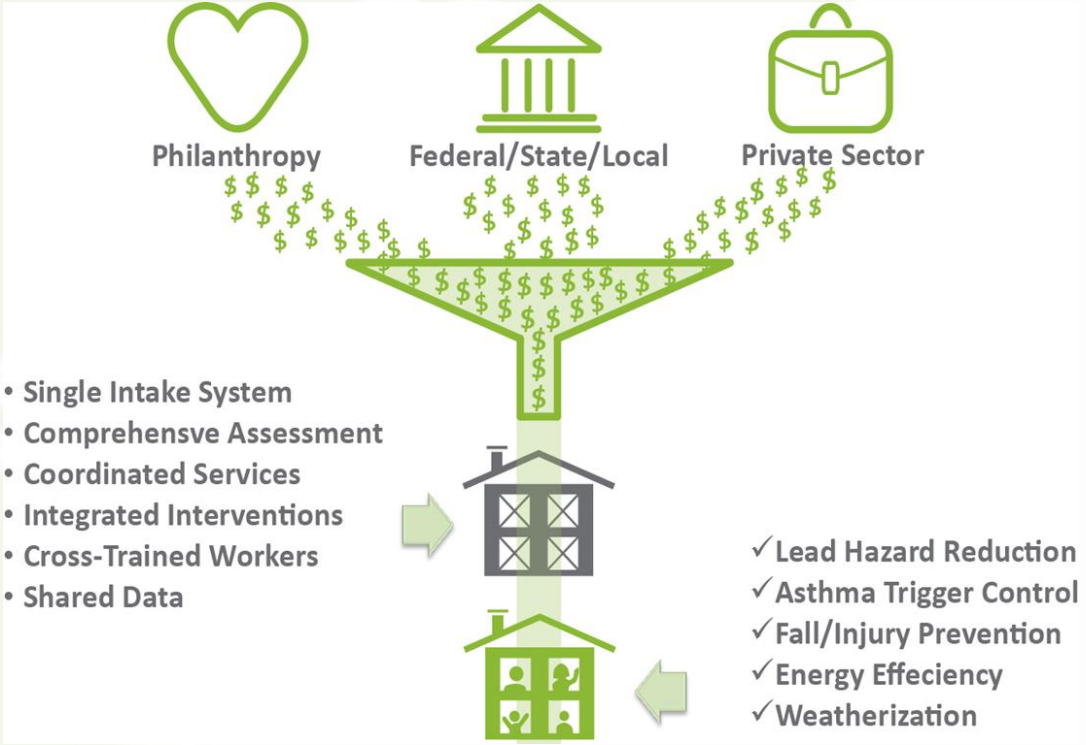
	Number (#)	Hazards Identified (%)
Total Referrals (Leads + Enrollees)	298	
Mold	84	28%
Roof Leak	37	12%
Asbestos	41	14%
Foundation Leak	41	14%
Unsafe wiring/knob and tube	12	4%
Structural Issues	7	2%
Sewer Leaks	2	1%
Other	12	4%

Aligning Resources to Advance Holistic Retrofits

Align
Services & funding

Braid
Relevant resources

Coordinate
Service delivery



Green & Healthy Homes Initiative®

Trenton Whole House Pilot

'Whole House' refers to a holistic approach to healthy housing, coordinating energy efficiency improvements while remediating health and safety hazards that pose a threat to human health and cause efficiency upgrade work to be deferred or delayed.

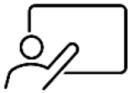
- **Goals Include:** Streamline and integrate programs that provide services for single and multi-family residences occupied by low- to moderate-income residents to improve energy savings and health and safety outcomes, 2) Support progress towards NJ goal to make 10% of low to moderate income housing stock "electrification ready" by 2030.

- **Pilot Objectives:** Complete Whole House interventions in 100 units, and electrification or electrification readiness measures in a subset of 20 units.

- **Braided Resources:**
  - State Energy Plan – pre-weatherization health and safety and electrification measures
  - Department of Community Affairs LRAP – lead paint remediation and abatement
  - Partnership w/ Isles- referrals to Isles LRAP and Healthy Homes programs
  - Comfort Partners- weatherization and energy efficiency.

Green & Healthy Homes Initiative®

How does the Trenton Whole House Pilot Work?

Outreach + Referral	Intake	Client Assessment	Resident Education + Referrals	Comprehensive Assessment	Housing Intervention	Quality Assurance	Follow Up & Close Out
							

Client is deferred from Comfort Partners due to hazard in home

The client is guided through the Whole House Program by GHHI's Intake Specialist and Program Implementation Coordinator so that their experience is as seamless as possible with Comfort Partners and other partner programs.

Client receives weatherization from Comfort Partners. GHHI collects post-intervention data

Whole House + Electrification & Electrification Readiness

- Within the Whole House Pilot, GHHI will identify **20 priority homes** to receive electrification and electrification-ready interventions.

- Priority homes will have the greatest potential for energy and cost savings and includes households with electric-resistance heating, delivered fuels, or old and inefficient gas heating systems.

- In addition to the standard Whole House and Comfort Partners offerings:

  - **Electrified homes** will receive appliance replacement including cold climate heat pumps, heat pump water heaters, and induction stoves. They will also receive electrical upgrades as needed.

  - **Electrification-ready homes** will keep fossil-fuel space heating while receiving proactive electrical upgrades and have other appliances evaluated for replacement based on energy-efficiency and health criteria.

