Energy Efficiency Stakeholder Meeting

October 20, 2022

Agenda

1. Welcome & Introductions
2. Recap of Last Meeting
3. Current Program Updates
   - BPU Updates
   - Utility Company Updates – Overview of C&I Programs
4. New Construction Program Update
5. Benchmarking
6. Working Group Updates
   - EM&V Working Group
     i. October 12 Board Order – Updates to Triennium 1 framework
     ii. Overview of recently completed studies: residential lighting, non-residential lighting, C&I industry standard practice
7. Clean Energy Conference
8. General Q&A
9. Items of Interest
10. Next Meetings

Welcome & Introductions

Recap of Last Month

September Meeting Recap

What we covered:

- ✓ Transition information on NJCEP website
- ✓ NJCEP and Utility Program updates
- ✓ Utility Residential Program overviews
- ✓ NJCEP New Construction Program update
- ✓ Benchmarking
- ✓ Working Group updates
- ✓ Technical Reference Manual Update
- ✓ State and Federal Lighting Update
- ✓ Clean Energy Conference
- ✓ Q&A

Post-Transition
Energy Efficiency Programs

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™

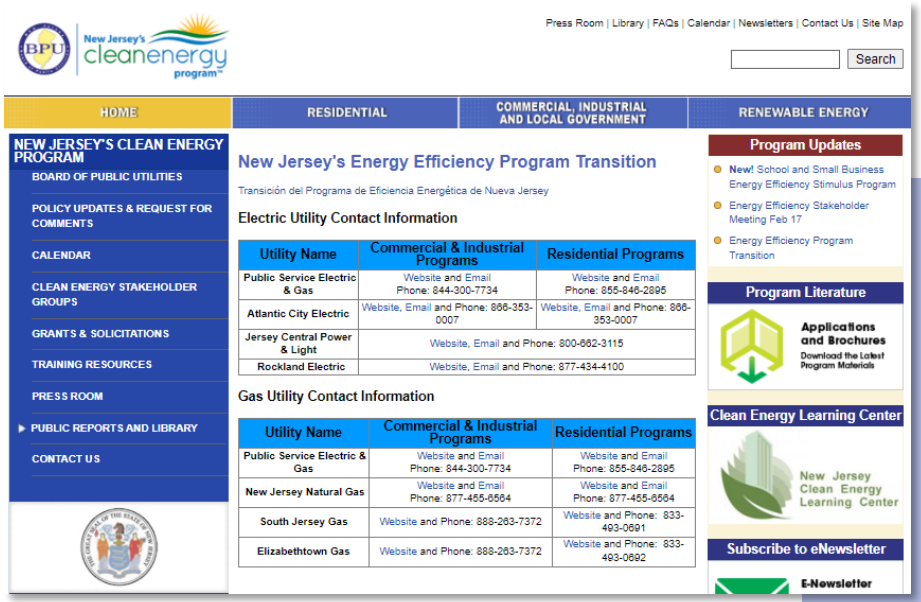
Visit our transition website:

www.NJCleanEnergy.com/TRANSITION

FAQs will be updated regularly

Visit our transition website:

www.NJCleanEnergy.com/TRANSITION



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HOME | RESIDENTIAL | COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT | RENEWABLE ENERGY

NEW JERSEY'S CLEAN ENERGY PROGRAM

- BOARD OF PUBLIC UTILITIES
- POLICY UPDATES & REQUEST FOR COMMENTS
- CALENDAR
- CLEAN ENERGY STAKEHOLDER GROUPS
- GRANTS & SOLICITATIONS
- TRAINING RESOURCES
- PRESS ROOM
- PUBLIC REPORTS AND LIBRARY
- CONTACT US

New Jersey's Energy Efficiency Program Transition

Transición del Programa de Eficiencia Energética de Nueva Jersey

Electric Utility Contact Information

Utility Name	Commercial & Industrial Programs	Residential Programs
Public Service Electric & Gas	Website and Email Phone: 844-300-7734	Website and Email Phone: 855-846-2895
Atlantic City Electric	Website, Email and Phone: 866-353-0007	Website, Email and Phone: 866-353-0007
Jersey Central Power & Light	Website, Email and Phone: 800-662-3115	
Rockland Electric	Website, Email and Phone: 877-434-4100	

Gas Utility Contact Information

Utility Name	Commercial & Industrial Programs	Residential Programs
Public Service Electric & Gas	Website and Email Phone: 844-300-7734	Website and Email Phone: 855-846-2895
New Jersey Natural Gas	Website and Email Phone: 877-455-6564	Website and Email Phone: 877-455-6564
South Jersey Gas	Website and Phone: 888-263-7372	Website and Phone: 833-493-0691
Elizabethtown Gas	Website and Phone: 888-263-7372	Website and Phone: 833-493-0692

Program Updates

- **New!** School and Small Business Energy Efficiency Stimulus Program
- Energy Efficiency Stakeholder Meeting Feb 17
- Energy Efficiency Program Transition

Program Literature

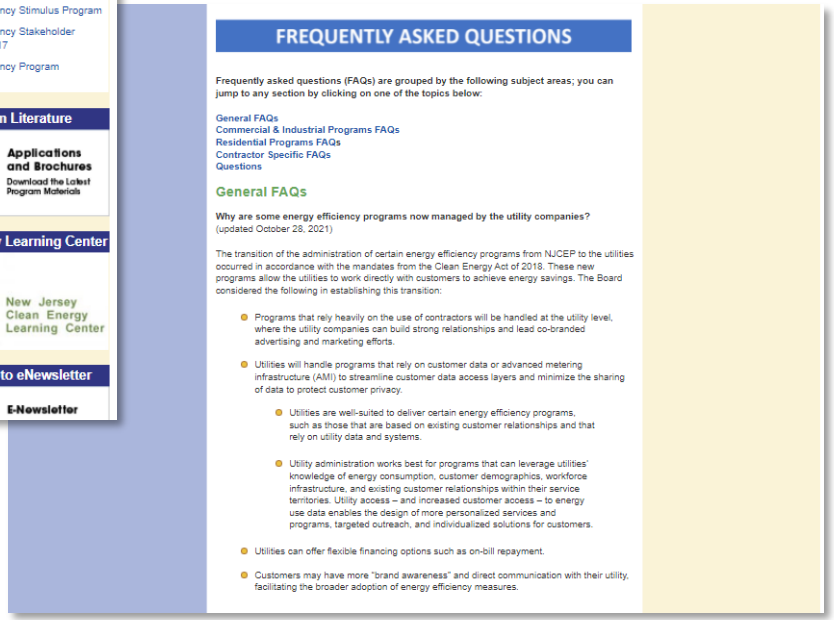
Applications and Brochures
Download the Latest Program Materials

Clean Energy Learning Center

New Jersey Clean Energy Learning Center

Subscribe to eNewsletter

E-Newsletter



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 October 28, 2021)

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, facilitating the broader adoption of energy efficiency measures.

Current Program Updates

BPU Program Updates: Progress to Goals (PTG) Report as of September 2022 – FY23

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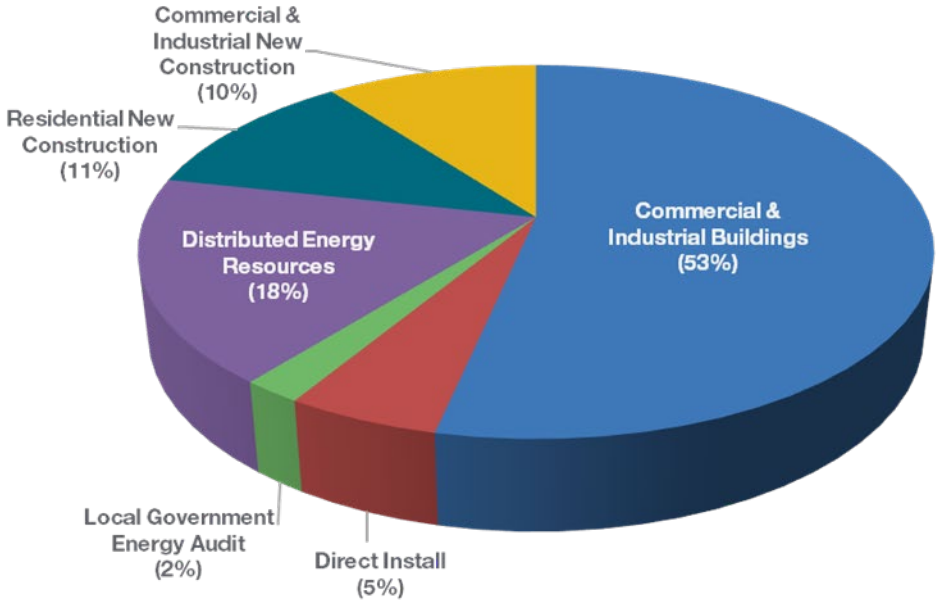
Note: The results presented here are preliminary and are subject to change.

Budget Break-down by Program

FY23 TRC Managed Programs

Incentive Budget: $117,415,104



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Energy Efficiency Programs FY23

NJCEP/TRC Managed -
Closed/Closing Out, Transitioned to Utilities

- Residential Products & HVAC
- Residential Existing Homes
- C&I Buildings (existing buildings)
- SmartStart Retrofit
- Pay for Performance Existing Buildings
- Direct Install

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
- School & Small Business Stimulus Program (federally funded)

BPU/Utility Managed

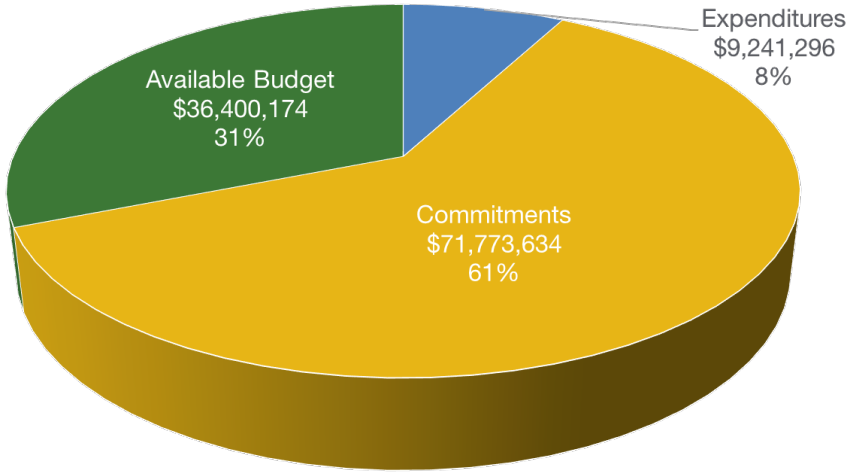
- Comfort Partners

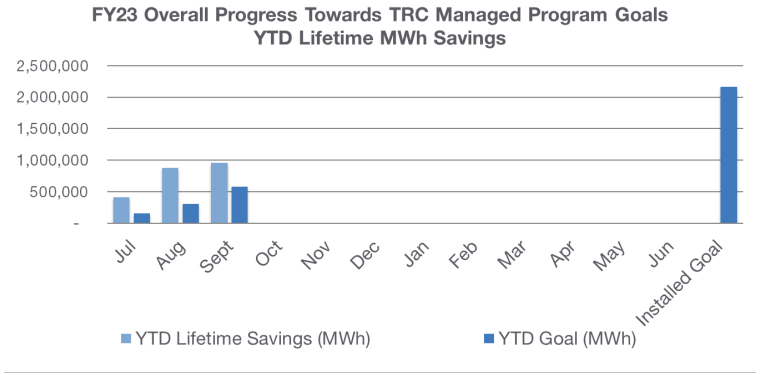
New Jersey's cleanenergy program

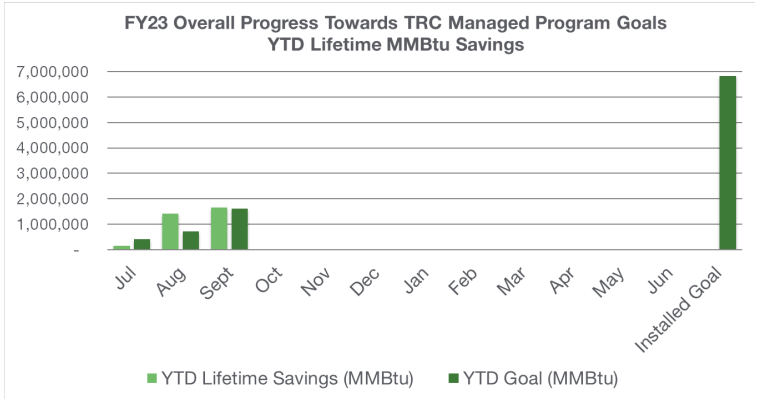
Progress Towards Goals – TRC Managed Programs