Intended Impact of Trenton Whole House Approach

Input

Trenton Whole House Pilot

Energy Efficiency
Weatherization
Healthy Homes

Energy Outputs	• Reduced kWh consumed • Reduced energy demand
Non-Energy Outputs	• Improved air quality • Increased thermal comfort • Reduced toxins
Energy Benefits	• Lower utility bills • Greenhouse gas reduction
Non-Energy Benefits	• Environmental quality • Occupant health • Family economic security
Long Term Impacts	• Neighborhood quality improvement • Reduced health disparities • School and work attendance • Economic productivity

Green & Healthy Homes Initiative®

Progress

- Planning
  - Published an **asset gap analysis**.
  - Developed **protocols for braiding GHHI and partner resources.**
  - Developed **comprehensive evaluation** and **data collection infrastructure.**
  - Built collaborative **partnership** with Comfort Partners implementer.

- Implementation
  - Have received almost **300 deferrals** from Comfort Partners.
  - Conducted environmental assessments and pre-intervention surveys for **53 households.**
  - Scheduling bids and deploying contractors to first **15 units** utilizing new **State Energy Plan funds** from BPU to address hazards**.**
  - Launching new DCA funded **LRAP program** this month to address lead hazards.
  - Actively building contractor pool - **9 qualified lead contractors over past month.**

- Electrification/Electrification Readiness
  - **Developed Electrification/Electrification Pilot Plan** with BPU and BPU TA providers and working through implementation details with Comfort Partners and PSE&G.

What's Next?

- **Implement electrification plan** and process and identify priority electrification candidates from our pool of clients.
- **Return 100 units to Comfort Partners** to complete weatherization services
- Align and coordinate **community health services** in Trenton
- Develop further **housing rehabilitation and repair service partnerships** to direct more resources towards existing and future clients
- Complete **evaluation** and document challenges and successes
- **Scale the program**

Questions

Inflation Reduction Act (IRA) HOMES Rebates Request for Information

- A Request for Information (RFI) was released on Wednesday, May 8.
- Interested parties and members of the public are invited to provide written responses to the RFI regarding the design of programs to implement the IRA Home Efficiency Rebates and Home Electrification and Appliance Rebates funding.
- The public notice can be found on the BPU Website at https://www.nj.gov/bpu/newsroom/public/
- The deadline for comments is **5:00 PM EST on May 21, 2024.**

Community Energy Plan Grant & Community Energy Plan Implementation Grant Update

These two grant programs support municipalities with community-level clean energy initiatives.

Community Energy Plan Grant (CEPG) Program

- Grants for municipalities to develop community energy plans aligned with their respective needs
- Two grant award levels
  - $10,000
  - $25,000 – overburdened municipalities

Community Energy Plan Implementation (CEPI) Grants

- Grants for municipalities to implement community energy projects
- Applicants eligible for $250,000 with possibility of additional awards if funds remain after all priority projects are funded.

Sustainable Jersey will provide Technical Assistance for applicants, with a focus on assistance for overburdened municipalities

Community Energy Plan Grant & Community Energy Plan Implementation Grant Update

New Application Deadline!

Friday, May 24

Applications must be submitted before 5 pm Eastern time

- Applications for both programs available on the NJCEP website at NJCleanEnergy.com/CEP
- Questions can be submitted to: community.energy@bpu.nj.gov

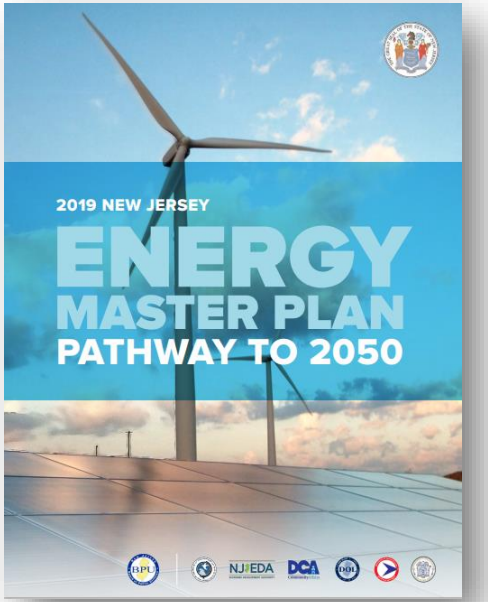
Energy Master Plan

Public Comment Period

- Comments due by **5pm EST on June 12, 2024**
- Comments should be submitted under Docket No. **QO24020126**

Public Hearings via Zoom

1. May 20, 2024 @ 9:30am EST – Strategies 1, 2, 5
2. May 22, 2024 @ 6:00pm EST – Strategies 3 & 4
3. May 29, 2024 @ 9:30am EST – Strategies 6 & 7
4. June 3, 2024 @ 1:00pm EST – Overview, Progress, & Current Actions for all Strategies in 2019 EMP



Registration links and other information can be found in the Public Notice on BPU's website.

BPU New Jersey's cleanenergy program™

Benchmarking Update

- As of April 2nd, postal mailings were sent to commercial building owners
  - Some mailings were inadvertently sent to public and other tax exempt buildings that do not need to complete benchmarking reporting
  - As of May 2nd, corrected postal mailings were sent to those public and other tax exempt building owners

- The submission deadline is July 1, 2024 for this reporting year (2023)
  - Building owners will have a 90-day grace period after the July 1st date to report

- A Helpdesk is available to answer questions about the benchmarking program and Portfolio Manager
  - To view frequently asked questions, submit a general inquiry or an exemption request, receive instructions for how to report, and obtain training resources and important updates: https://nj.beam-portal.org/helpdesk/
  - To submit an inquiry to the Helpdesk, please visit: https://nj.beam-portal.org/helpdesk/ and select "New Ticket"
  - To respond to a previously submitted ticket or a received email, please email njbpubenchmarking@beam-portal.org or call phone number 888-533-4571

Energy Efficiency Updates:

Utility Updates

Utility Updates

NJ Energy Efficiency Stakeholder Meeting

Peter Druckenmiller, SJI

on Behalf of The NJ Joint Utilities – May 16, 2024

atlantic city electric™ AN EXELON COMPANY

ELIZABETHTOWN GAS

Jersey Central Power & Light A FirstEnergy Company

New Jersey Natural Gas

PSE&G

Rockland Electric Company

SOUTH JERSEY GAS®

Utility Updates

- **All utilities submitted their filings for the Second Triennium (1/1/2025-6/30/2027)**
  - All utilities have submitted responses to extensive discovery requests and are working with the parties toward settlement
- **Status of the Extension Requests for the First Triennium (to cover 7/1/2024-12/31/2024)**
  - Extensions were approved for Elizabethtown Gas, New Jersey Natural Gas and South Jersey Gas on April 30th
  - PSE&G and electric utilities are working with the parties in the case to finalize settlements
- **Joint Utility Contractor Calls**
  - Residential HPwES contractor call scheduled for May 23rd
- **Community Events**
  - ACE is participating in the following upcoming community events:
    - ***Nanticoke Lenni-Lenape Pow Wow;*** June 9,10am-3pm; 735 Rte 40, Pilesgrove, NJ 08098
    - ***Winslow TWP Juneteenth;*** June 22, 2pm-6pm***;*** Peter Volpa Park at 569 Sickler Ave, Sicklerville, NJ 08081
  - JCPL will be attending the ACCA Meeting on May 22nd and The Jersey City Summit on May 29th

Utility Updates

Earth Month Campaigns

- Rockland Electric

  RECO is continuing grassroots outreach to local community environmental and Green organizations to promote energy efficiency and clean heat programs.

- PSE&G
  - External communications promoting the Earth Month smart thermostat sale
    - Bill inserts, Residential e-newsletter, Google Postcard , MyEnergy Postcard , MyEnergy Challenge Email, PSEG.com Homepage Banner, Social media on PSEG's Facebook, Instagram, and X accounts

- NJNG
  - Discounts on smart thermostats via the NJNG Marketplace extended through July 30th
  - Omnichannel marketing approach communicating promotion to residential customers using historical marketplace purchase data and propensity modeling for further personalization and segmentation.
    - Primary channels: marketplace banner, direct mail postcard, social ads, social posts, drip emails and customer newsletter

- ETG, and SJG are offering promotions on their Efficient Products marketplaces
  - www.elizabethtowngasmarketplace.com
  - www.southjerseygasmarketplace.com

New Jersey Natural Gas - Major Spring Events

We're celebrating 21 years of ocean discovery, coastal stewardship and energy conservation. Ocean Fun Days is an eco-friendly event the whole family can enjoy! Includes an Energy Scavenger hunt featuring the BPU!

Dates (both days will run 11 a.m. – 3 p.m.)

- **May 18** - Island Beach State Park, Seaside Park
- **May 19** - NJ Sea Grant Consortium, Sandy Hook

NJNG x BlueClaws Games

Hit an energy-saving home run this season with New Jersey Natural Gas and the Lakewood BlueClaws. During the games, NJNG's SAVEGREEN team will be sharing information on energy efficient tips and resources – plus some great swag.

Dates (all games start at 7:05 p.m.)

Remaining Games

- **May 31** – Medusas, Night 2
- **June 29** – Irish Heritage Night
- **August 15** – Medusa, Night 3

Energy Efficiency Updates:

Regulatory – State & Federal

Triennium 2 Filings Review (Docket No. QO23030150)

- February 26, 2024 – Presiding Commissioners' Orders
  - Summaries of proposed utility programs, budgets, cost recovery mechanisms
  - Rulings on motions to intervene and participate
    - New Jersey Natural Gas Company (QO23120868)
      - Intervenors: EEA-NJ, NJLEUC, NRDC, NJPEEC, Sierra Club
      - Participants: Uplight, Joint Utilities
    - Elizabethtown Gas Company (QO23120869)
      - Intervenors: EEA-NJ, NJLEUC
      - Participant: Uplight, Joint Utilities
    - South Jersey Gas Company (QO23120870)
      - Intervenors: EEA-NJ, NJLEUC
      - Participant: Uplight, Joint Utilities
    - Atlantic City Electric Company (QO23120871)
      - Intervenors: EEA-NJ, NJLEUC
      - Participants: Convergent, CPower, Google, Uplight, Joint Utilities
    - Jersey Central Power & Light Company (QO23120872)
      - Intervenors: EEA-NJ, NJLEUC
      - Participants: Convergent, CPower, Google, Joint Utilities
    - Public Service Electric & Gas Company (QO23120874)
      - Intervenors: EEA-NJ, NJLEUC, NRDC, NJPEEC, Sierra Club
      - Participants: Convergent, CPower, Google, United, Uplight, Joint Utilities
    - Rockland Electric Company (QO23120875)
      - Intervenor: EEA-NJ
      - Participant: CPower, Joint Utilities

Advanced Energy United (United), Convergent Energy and Power Inc. (Convergent), Energy Efficiency Alliance of NJ (EEA-NJ), Natural Resources Defense Council (NRDC), NJ Large Energy Users Coalition (NJLEUC), NJ Progressive Equitable Energy Coalition (NJPEEC)

Triennium 2 Filings Review (Docket No. QO23030150)