FY23 TRC Managed Programs

Incentive Budget: $117,415,104

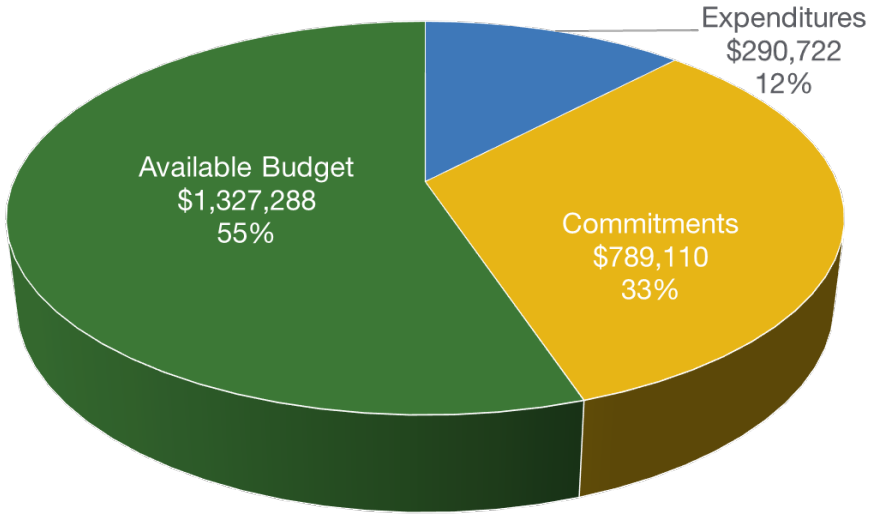






Local Government Energy Audit (LGEA)

FY23 Incentive Budget: $2,407,121



Program Highlights

- Received: 79 applications this month 125 YTD
- Approved: 18 applications this month 125 YTD
- Audited approximately 176,279 square feet
- Held 1 Exit Meeting for 1 site (including additional scopes)
- Delivered Final Audit reports on 1 site (1 entity)

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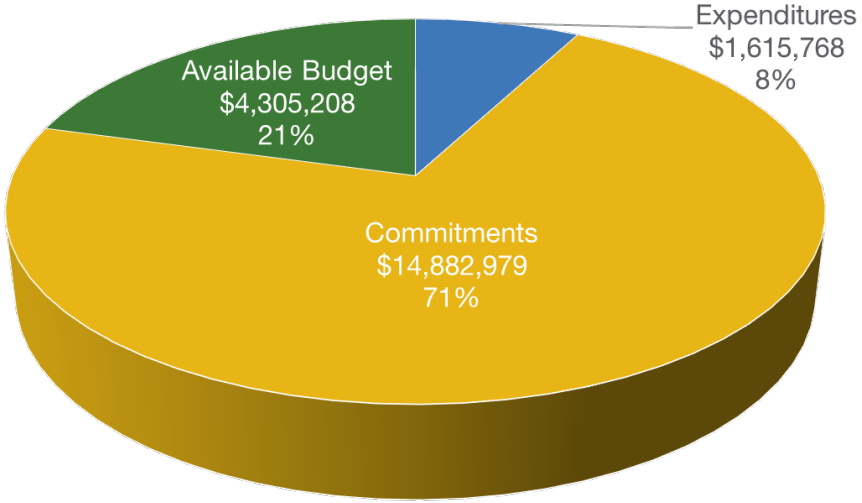
Distributed Energy Resources

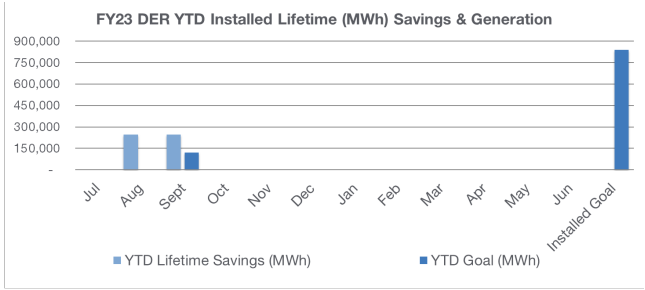
CHP and Fuel Cells

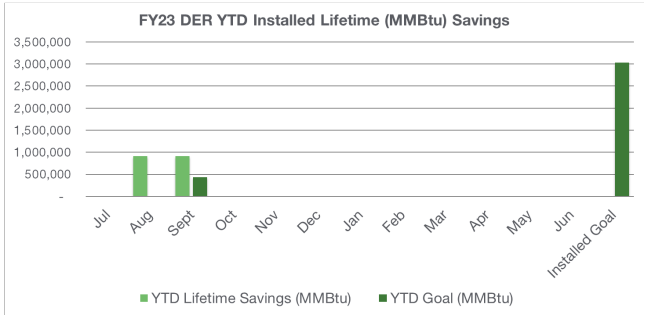
FY23 Incentive Budget: $20,803,955



Program Highlights

- Received: 0 applications this month 0 YTD
- Approved: 1 application this month 2 YTD
- Completed: 0 installations this month 0 YTD





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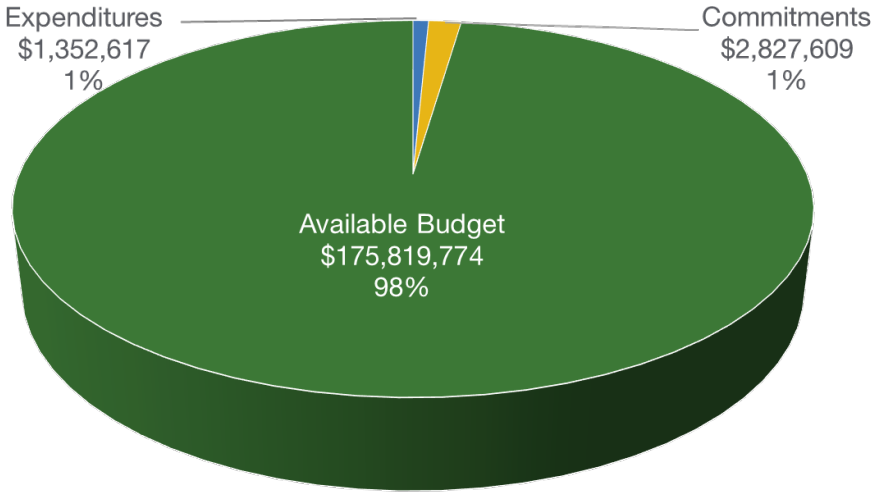
School & Small Business Stimulus Program

FY23 Incentive Budget: $180,000,000



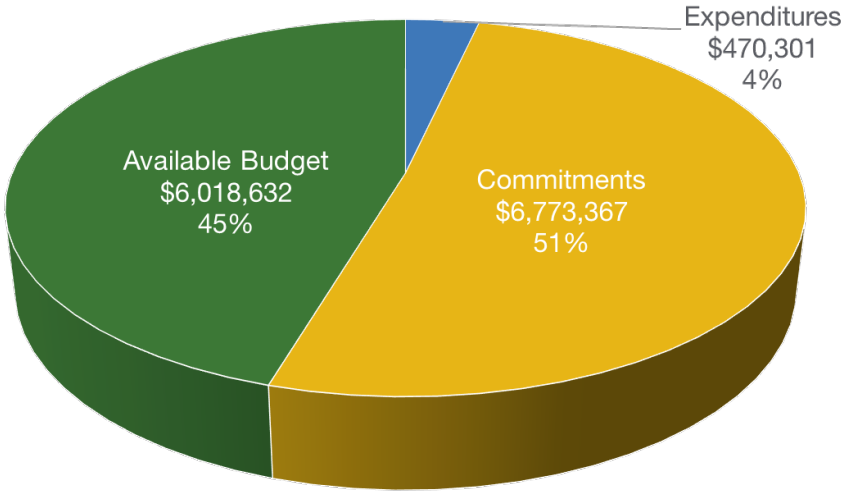
Program Highlights

•	Received:	4 applications this month	38 YTD
•	Approved:	12 applications this month	47 YTD
•	Completed:	4 installations this month	6 YTD

New Construction Programs

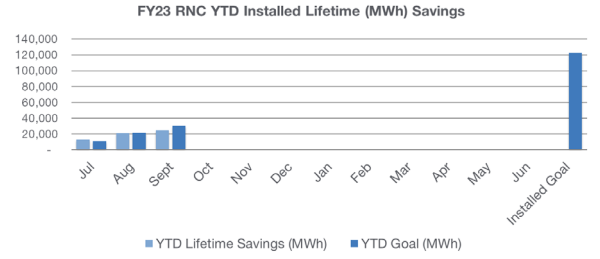
Residential New Construction

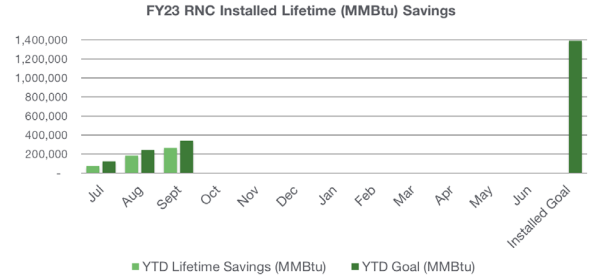
FY23 Incentive Budget: $13,262,300



Program Highlights

- Site Registrations Received/Enrolled: 467
- Site Registrations Approved: 467
- Incentive Applications Received: 331
- Incentive Applications Approved: 117
- Projects Cancelled: 6





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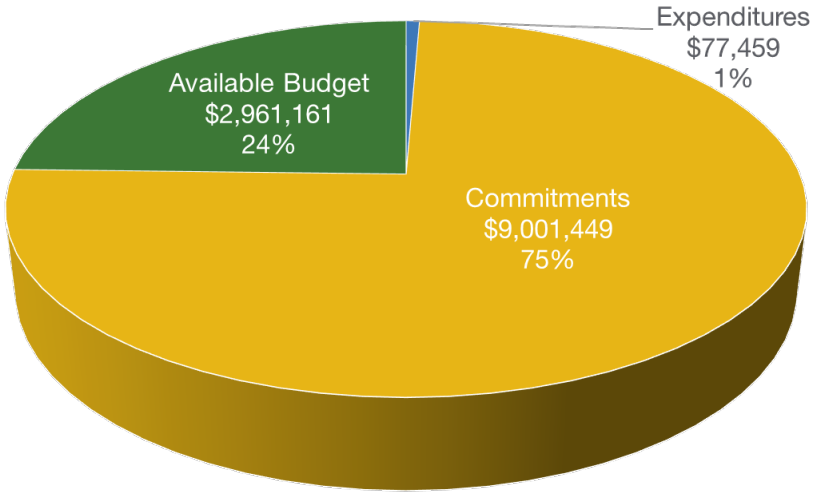
New Construction Programs (cont.)