- Status:
  - Ongoing discovery
  - Prehearing orders: procedural schedules, issues to be resolved
    - PSE&G: March 28
    - ACE, JCP&L, RECO: April 12
    - NJNG, SJG, ETG: April 23
  - Further commissioner orders: https://www.nj.gov/bpu/agenda/presidingcommissionerorders.html
  - Settlement conferences (March–May 2024)
  - Board action (summer – early fall 2024)
  - Triennium 2 starts January 1, 2025

Triennium 2 Filings Review (Docket No. QO23030150)

- Public Hearings (4:30 P.M. & 5:30 P.M.)
  - ACE - Tuesday, June 4
  - ETG - Monday, May 20
  - JCP&L - Tuesday, June 11
  - NJNG - Thursday, May 16
  - PSE&G - Thursday, May 30
  - RECO - Thursday, June 6
  - SJG - Tuesday, May 21

All notices will be published to the Calendar of Events on the Clean Energy Website.

Guest Presentation

Christina Herkenham Thisse
Project Engineer III, TRC

Heat Pump Water Heater Technology

May 16, 2024

Christina Thisse

Christina Thisse – Project Engineer
Building Energy Efficiency & Decarbonization

Upstate New York | 7 Years Experience

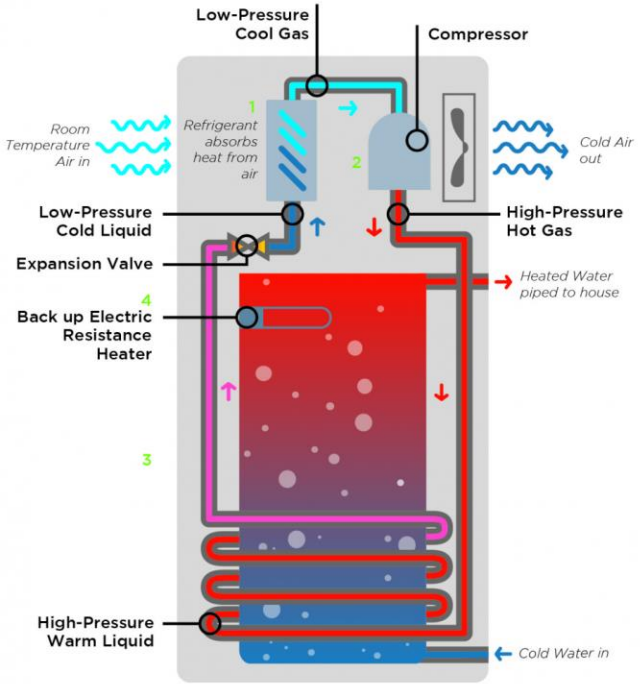
- Mechanical Engineering background
- BPI BA & AC-HP Professional
- Career start – C&I, municipal, and higher education building energy efficiency and decarbonization
  - Energy master planning
  - ASHRAE Level II Energy Auditing
- TRC career –
  - Commercial & Residential New Construction Programs
  - Res. Heat Pump QAQC Inspection Program
  - Res. Heat Pump Research & Technical Resource Development
  - Res. Heat Pump Contractor Training

Agenda

- How HPWHs Work
- Types of HPWH
- Design Considerations
- Unique Installation Features
- Operational Modes
- Available Resources

How HPWH Work

Transferring heat is much more energy efficient than creating heat.



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Types, Configurations, & Applications[4]

In-Unit Systems

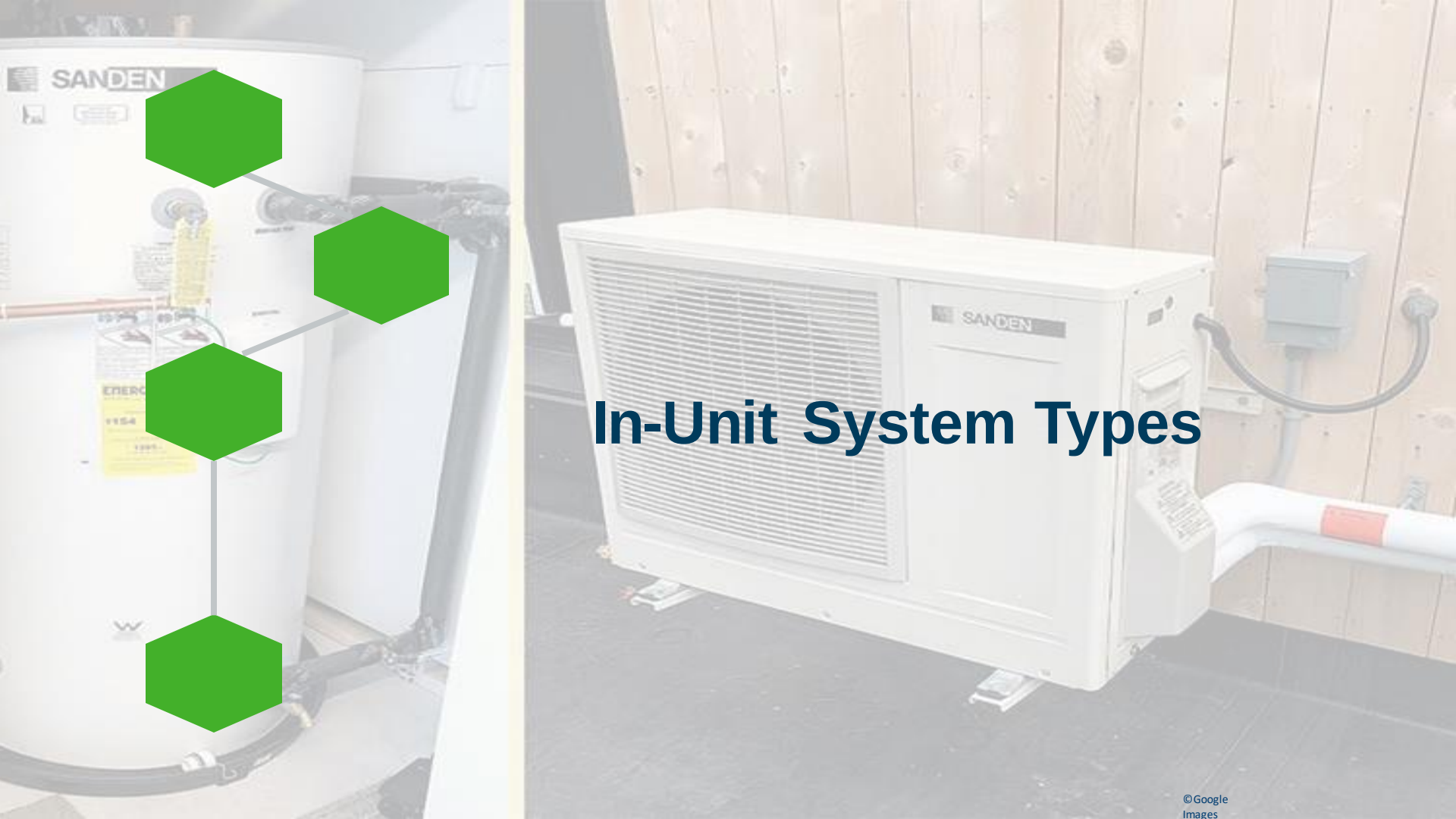
- Unitary HPWH
- Split HPWH
- 120-Volt HPWH

- Single-Family
- Per Unit Multi-Family

Central Systems

- Large Central Split
- Ganged HPWH
- Clustered HPWH
- Small Central Packaged
- Skid Mounted Systems

- Commercial
- Multi-Family



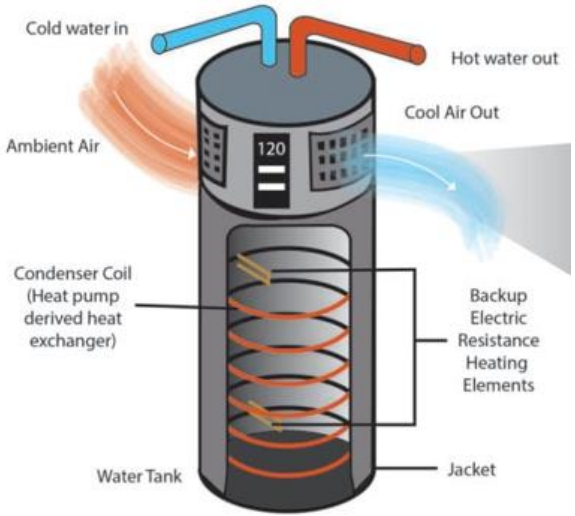
In-Unit System Types

Integrated or Unitary Heat Pump Water Heaters

Benefits
- High energy efficiency
- Easy to install
- Better control capabilities

Challenges
- Unit expels cool air
- Requires a minimum air volume
- Noisier than conventional WH

Tank sizes range from 50 to 80 Gal.



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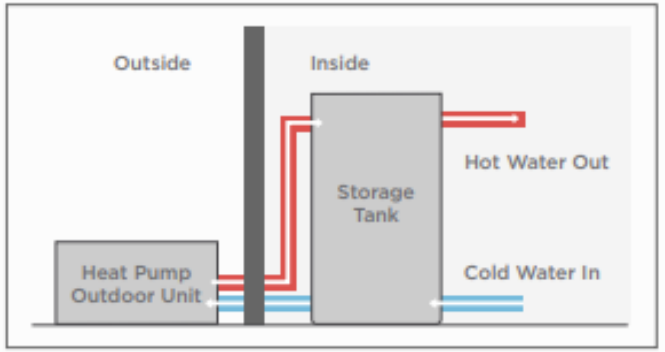
Split System Heat Pump Water Heater

Benefits
- Do not expel cool air indoors
- Some use CO2 as refrigerant
- Noisy side is outdoors
- Tank can be in a confined space

Challenges
- More complex installation
- Pipe freeze protection required

Tank size range - 43 to 505 Gal.