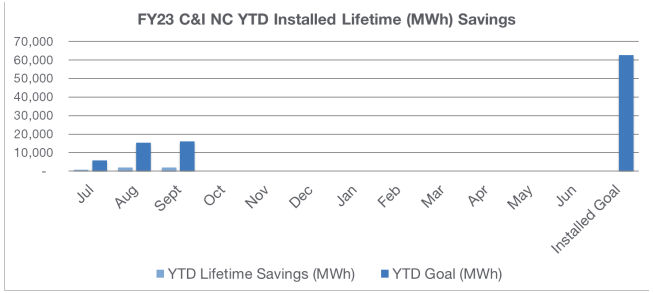
C&I New Construction: P4P NC and C&I NC

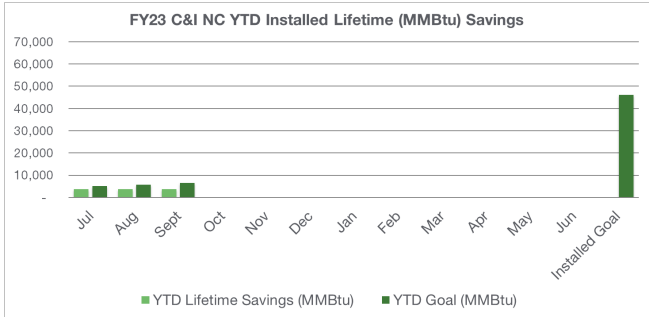
FY23 Incentive Budget: $12,040,069



Program Highlights

- Received: 4 enrollments this month 16 YTD
- Approved: 9 projects this month 26 YTD
- Paid: 0 applications this month 7 YTD



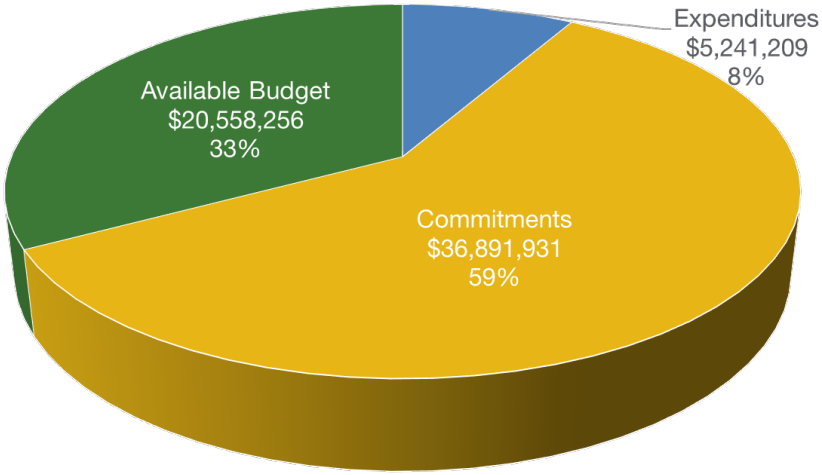


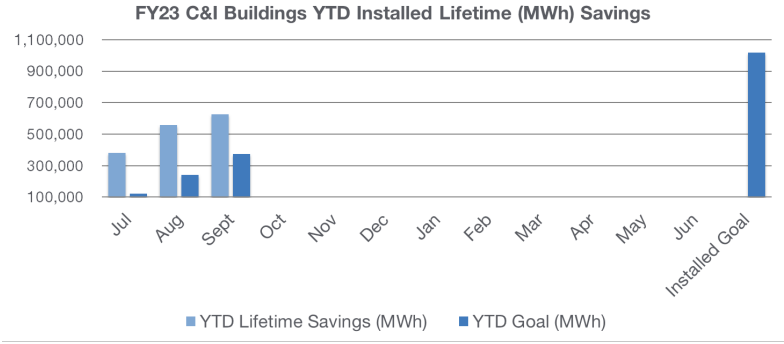
New Jersey's cleanenergy program

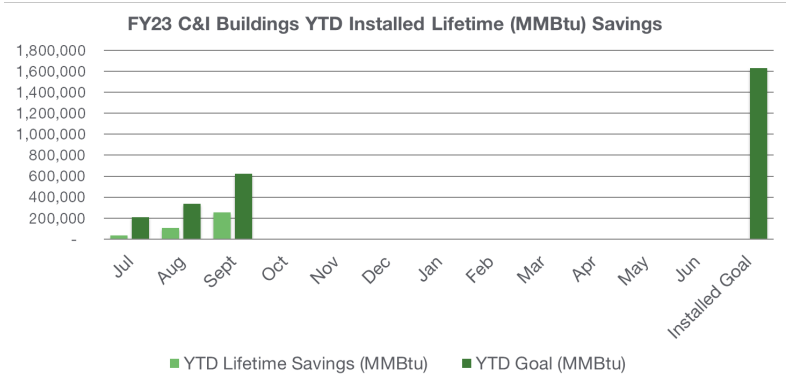
Commercial & Industrial Programs

C&I Buildings: Retrofit, CTEEP, P4P EB, LEUP

FY23 Incentive Budget: $62,691,396







New Jersey's cleanenergy program

C&I Buildings – Program Highlights

Large Energy User Program

• Received:	1 application this month	3 YTD
• Approved:	0 Final Energy Efficiency Plans this month	0 YTD
• Paid:	2 applications this month	5 YTD

Retrofit *(Close-Out Program: transitioning to Utilities)*

• Received:	0 applications this month	0 YTD
• Approved:	0 applications this month	5 YTD
• Paid:	41 applications this month	97 YTD

Pay for Performance Existing Buildings *(Close-Out Program: transitioning to Utilities)*

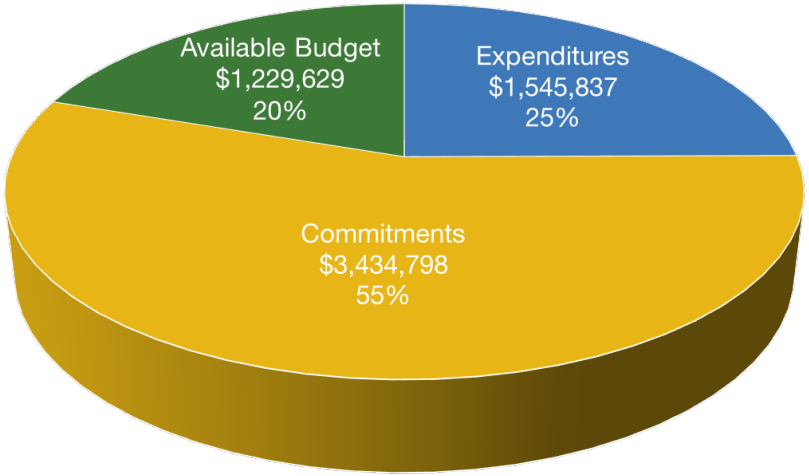
• Received:	0 applications this month	0 YTD
• Approved:	4 Energy Reduction Plans	6 YTD
• Completed:	1 project this month	1 YTD

Customer Tailored Energy Efficiency Pilot *(Close-Out Program: transitioning to Utilities)*

• Received:	0 new enrollments this month	0 YTD
• Approved:	0 applications this month	0 YTD
• Paid:	0 applications this month	4 YTD
• Held:	0 scoping session meetings with customers this month	0 YTD

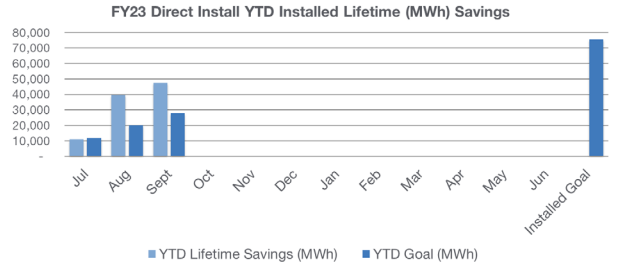
Direct Install *(Close-out Program: transitioning to Utilities)*

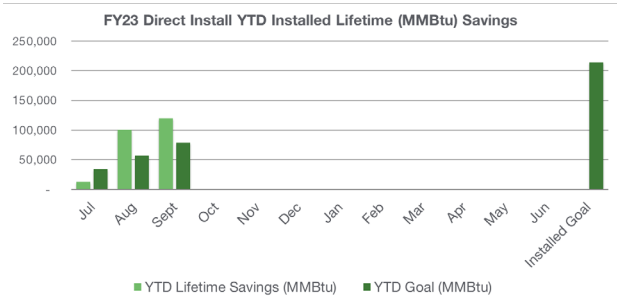
FY23 Incentive Budget: $6,210,263



Program Highlights

- Received: 0 enrollments this month 0 YTD
- Approved: 0 applications this month 0 YTD
- Paid: 10 applications this month 40 YTD





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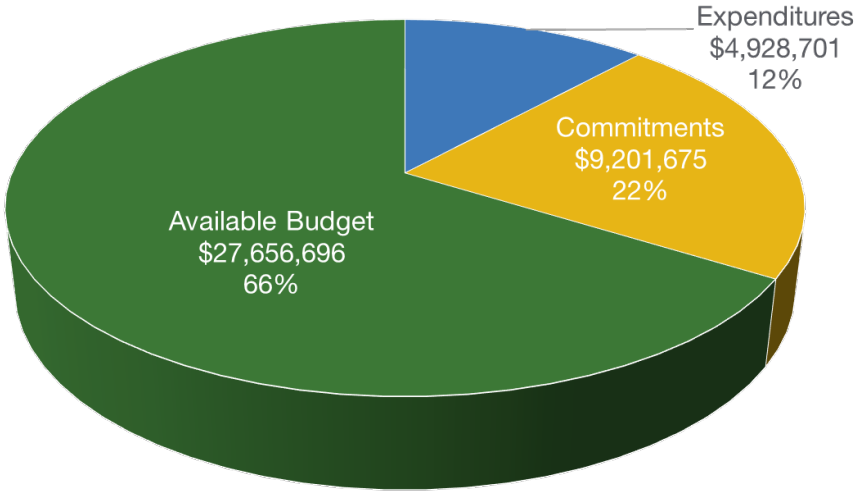
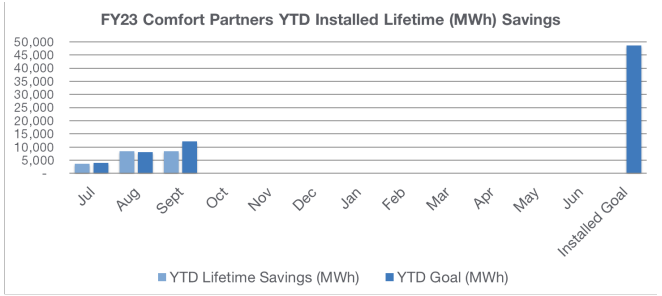
Comfort Partners
BPU/Utility Managed

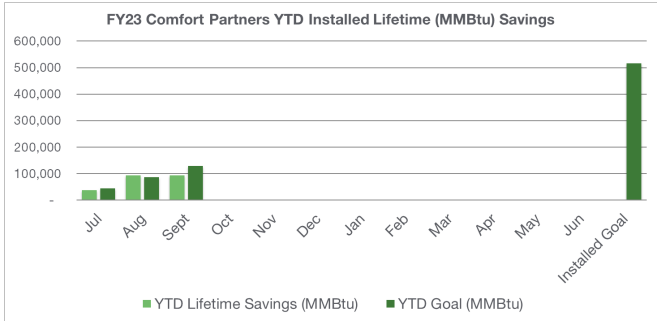
FY23 Incentive Budget: $41,787,072



Program Highlights

- Completed: 306 projects this month 856 YTD





Utility Updates
NJ Energy Efficiency Stakeholder Meeting

October 20, 2022

Reminders

- All of the utilities have launched the programs transitioning from NJCEP
- Reach out to utilities where you may be interested in doing business.
  - Explore the information they have posted and reach out if you have questions.
  - Sign up for any contractor updates if that is available.
  - Build your understanding of utility specific elements (e.g. financing options, online forms)
  - Some programs have specific contractor requirements and may require a Participating Contractor Agreement
- Contact info for all utilities is available on the NJCEP Transition page

Utilities appreciate your patience during this transition
Committed to updating FAQs and materials to provide clarity to customers and contractors