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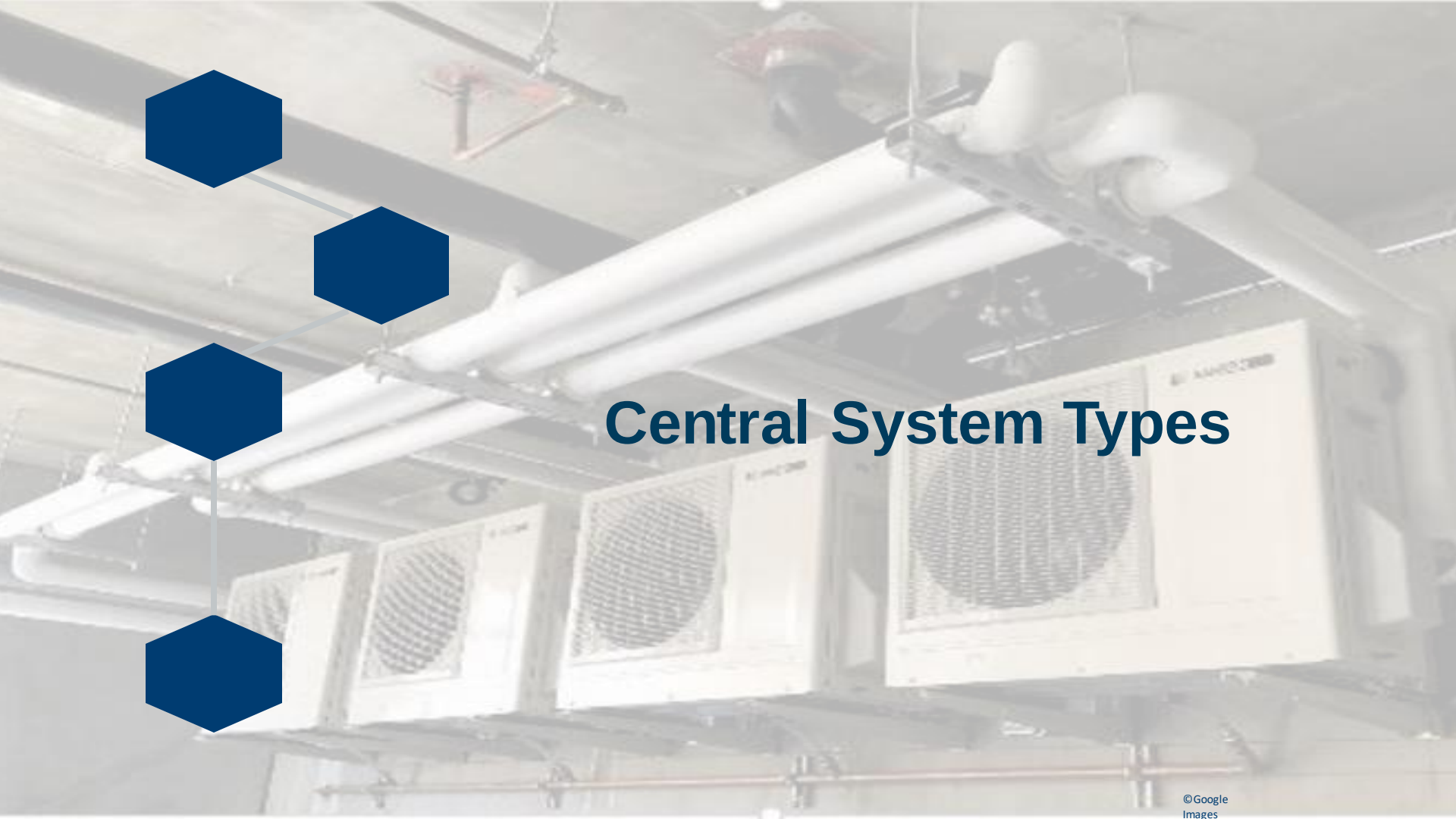
120-Volt Plug In Heat Pump Water Heaters

- Retrofit-ready, plug-in units
- Best suited for smaller homes with lower hot-water demand
- Tank size range – 40 to 80 Gal.