Program Updates

- Recurring joint utility calls to provide program updates and secure feedback on programs
  - **HPwES contractors** – generally held 3rd Thursday of every other month
    - Meeting held earlier today.
  - HVAC contractors-
    - Next meeting scheduled for Thursday November 3rd
  - Reach out to your utility if you are interested in attending future meetings
    - PSE&G in-person Residential Trade Ally networking event scheduled tonight(October 20).
  - Contractors do not need to wait for meetings if they have questions
    - Appreciate the feedback from all contractors and stakeholders who stopped by utility exhibits at the NJCEP conference

Update on HVAC equipment Program Eligibility

- The DOE has adopted a new Federal Standard including new testing procedures for certain Residential type HVAC equipment that will be effective on January 1, 2023
  - Applicable HVAC equipment will be tested and rated to new SEER2, EER2 and HSPF2 efficiency metrics following the new testing procedure, where applicable
- The utilities are in the process of finalizing HVAC program eligibility requirements to recognize the new Federal Standard and efficiency metrics
  - ENERGY STAR has established a new specifications (V6.1) that references the new Federal Standard and new efficiency metrics, also effective January 1, 2023
  - The utilities are adopting the new ENERGY STAR V6.1 specification for HVAC equipment where applicable.
    - Tier 1 Incentives for equipment that meets or exceeds ENERGY STAR V6.1
    - Tier 2 Incentives for equipment that meets or exceeds SEER2 of 17.1 and ENERGY STAR V6.1
- The utilities plan to finalize and communicate the final requirements in November 2022
  - RECO will have variations because of their pilot program

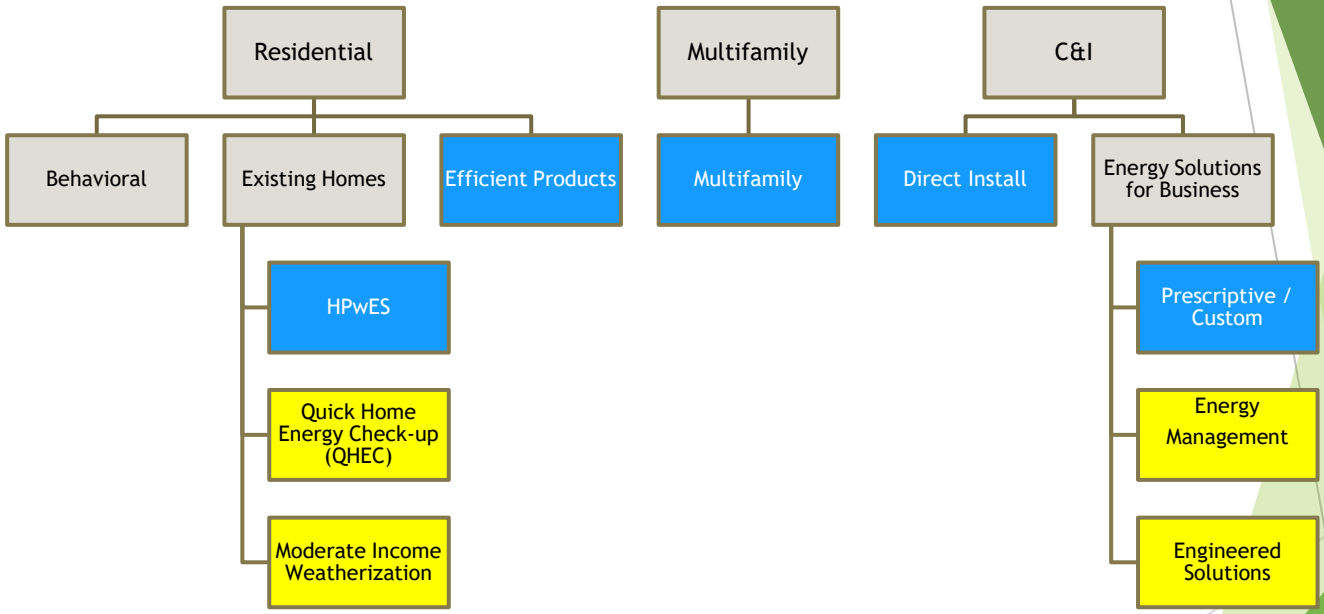
Update on HVAC equipment Program Eligibility

	Measure	Category	UNITARY - AIR CONDITIONERS & HEAT PUMPS - AIR COOLED - NEW SPECIFICATIONS									
			Existing Specifications				New Specifications (1/1/23)				Source	Other Notes:
			SEER	EER	HSPF		SEER2	EER2	HSPF 2			
A/C	Central Air Conditioners - Split System	Tier 1	≥ 16	≥ 12.5	NA		≥ 15.2	≥ 12	NA		EnergyStar	The measure also applies to "ducted" mini-split air conditioning product lines that function as a central home HVAC system.
		Tier 2	≥ 18	≥ 13	NA		≥ 17.1	≥ 12	NA		SEER2 based on existing SEER, EER2 based on ES	The measure also applies to "ducted" mini-split air conditioning product lines that function as a central home HVAC system.
	Central Air Conditioners - Single Packaged	Tier 1	≥ 16	≥ 12.5	NA		≥ 15.2	≥ 11.5	NA		EnergyStar	
		Tier 2	≥ 18	≥ 13	NA		≥ 17.1	≥ 11.5	NA		SEER2 based on existing SEER, EER2 based on ES	
	Ductless Mini-Split Air Conditioners		≥ 20	≥ 12.5	NA		≥ 20	≥ 12.5	NA		Current Specifications Continue	These are SEER, EER and HSPF specifications (not SEER2, EER2 and HSPF2)
Heat Pump	Air Source Heat Pumps - Split Systems	Tier 1	≥ 16	≥ 12.5	≥ 9		≥ 15.2	≥ 11.7	≥ 7.8		EnergyStar	The measure also applies to "ducted" mini-split heat pump product lines that function as a central home HVAC system.
		Tier 2	≥ 18	≥ 13	≥ 10		≥ 17.1	≥ 11.7	≥ 7.8		SEER2 based on existing SEER, EER2 and HSPF2 based on ES	The measure also applies to "ducted" mini-split heat pump product lines that function as a central home HVAC system.
	Air Source Heat Pump - Single Packaged	Tier 1	≥ 16	≥ 12.5	≥ 9		≥ 15.2	≥ 10.6	≥ 7.2		EnergyStar	
		Tier 2	≥ 18	≥ 13	≥ 10		≥ 17.1	≥ 10.6	≥ 7.2		SEER2 based on existing SEER, EER2 and HSPF2 based on ES	
	Ductless Minisplit Heat Pump	Multihead	> 18	≥ 12.5	≥10		> 18	≥ 12.5	≥10		Current Specifications Continue	These are SEER, EER and HSPF specifications (not SEER2, EER2 and HSPF2)
		Singlehead	≥ 20	≥ 12.5	≥ 10		≥ 20	≥ 12.5	≥ 10		Current Specifications Continue	These are SEER, EER and HSPF specifications (not SEER2, EER2 and HSPF2)
	Air Source Heat Pump - Cold Climate	Ducted	16	12.5	9	COP at 5F > 1.75	≥ 15.2		≥ 8.1	COP at 5F > 1.75 and provide 70% capacity maintenance at 5 degrees F.	EnergyStar	

Equipment meeting the existing specification will continue to be eligible to allow equipment manufactured prior to 1/1/23 to be installed

Overview of Commercial Programs

Program Structure



Core Programs shown in blue but yellow boxes may have cross utility impacts too.

Direct Install- approach

- Intended to be a comprehensive approach for smaller commercial facilities
  - Up to annual average demand of 200 kW or less
- Focus on lighting, heating, cooling & refrigeration plus other measures
  - Work with a single utility to access both gas and electric measures
- Customers must work with a participating contractor
  - Not a “closed” network
- Utilities are in discussion with BPU staff to explore a streamlined approach that can satisfy public procurement requirements

Contact your local utility to find participating contractors or if you are interested in becoming a participating contractor

Direct Install- incentives

- Incentive levels based on the level of comprehensiveness of a project
- Rebates up to 80% of retrofit costs
- 5-year 0% APR financing – either an On- Bill Repayment Program or external loan
- Tier I
  - Businesses up to 100 kW average annual electric demand
  - Municipal, public k-12 educational facilities up < 200 kW
  - Businesses in Urban Enterprise Zones < 200 kW
- Tier II
  - Medium size business with an average annual electric demand of 101 – 200 kW

Prescriptive

- Parallel to prior “NJCEP Smart Start Buildings”
  - Single/multiple pieces of equipment
  - Includes lighting, appliances, heating, cooling & food services and other measures
- Open contractor network for rebates
  - If interested in financing, may need to work with a participating contractor
- Incentives
  - Rebates to reduce costs of approved high-efficiency equipment
  - 0% APR financing through either an On Bill Repayment Program or external loan
    - Up to $150K for a 5-year term

Contact your local utility for more specific information on rebates and terms and conditions

Custom

- Parallel to prior “NJCEP Smart Start Buildings”
  - Intended for newer measures, measures with variable savings or specific technologies that aren’t included in the Technical Resource Manual
  - Special projects that can demonstrate energy savings
- Open contractor network for rebates
  - If interested in financing, may need to work with a participating contractor
- Incentives
  - Rebates to reduce costs of approved high-efficiency equipment or projects
  - 0% APR financing through either an On Bill Repayment Program or external loan
    - Up to $250K for a 5-year term

Energy Management

- Additional Utility Led Offering
  - Can be differences between the utilities
- Holistic solutions to improve building energy performance
- Program is designed to optimize the performance of existing equipment and building systems
- Can include
  - HVAC Tune-Up and Building Tune-Up
  - Retro-commissioning
  - Strategic Energy Management (larger customers)
- Incentives
  - Rebates
  - On-Bill Repayment or external loans at 0% APR
  - Training Resources

No direct comparison to previous NJCEP programs

Engineered Solutions

- Tailored energy efficiency solutions for larger commercial customers in targeted segments
  - Municipalities, universities, schools, hospitals, healthcare, and non-profits
- Comprehensive solutions
  - Can work with one utility to access gas and electric incentives
  - Much longer lead times
    - Extensive engineering work
    - Lead time for ordering equipment

No direct comparison to prior NJCEP programs but PSE&G, NJNG and SJG had this program

Engineered Solutions

- Key steps
  - An initial audit to identify the savings opportunities
  - Design a more detailed plan to develop cost effective solutions and calculate incentives
    - Buy-down initial cost
    - 0% APR for On Bill Repayment/external financing at a 5-year term
  - Construction of the Project
  - Commissioning
  - Measurement and Verification
- Utilities assign the firms performing the engineering work
- Customers competitively bid the project work

Questions?

New Construction Program Update

New Construction Program Update

- Stakeholder Meeting held July 22nd, recording on website: NJCleanEnergy.com/Policy-Updates
- Comments received (deadline July 29th)
- Comments have been reviewed
- Ongoing discussions with Staff re: program changes / responses to comments

Next steps

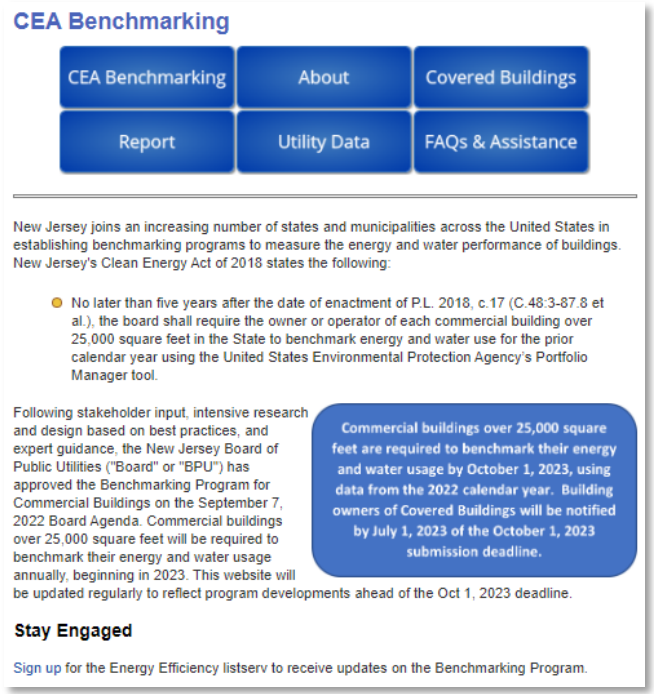
- Finalize program design
- Release for public comment as Compliance Filing update

Benchmarking

Benchmarking Update

September 7th - Board approved CEA benchmarking program

Updated website:
NJCleanEnergy.com/Energy-Benchmarking



CEA Benchmarking

CEA Benchmarking | About | Covered Buildings
Report | Utility Data | FAQs & Assistance

New Jersey joins an increasing number of states and municipalities across the United States in establishing benchmarking programs to measure the energy and water performance of buildings. New Jersey's Clean Energy Act of 2018 states the following:

- No later than five years after the date of enactment of P.L. 2018, c.17 (C.48:3-87.8 et al.), the board shall require the owner or operator of each commercial building over 25,000 square feet in the State to benchmark energy and water use for the prior calendar year using the United States Environmental Protection Agency's Portfolio Manager tool.