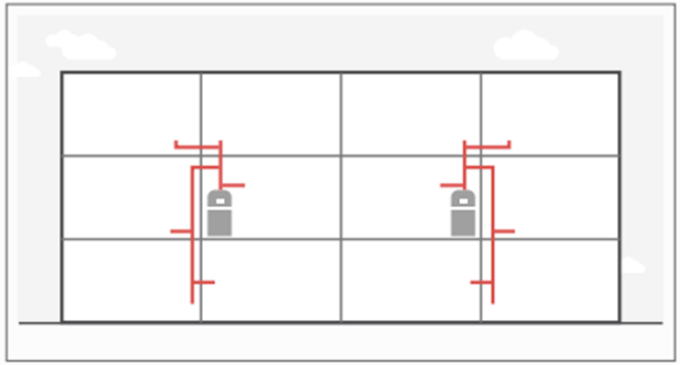
Central System Types



Large Central Split Systems

Ganged Residential Style

Clustered or Multi-Central Systems



Small Central Packaged HPWH

Skid Mounted Systems

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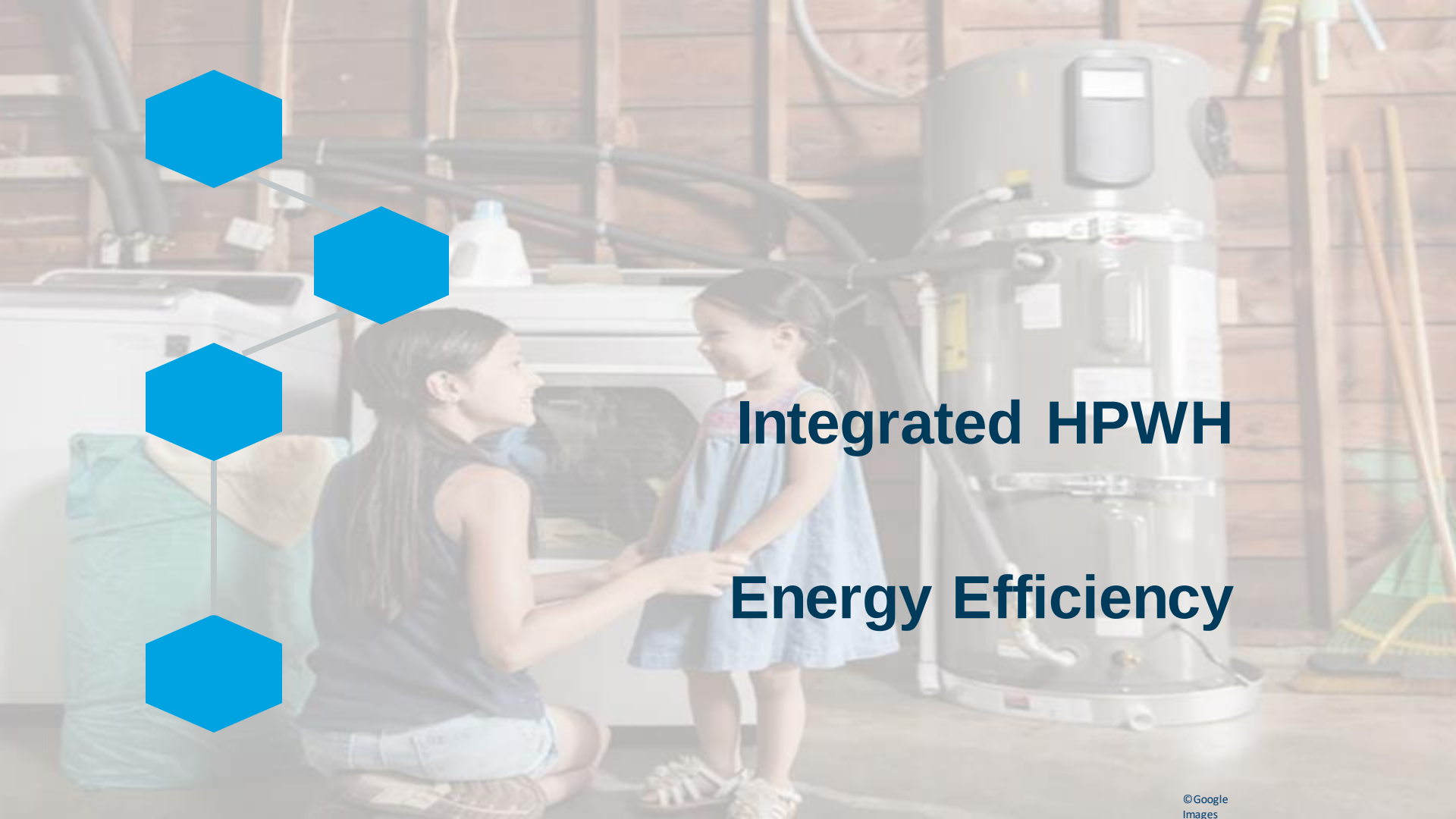

Integrated HPWH

Energy Efficiency

Energy Efficiency

- **3 to 4 times more energy efficient than electric resistance and gas water heaters**
- More energy savings = lower operating costs
- Same tank size range and operating temperature capability as conventional water heaters
- Higher up front product cost

Cost Factor	HPWH	Tank Electric	Tank Gas	Tankless Gas
Initial Cost	$1,500-$3,000	$450-$1,200	$500-$1,500	$800-$2,000
Annual Fuel Cost	$104-$160	$400-$600+	$200-$300	$175-$225
First Hour Recovery	60-100	55-72	60-85	100+
Max Temperature	140-160	140	140	140
Gallon Size	40-80	40-80	40-80	N/A
UE Factor	3.3-4.0	0.9	0.6-0.8	0.8-0.9

Is a Heat Pump Water Heater Right for Your Home? | ENERGY STAR

Integrated HPWH

Key Design Considerations

Location

Best locations vary based on climate and home configuration

- Warm Climates – Garages
- Cold Climates – Locations with waste heat available
- Surrounding air temperatures below 40° F will impact performance

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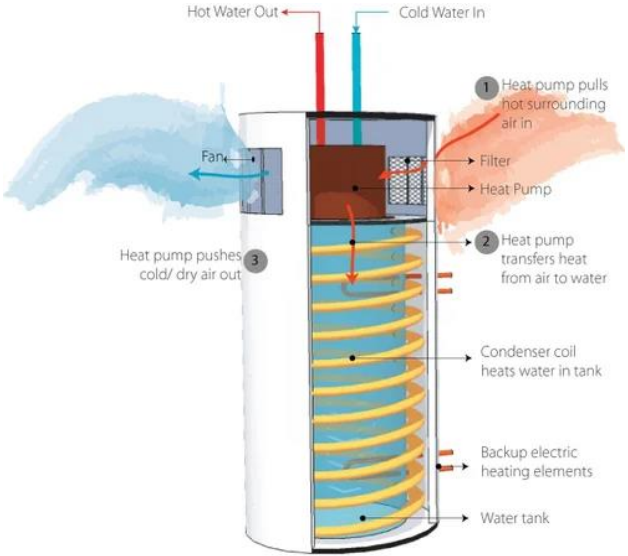
Cool Exhaust Air

Heat pump water heaters exhaust cool air

- **Locate the HPWH in infrequently occupied spaces whenever possible**
- If it must be located adjacent to occupied spaces, vent the cool exhaust air where temperature is not an issue
- Basements may see a 2 to 3˚ F decrease with HPWH
- Small spaces like closets may see a 6 to 7 ˚ F decrease