Following stakeholder input, intensive research and design based on best practices, and expert guidance, the New Jersey Board of Public Utilities ("Board" or "BPU") has approved the Benchmarking Program for Commercial Buildings on the September 7, 2022 Board Agenda. Commercial buildings over 25,000 square feet will be required to benchmark their energy and water usage annually, beginning in 2023. This website will be updated regularly to reflect program developments ahead of the Oct 1, 2023 deadline.

Commercial buildings over 25,000 square feet are required to benchmark their energy and water usage by October 1, 2023, using data from the 2022 calendar year. Building owners of Covered Buildings will be notified by July 1, 2023 of the October 1, 2023 submission deadline.

Stay Engaged

Sign up for the Energy Efficiency listserv to receive updates on the Benchmarking Program.

New Jersey's cleanenergy program™

Benchmarking Implementation

Next Steps - Implementation

Date	Action
Sep 2022 - Oct 2023	BPU develops benchmarking regulations
	BPU and the New Jersey Institute of Technology (NJIT) develop benchmarking certification program
	BPU conducts outreach and training webinars with building owners and operators
	BPU and NJIT develop training materials on Portfolio Manager
Jul 01, 2023	BPU notifies building owners and operators of upcoming benchmarking submission deadline
Aug 01, 2023	Regulated utilities provide data access services
Oct 01, 2023	First benchmarking data submission deadline for building owners and operators for calendar year 2022

New Jersey's cleanenergy program™

Working Group Updates

Working Groups

Four Energy Efficiency Working Groups were identified in the June 10, 2020 Board Order to refine the programs through the transition. The current working groups are as follows:

- **Workforce Development Working Group**
- **Equity Working Group** (Comfort Partners Committee and Multifamily Committee)
- **Marketing Working Group**
- **Evaluation, Measurement, and Verification Working Group** (Technical Reference Manual Committee and NJ Cost Test Committee)

Workforce Development Working Group

- Develop recommendations for establishing coordinated and collaborative workforce development and job training pathways statewide
- Focus on providing economic opportunities for underrepresented and socially or economically disadvantaged individuals

New Jersey's cleanenergy program

Equity Working Group

- Develop recommendations to integrate equity metrics and approaches in energy efficiency and peak demand reduction programs
- Collaborate with Supplier Diversity Development Council to encourage supplier diversity
- Encourage contractor coaching/mentoring of diverse enterprises

Comfort Partners Committee: Oversee Comfort Partners Program and utilities' day-to-day operations

Multifamily Committee: Design and manage delivery of multifamily sector with goals of equitable access and adequate program support

Marketing Working Group

- Promote the programs, overall state brand (utilized by all program administrators), and the larger benefits of participation in EE and PDR programs. Engage in a collaborative effort in branding, messaging, and promotion of all utility- and State-led programs, including in the provision of program materials in Spanish and languages other than English. Staff shall leverage State resources to promote general awareness of EE and other clean energy opportunities in NJ while the utilities shall market specific programs and initiatives to customers in a more targeted fashion

Evaluation, Measurement, & Verification Working Group

- Provide guidance and input on the planning and monitoring of EM&V plans (including activities, methodologies, budgets, priorities), policies, procedures, guidelines, requirements for program administrators (including data to be tracked and reported, such as GHG emissions reductions, BTU savings, local worker job-hours, supplier diversity), methods to account for strategic electrification, and schedules.
- Provide recommendations on development of a standard, transparent, and replicable approach for EM&V across the state, according to which the State and utilities will be held to the same accountability standards such as the frequency and transparency of reporting and vendor procurement requirements.
- Share associated data, track best practices from other jurisdictions, emerging EM&V approaches and facilitate the necessary stakeholder processes related to the State's EM&V policies.

October 12th Board Order Update

Overview of recently completed studies:

- Residential lighting
- Non-residential lighting
- C&I industry standard practice

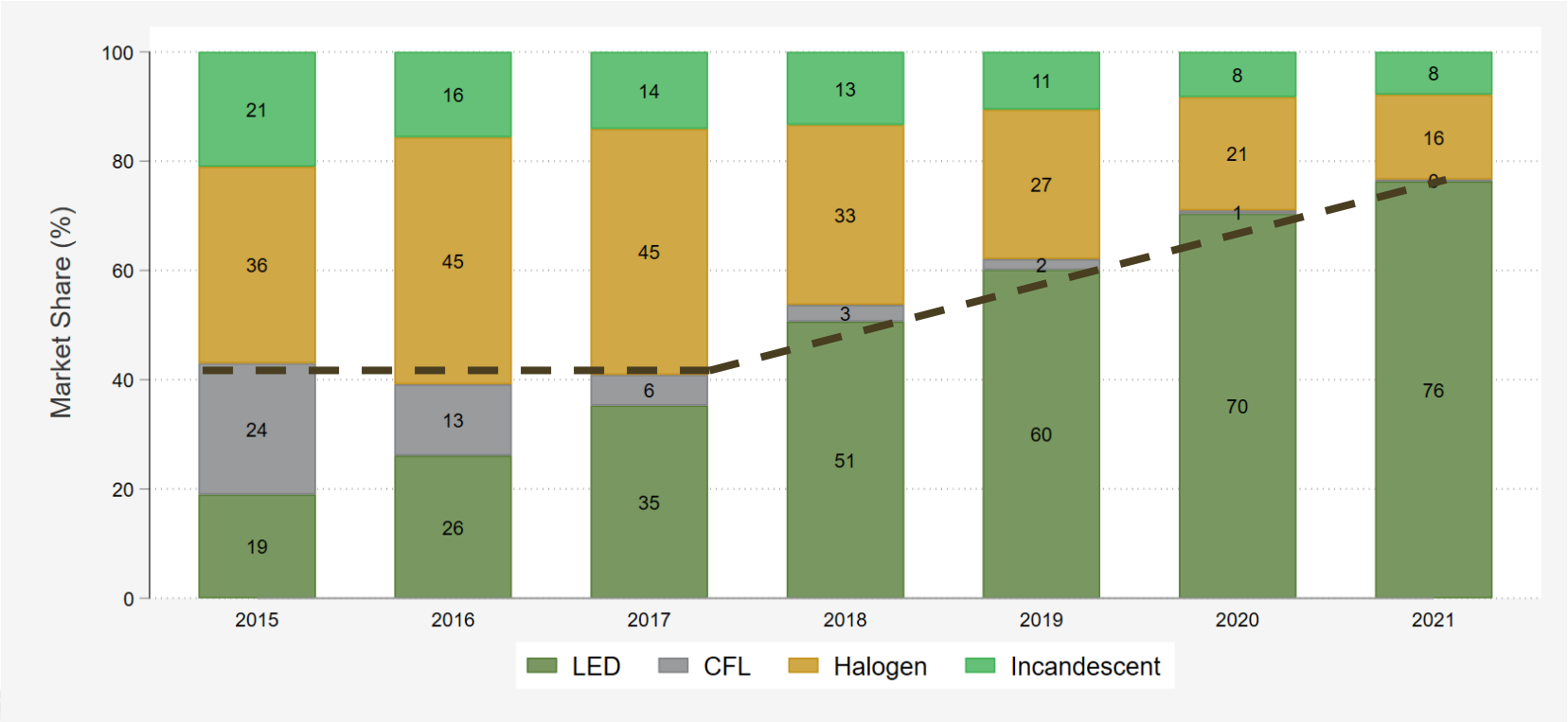
New Jersey Residential Lighting NTG

June 21, 2022

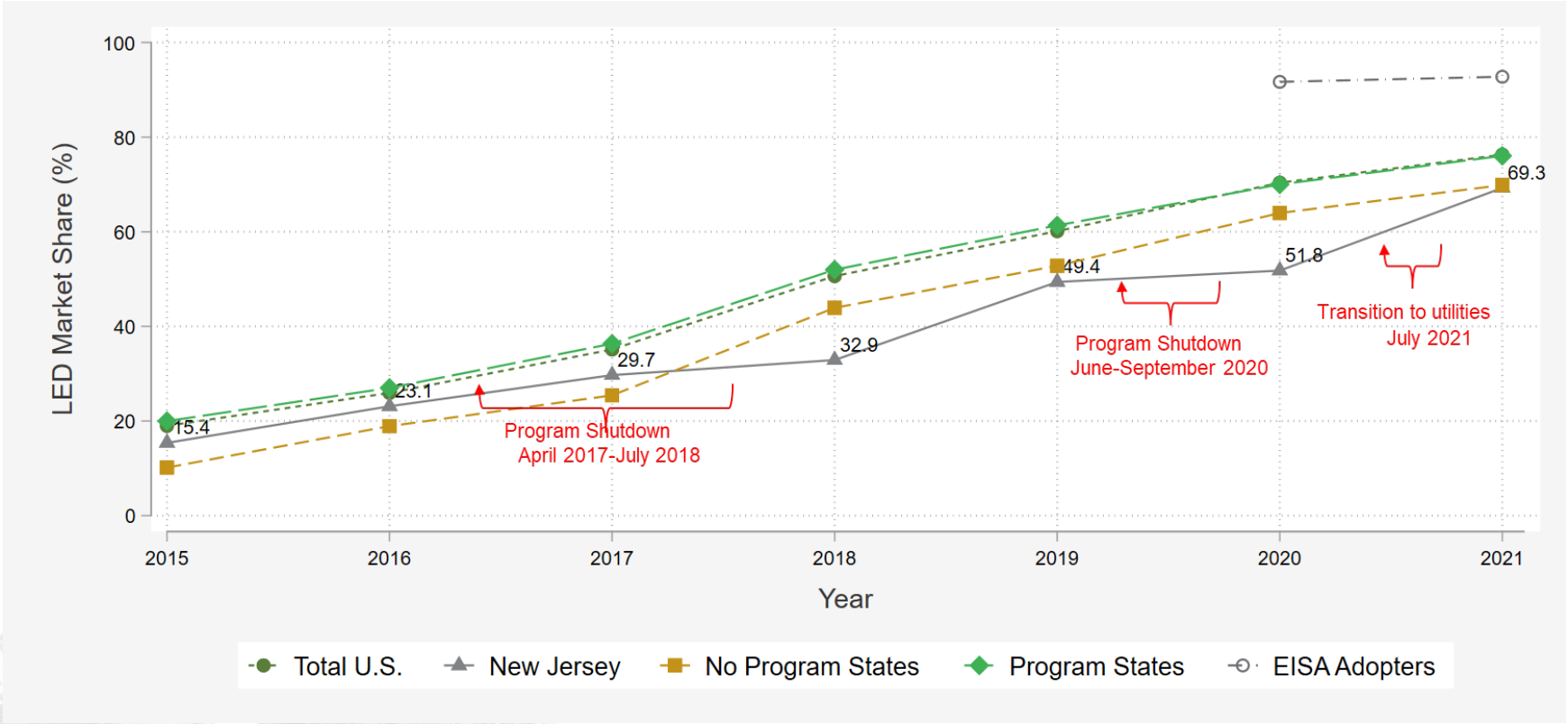
APEX ANALYTICS

Key Findings from Market Data

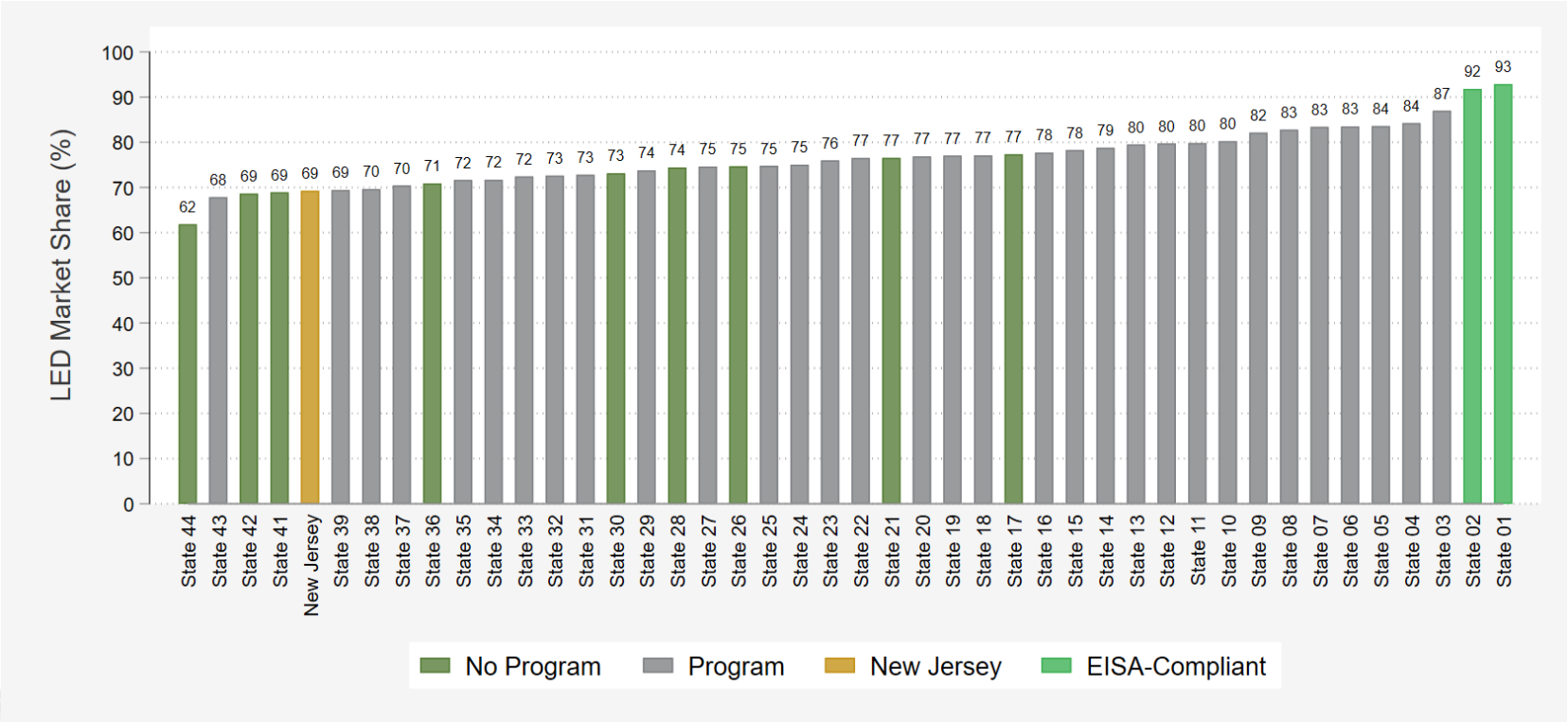
Lighting Market Share Over Time – All States



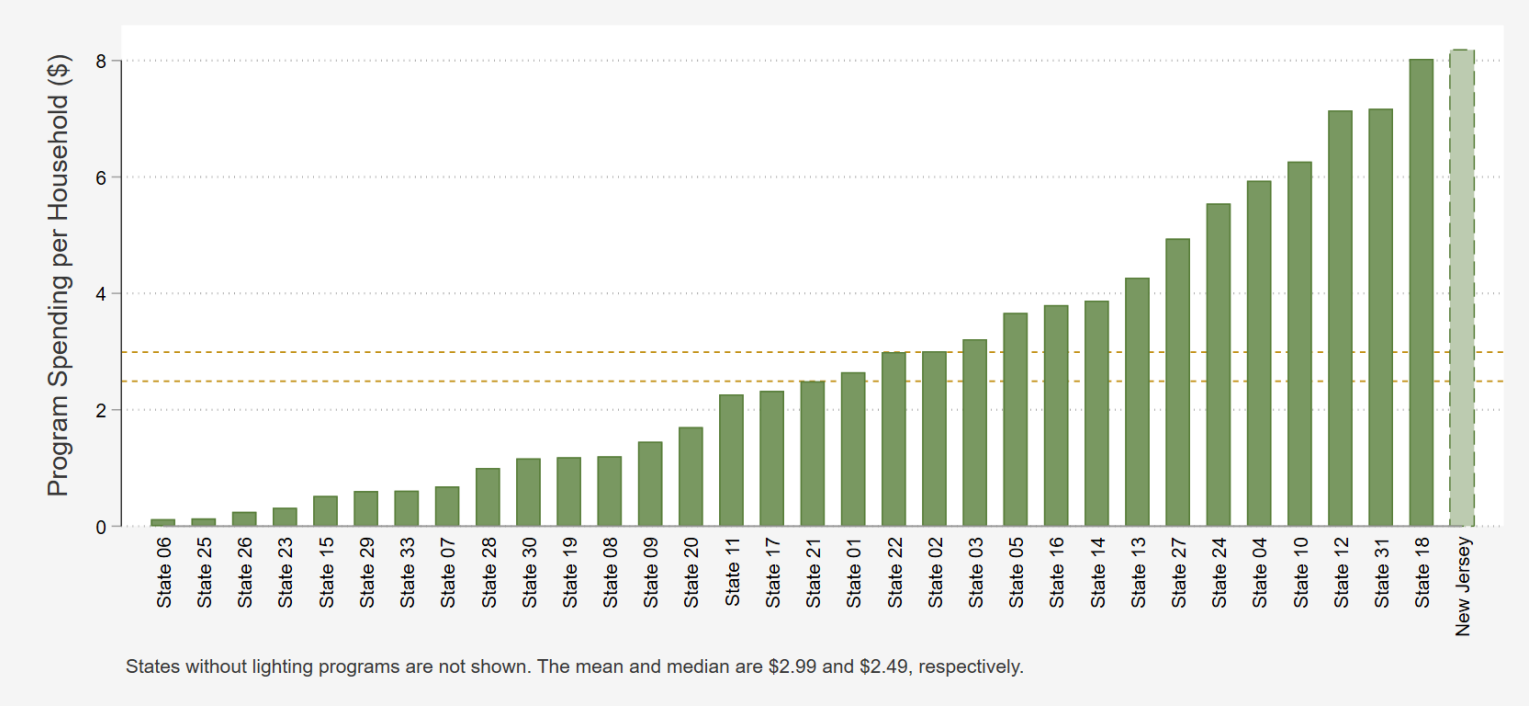
LED Market Share over Time – New Jersey vs U.S.



2021 LED Market Share by State

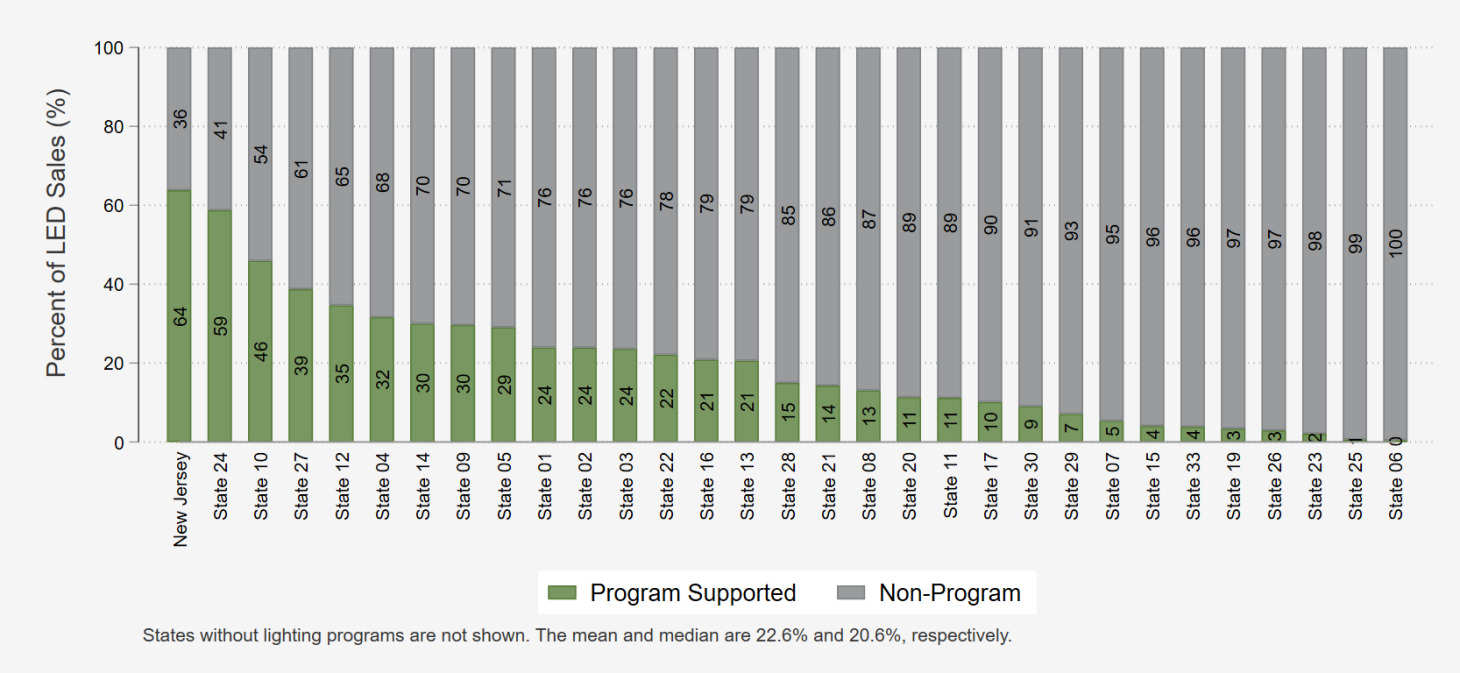


2021 Program Spending per Household



States without lighting programs are not shown. The mean and median are $2.99 and $2.49, respectively.

Percentage of LED Sales Supported by Upstream Lighting Program



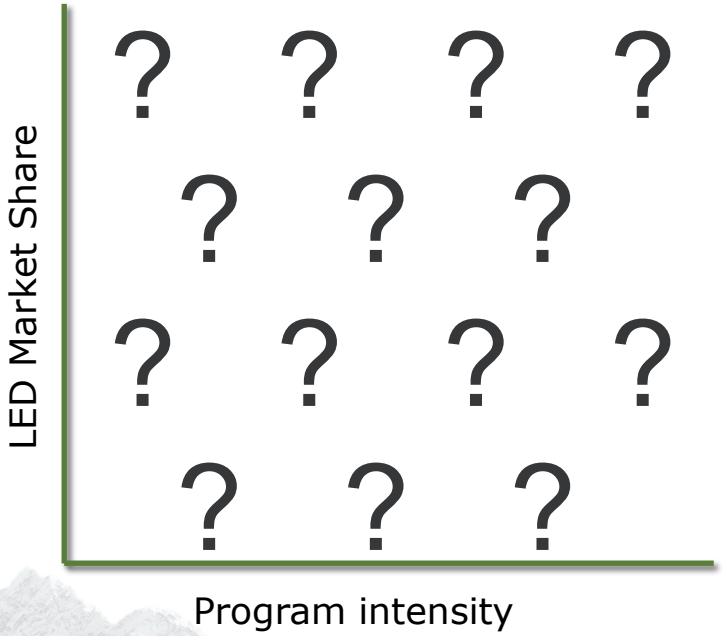
States without lighting programs are not shown. The mean and median are 22.6% and 20.6%, respectively.