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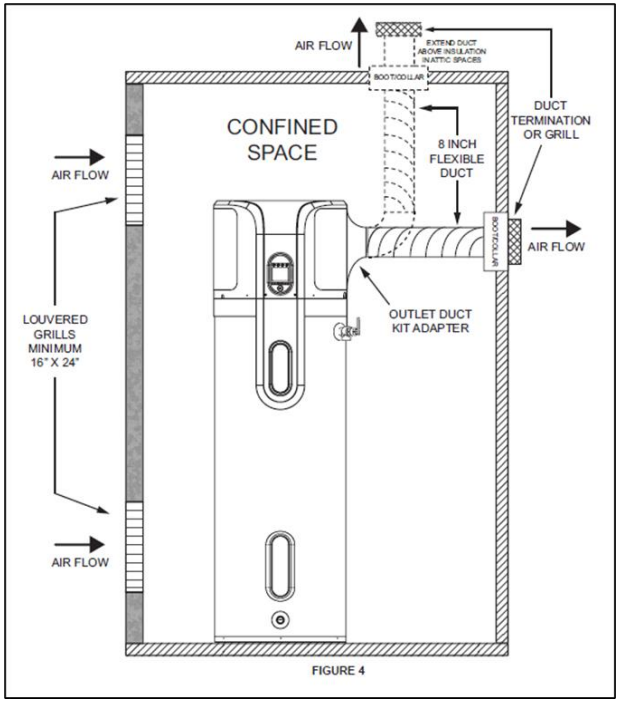
Space & Ventilation

- Manufacturers typically require access to a **minimum of 700 cubic ft. of free air space**
- When space is limited, there are both passive and active venting options
- Passive venting – fully louvered door or high and low transfer grilles
- Active venting – Ducted intake or exhaust combined with a transfer grille
- Active venting – Ducted both intake and exhaust



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Tank Sizing

- Always follow local plumbing code when it comes to minimum tank sizing
- For maximum efficiency, **upsize the tank over the standard practice used**
- Upsizing the tank will minimize inefficient electric resistance heating during periods of high-water demand

TANK SIZING GUIDELINES

Number of Bathrooms	1 to 1.5			2 to 2.5				3 to 3.5			
Number of Bedrooms	1	2	3	2	3	4	5	3	4	5	6
Uniform Plumbing Code First Hour Rating (gallons)	38	49	49	49	62	62	74	62	74	74	74
Minimum Typical HPWH Tank Size (gallons)	40	40	40	40	50	50	65	50	65	65	65
Up-Sized Tank (gallons)	50	50	50	50	65	65	80	65	80	80	80

NBI-SCE Heat Pump Water Heater Technical Guide

Integrated HPWH

Unique Installation Features

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Condensate Drainage

- Heat pump water heaters produce condensate
- Condensate must be drained away
- Tee port opening allows for periodic cleaning
- Condensate pump may be used for multiple products
- Code requirement for some states not to drain to DWV pipe

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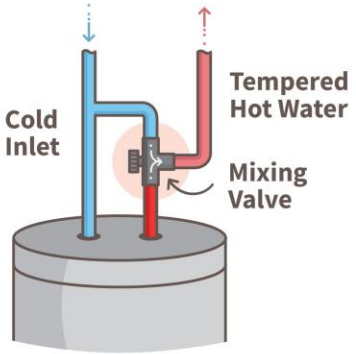
Mixing Valve

- Installing a thermostatic mixing valve (TMV) offers many benefits
- Prevents hot water scald potential
- Offers ability to increase the thermal storage capacity
- Allows for optimizing tank water heating operation when electricity prices are low
- Homeowners can take advantage of utility load-management programs or time-of-use electric rates



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Integrated HPWH Operational Modes

Recovery Rate and Efficiency

- **Recovery Rate** - the number of gallons of hot water a water heater can provide within an hour after being completely drained
- Heat pump water heaters have slower recovery rates compared to electric resistance and fossil water heaters.

RHEEM Professional Prestige® ProTerra™ Hybrid Electric

NOMINAL GALLON CAPACITY	RATED GALLON CAPACITY	MODEL NUMBER	UNIFORM ENERGY FACTOR (UEF)	COMPRESSOR BTU/H	UEF FIRST HR. RATING G.P.H.	RECOVERY IN G.P.H 90° F RISE
			ProTerra 30 Amp			
40	36	PROPH40 T2 RH375-30	3.83	4,200	60	27
50	45	PROPH50 T2 RH375-30	3.88	4,200	67	27

RHEEM Performance Power Vent Gas Water Heater

Fuel Type	Description	Nominal Gallon Capacity	Rated Gallon Capacity	Model Number	Gas Input in Thous. BTU/h	Recovery in G.P.H. 90° F Rise	First Hour Rating (Gallons)	Uniform Energy Factor (UEF)
Natural Gas	Tall	50	48	XG50T06PV42U0	42	42.4	78	0.68
Natural Gas	Short	50	48	XG50S06PV36U0	36	36.4	78	0.70

4 Basic Operational Modes

Hybrid Mode - Utilizes both heat pump and electric resistance heating elements as needed. **Fastest recovery.**

Heat Pump Only - Utilizes the heat pump only to move heat for full tank recovery. **Most efficient but longest recovery.**

Electric Only - Utilizes standard electric resistance elements to heat the tank without heat pump assistance. **Least efficient and no savings.**

Vacation - No operation for a specified number of days unless tank temp drops below the minimum set point by the manufacturer.

Resources

Resources

- Advanced Water Heating Specification - Northwest Energy Efficiency Alliance (NEEA) | View NEEA's Advanced…
  - Quality standards for sound levels, freeze protection, modes of operation, connectivity, and cold climate efficiency.

- Advanced Water Heating Initiative
  - Develop papers on emerging technology
  - How to make better use of HPWHs

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General Q&A

To submit questions in advance for next month:
EnergyEfficiency@bpu.nj.gov

Items of Interest

Next Meetings

Energy Efficiency Stakeholder Meetings

NJCleanEnergy.com/EE

3rd Thursday of the Month, 1-2:30pm

June 20, 2024
July 18, 2024
August 15, 2024
September 19, 2024
October 17, 2024
(no November meeting)
December 19, 2024

More Information

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THANK YOU