APEX ANALYTICS

NTG Methodology

NTG Analysis

- Quantify the relationship between program intensity and LED Market Share and then estimate program Net-to-Gross ratios



Input Variables

- Model explains the variation of LED market share as a function of program intensity and other variables

$$LED\ Market\ Share_i = \beta_0 + \beta_1 * \sum Program\ Intensity\ Variables + \beta_2 * \sum Channel\ Variables + \beta_3 * \sum Demographic\ Variables$$

Program Intensity	Retail Channel Variables	Demographic Variables
Program Spending per HH	Square Footage of POS Retailers per HH	Political Index
SQRT(Program Spending per HH)	Square Footage of non-POS Retailers per HH	Median Income
Program Age (Years)	% of Retail Square Footage that is non-POS	Average Price of Electricity
SQRT(Program Age)		Cost of Living
		% of Renters that Pay Utilities
		% Owner Occupied Households
		% of Population with College Degree

NTG Approach

- Model “with” vs. “without” program
- Calculate the program “lift”
- Divide by actual claimed sales (gross bulbs)

$$NTGR = \frac{(\#\ bulbs\ sold\ with\ program - \#\ bulbs\ sold\ with\ no\ program)}{\#\ of\ program\ incented\ bulbs\ sold}$$

NTG Results

NTG Model

- Model selected uses three variables
- Program spending and EISA most important
- Excluded program age (complex given program history)

Independent Variables	Model Coefficient	P-Value of Coefficient
Intercept	0.7146	0.000
Program Spending per Household (square root)	0.0165	0.053
Non-POS Square Feet per Household	0.0053	0.700
EISA Indicator Variable	0.1926	0.000
Model Adjusted R-squared	**62.3%**	

NTG Results for 2020-2021

- Market lift about the same
- Gross bulbs ***and*** the counterfactual share increase

Value	CY 2020	CY 2021
Program Intensity		
Program $ per Household	$4.42	$8.18
Gross Program LEDs	8,035,553	12,620,058
Net-to-Gross		
LED Counterfactual Share	66.4%	73.6%
LED Modeled Share	71.0%	78.3%
Lift in LED share	4.6%	4.7%
NTG Ratio	**16.4%**	**10.7%**

Questions?

WHEN TRUST MATTERS

New Jersey Non-Residential Lighting Market Characterization and Commercial ISP Studies

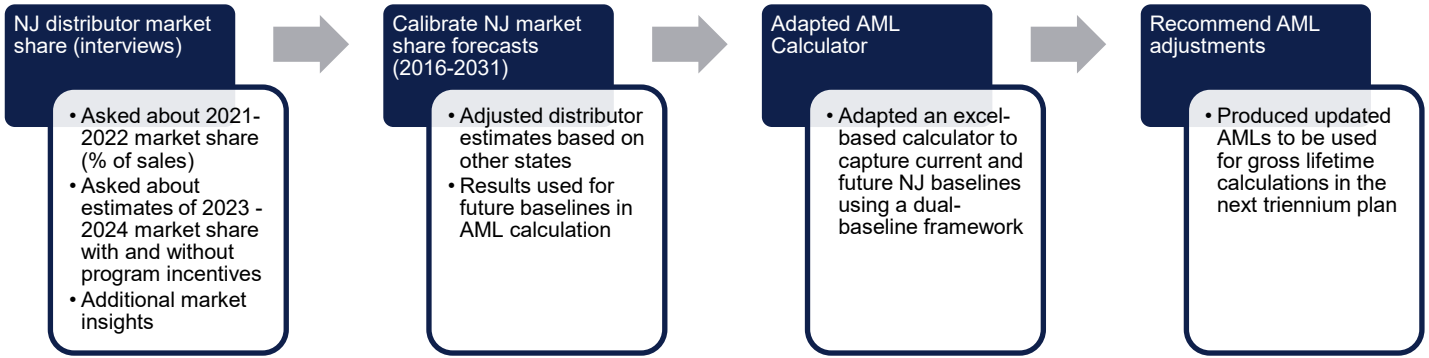
New Jersey Monthly Energy Efficiency Stakeholder Meeting

20 October 2022

New Jersey Non-Residential Lighting Market Characterization

Project Objective & Summary of Approach

Primary Objective: to characterize the current and future status of the New Jersey non-residential lighting market by benchmarking market share. The key output of this effort is adjustments to the *adjusted measure lives (AML)* used to calculate gross lifetime savings.



Distributor Sample Frame and Design

Objective:

- IDIs with distributors to estimate distributor-reported market share.
- Survey also collected COVID-19 impacts, comparisons to other jurisdictions, and qualitative information on high/low bay and exterior/outdoor submarkets.

Frame:

- Participating distributors
  - List of midstream participants on utility websites
- The non-participant distributors were pulled from a ZoomInfo search based on SIC codes 5063 or NAICS code 4236.

Distributors estimates are not direct inputs into the AML calculations but rather are used, along with information from other areas and distributor reported differences between states, to inform future baselines.

	Sample Frame	Target	Complete
Participant	44	16	12
Non-Participant	25		4

Comparison to National Market

- Of those somewhat to very familiar with the national market (n=10):

  4 think that NJ is ***slightly ahead*** of the national market in terms of LED adoption
  4 think the state is ***consistent*** with national average
  2 think the state ***lags behind*** national average

Comparison to Massachusetts Market

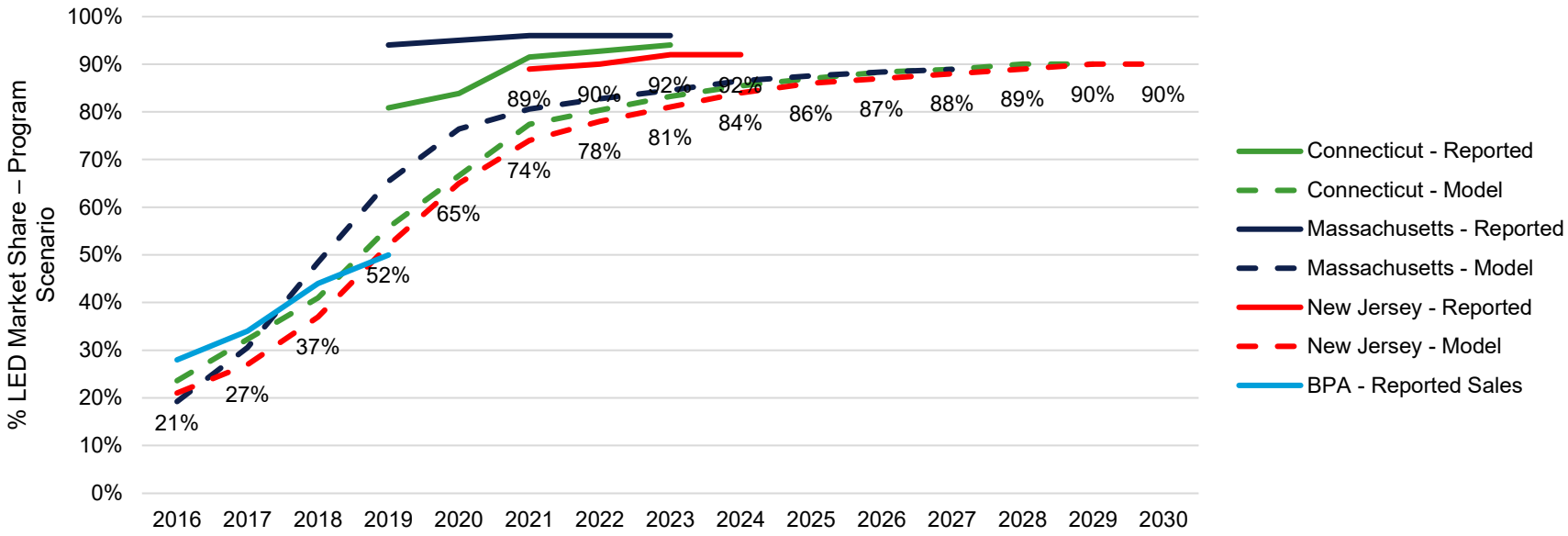
- Of those somewhat familiar with the Massachusetts market (n=8):

  1 thinks ***NJ is ahead*** of MA in terms of LED adoption
  1 thinks the states seem ***similar***
  6 think that ***NJ is slightly behind*** MA

Comparison to Massachusetts included so that New Jersey results can be benchmarked against large volume of data collected in Massachusetts.

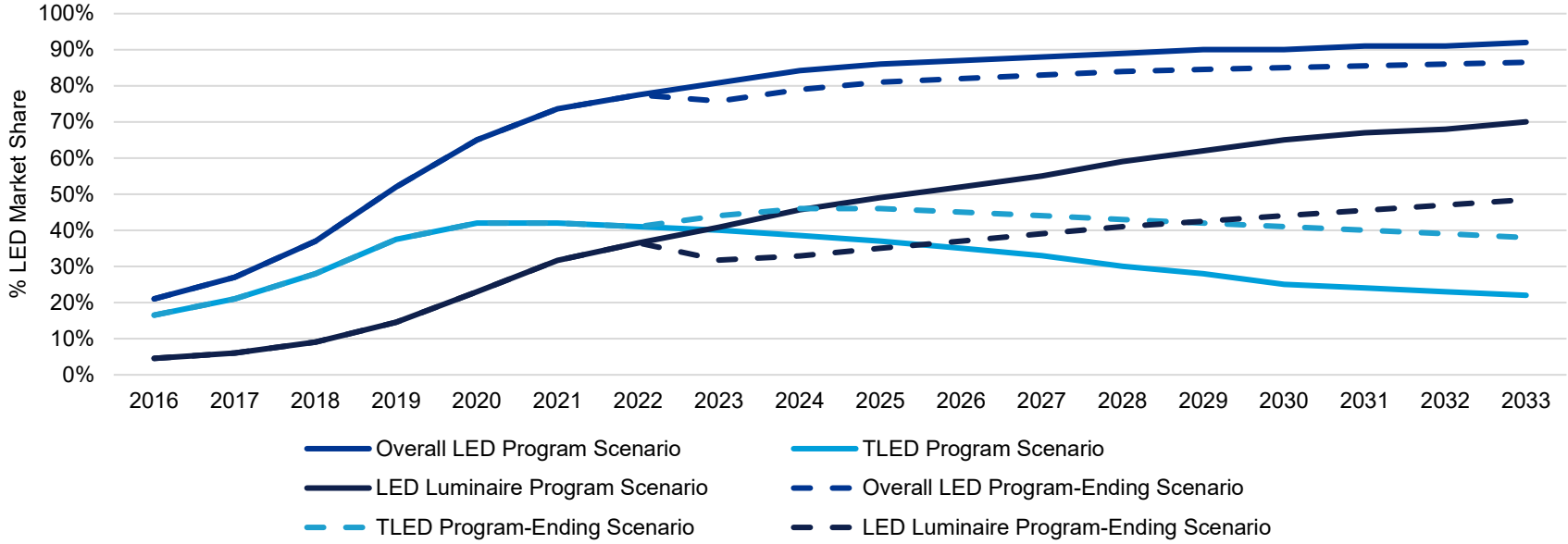
DNV

Calibrating NJ Overall Distributor Market Share



- Distributors likely overstate LED market share due to the types of customers (large projects) they serve and respondents are mostly participating distributors
- 2019 MA study also indicates distributors tend to overstate overall LED market share – used a similar adjustment factor
- Distributors qualitatively suggest that New Jersey has traditionally lagged Massachusetts

Program versus Program-Ending Forecasts



- Magnitude of overall LED market share differences based on distributor reported differences in scenarios
- Programs are effective in pushing LED luminaires over TLEDs. In absence of program, cost differences maintain higher TLED market share compared to LED luminaires.
- This graph does not take into consideration change in total volume of LED sales with and without the program

High/Low Bay

- 8 out of 14 respondents would expect a significant decline in the LED high/low bay submarket in the absence of a utility program. 2 would expect a slight decline and 4 would expect little to no change
- Many respondents noted the high share of LEDs specifically in the high bay market, with 3 respondents estimating 65%, 80%, and 99% penetration.

Exterior/Outdoor

- 10 out of 14 respondents would expect a significant decline in the LED exterior submarket in the absence of a utility program. 4 would expect a slight decline
- Several respondents (n=2) noted parking lots present opportunity for LEDs. 2 respondents estimated the penetration of LEDs in the exterior submarket to be at least 80% and 96%.

Distributor indications that the market would decline significantly in the absence of a program provides some evidence that AMLs in these submarkets should be slightly longer.

DNV

What is an AML?

Gross lifetime savings are calculated as first-year savings (adjusted for baseline) x EUL (lifetime)

Complicated for these lighting measures because:

- lighting is subject to dual-baseline principles – early replacement (ER) and replace-on-failure (ROF)
- baselines are changing quickly as the market transforms

The easiest way to calculate lifetime savings in existing tracking systems is through an AML.

Adjusted measure life (AML) ≠ expected useful life (EUL)

- EUL: average amount of years that a measure is estimated to function when installed
- AML: the ratio of lifetime savings of the measure to the first-year savings

$$Adjusted\ Measure\ Life = \frac{Lifetime\ Savings_{Program}}{First\ Year\ Savings_{Program}}$$

Recommended AMLs

Measure Group	2023	2024	2025	Average
TLED	5.1	5.1	5.3	**5.2**
LED Luminaire	5.4	5.4	5.5	**5.4**
LED Luminaire w/Control	6.5	6.6	6.7	**6.6**

Retrofit Recommendation: AML of 5.2 years for TLEDs, 5.4 years for LED Luminaires, and 6.6 for LED Luminaires w/Controls

- Blended lifetime that takes into account both replace-on-failure (ROF) and early-replacement (ER) event types.

New Construction: savings are based on code triggering events, so in the absence of site-specific information, recommend using 11.4 years

- Based on an LED rated for 50,000 hours and a weighted building hours of use of 4,400 hours.

The methodology for calculating AMLs relies on the same approach as was used to develop AMLs in Massachusetts and Connecticut.

New Jersey Non-Residential Industry Standard Practice (ISP) Assessment

ISP Analysis Overview

- **Objective:** Leverage data collected for the NJ Energy Code Compliance (ECC) study to assess ISP for commercial new construction measures where there is sufficient data.
- **Industry standard practice (ISP)** – the equipment or practice specific to the application or sector that is commonly installed absent program intervention.
  - Cannot be observed directly, but we can use observations as proxy
  - Results will estimate percentage better or worse than code for selected measures.
    - Generally, this is the ratio of rated efficiency to the building code minimum requirements

- **Program eligibility review** – DNV reviewed each piece of equipment (primarily HVAC) against prescriptive program eligibility requirements. ***Eligible*** equipment meets program requirements and ***ineligible*** equipment does not meet requirements.

ISP approaches for New Jersey commercial new construction

Best – Program Ineligible Equipment

- Program ineligible median efficiency (or pct better than code)

Proxy A – Non-Participant

- Non-participant median efficiency (or pct better than code)

Proxy B – All Sites

- Combined Participant and Nonparticipant median efficiency (or pct better than code)

Program participation summary

NJ commercial new construction program:

- NJCEP runs all commercial new construction programs in NJ. Utilities do not run NC programs
  - Equipment-specific prescriptive incentives for most HVAC equipment
  - Whole building and lighting programs are performance-based, not useful for measure-level ISP

Challenges:

- Limited NC program participation during study period; lack of specific program participation measure details
- No recent evaluations/NTG studies
- ***Outcome: No participants included in ISP assessment***

ECC Study participation summary

Building category	Participants	Nonparticipants	Total	Participant percentage of square footage
Envelope	0	43	43	0%
HVAC	1	42	43	0.17%
Lighting	3	36	39	2%

Lighting ISP results

- Lighting power density (LPD) exceeded code requirements for both interior and exterior lighting designs.
- Recommend adjusting code baselines to reflect ISP.

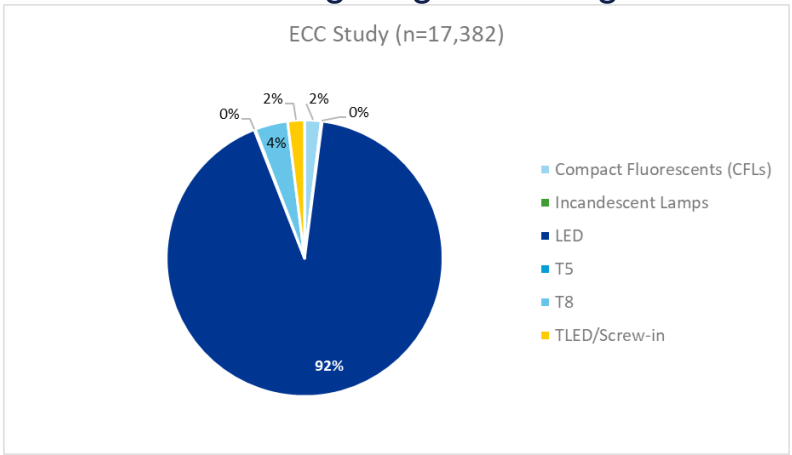
Interior LPD

Results	Number of Sites	Median % better/worse than code	Bounds @ 90% confidence level
Non-Participant ISP Metric	36	40%	20%/61%
Participants	3	77%	n/a

Exterior LPD

Results	Number of Sites	Median % better/worse than code	Bounds @ 90% confidence level
Non-Participant ISP Metric	36	60%	30%/90%
Participants	3	54%	n/a

Interior lighting technologies



Envelope ISP results

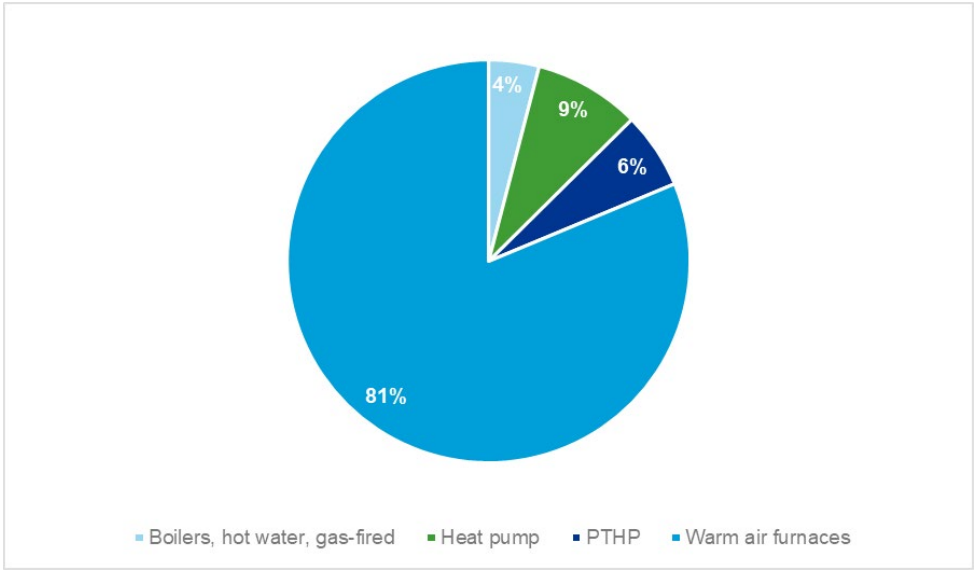
- Window u-factors only observable for 59% of study square footage, but nonparticipant median better than code (31%). Recommend adjusting baseline to ISP.
- Walls and roofs have data available for all sites, but confidence bounds show potential for ISP to be better or worse than code. Consider additional analysis of these measures to estimate ISP.

Median nonparticipant ISP metrics for envelope

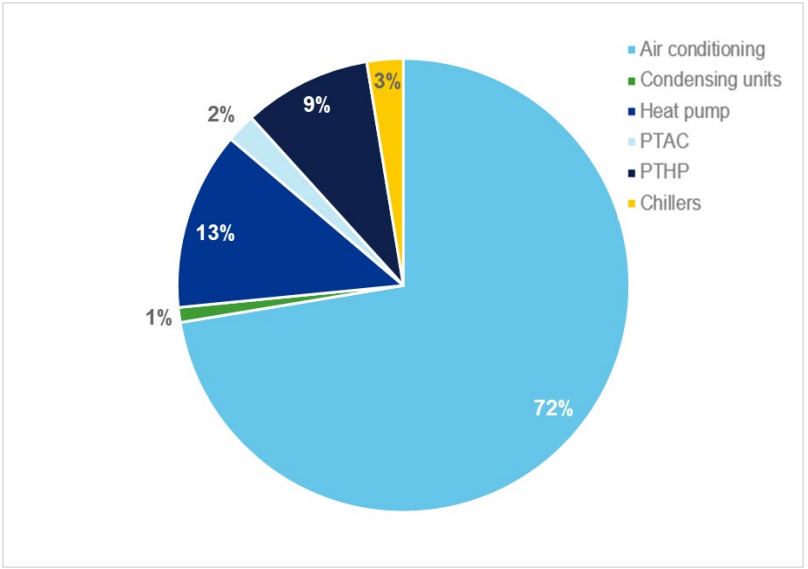
Envelope component	Number of sites	Median % better/worse than code	Bounds @ 90% confidence level
Roof	43	-15%	-36%/6%
Wall	43	6%	-4%/16%
Window u-factor	17	31%	18%/44%

HVAC equipment observations

Area served by equipment – heating*



Area served by equipment - cooling



* Oil-fired boilers and unit furnaces each comprised <1% of area served

HVAC ISP Results

- **Warm air furnaces** ISP **(**ineligible equipment median) is 15% better than code, we recommend adjusting baseline to ISP.
- **Air conditioning** – ineligible equipment worse than code, so no changes to code baseline but opportunity for industry training/education.
- **Heat pump** results are mixed. We recommend a follow-up heat pump measure study to estimate ISPs.
- Other equipment need more data to assess ISP.
  - Boilers, chillers, packaged terminal air conditioners (PTAC), packaged terminal heat pumps (PTHP)

Study Recommendations

- **Adjust code baselines to reflect ISP where better than code:**
  - *Lighting*: Interior (+40%) and exterior (+60%) LPD
  - *Envelope*: Window u-factor (31% better than code)
  - *HVAC*: Warm air furnaces (15% better than code)
- **Develop targeted code training** to improve performance for ISPs potentially worse than code:
  - Envelope components (roofs/walls), Air conditioning, PTAC/PTHP
- **Conduct additional measure-specific analyses** to develop ISP estimates:
  - *Heat pumps:* Heating ISP better than code, cooling inconclusive. Targeted measure study should be done to better understand ISP.
  - PTAC & PTHP: observations consolidated at small number of sites, more data needed to establish ISP.
  - Boilers and chillers: We did not have sufficient data to estimate ISP.

Thank you!

Geoffrey Cooper, Geoffrey.Cooper@dnv.com

Ari Michelson, Ari.Michelson@dnv.com

www.dnv.com

DNV

Clean Energy Conference

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/StakeholderGroups/Energy-Efficiency

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

[no November meeting]

December 15, 2022

More Information

VISIT

NJCleanEnergy.com

NJCleanEnergy.com/StakeholderGroups/Energy-Efficiency

CONTACT

EnergyEfficiency@bpu.nj.gov

866.NJ.SMART (657.6278)

EE LISTSERV

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THANK YOU