



New Jersey Energy Code Collaborative

In-person Meeting

October 20, 2025



Agenda



1:00pm	10 minutes	Welcome and Introduction	BPU/Rutgers/NEEP
1:10pm	15 minutes	Report out from the NJ ECC Subcommittees	NEEP/Rutgers
1:25pm	20 minutes	Defining Metrics for Building Performance Standards	Rutgers
1:45pm	10 minutes	Break	
1:55pm	20 minutes	Grid Modernization Initiatives in New Jersey	BPU
2:15pm	30 minutes	IECC Voluntary Appendices and Cost	NEEP/BPU
2:45pm		Networking	
4:00pm		NEEP's HEW2025 Welcome Reception	

Meeting Guidelines – Antitrust Statement

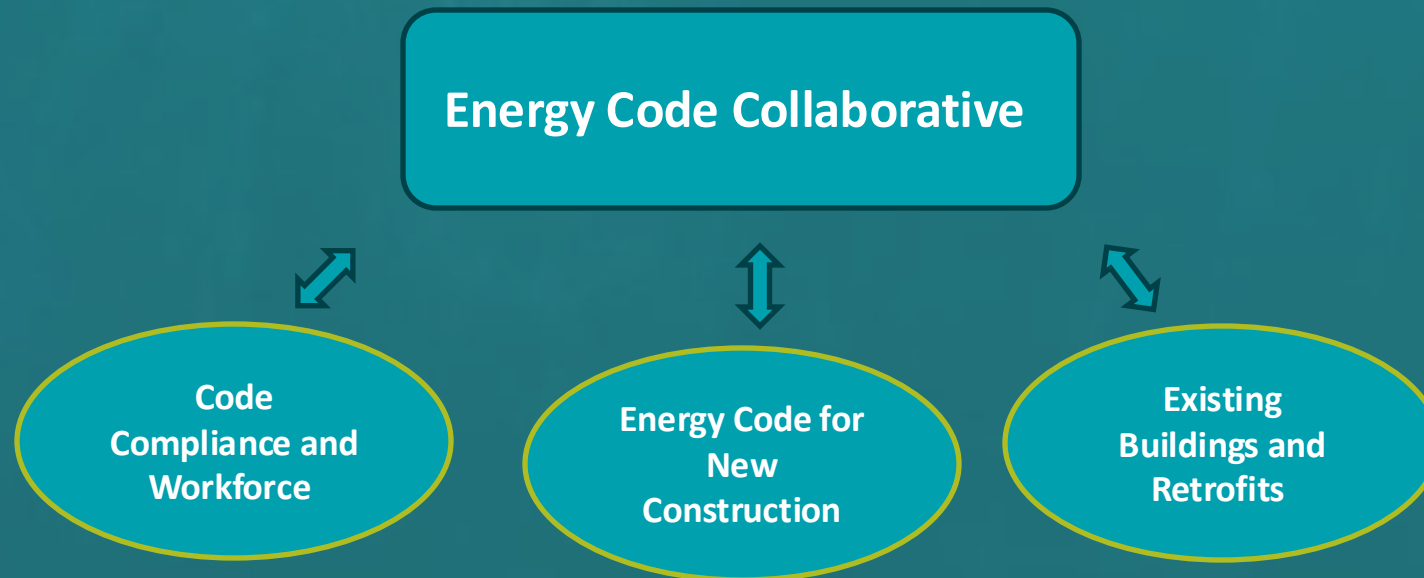


- Throughout our meetings, participants shall comply with competition law requirements and shall not enter into any discussion, activity or conduct that may violate any applicable competition law. Should the meeting discuss matters that contravene competition law requirements, it is the responsibility of participants to notify the Moderator who will discontinue the discussion or close the meeting.

NJ ECC Purpose



Establish a timely and robust, stakeholder-guided process to research and develop a New Jersey Zero Energy Building Roadmap that provides options to build government and market capacities to effectively advance an increasingly more energy-efficient building energy code and improve administration, enforcement and compliance, aligned with relevant clean energy policies of the State, including the Energy Master Plan goals and recommendations.



New Jersey Energy Master Plan (EMP and other relevant statutes)



- **2019:** Governor Phil Murphy issued **Executive Order (E.O.) 28**, updating New Jersey's **Energy Master Plan (EMP)** and directing the Board of Public Utilities (BPU) to develop a statewide clean energy strategy.
- **2020:** The **Global Warming Response Act (GWRA) 80x50 Report** identified pathways to cut greenhouse gas emissions **80% below 2006 levels by 2050**.
- **2023 Executive Orders:**
 - **E.O. 315**: Accelerated the clean energy* goal to **100% by 2035** through efficiency and renewables.
 - **E.O. 316**: Advanced **building electrification** for commercial and residential sectors.
 - **E.O. 317**: Planning for the **natural gas transition**.
- **2024 New Jersey Energy Master Plan:** Development in process
 - **Executive Summary draft** published in March 2025

* The EMP defines 100% clean energy to mean 100% carbon-neutral electricity generation and maximum electrification of the transportation and building sectors to meet or exceed the GWRA emissions reductions.

Zero Energy Building Roadmap



The Roadmap, as a living document, presents three concurrent pathways with explicit actions and timing for implementing zero energy building strategies, primarily through the adoption/amendment of building codes. These pathways, adopted together, are designed to lead New Jersey to implement zero-energy building codes for both new construction and existing buildings by 2030 or sooner.

- New Building Base Code Path
- Stretch Code/Zero Energy Code Path
- Existing Building Path



Code Compliance & Workforce Subcommittee Report Out



What We Reviewed



Completed reports:

- [NEEP's Code Enforcement Workforce Gap Analysis](#)
- [NJ Energy Code Compliance Baseline](#)
- [NJ's Energy-efficiency Workforce Needs, Infrastructure, and Equity Assessment](#)

Active Initiatives:

- [Building and Industry Leadership Team \(BILT\)](#)
- [Energy Code Official – Training and Education Collaborative \(ECO-TEC\)](#)

Activity	Date
1. Course module outlines sent to partners	October 6
2. Feedback on course module outlines due from partners	October 17
3. First draft of course modules sent to partners	November 10
4. Feedback on first draft of course modules due from partners	November 21
5. Second draft of course modules sent to partners	December 8
6. Feedback on second draft of course modules due from partners	December 12

What We Heard: Opportunities



- **Staffing and Recruitment Growth**

- Current general staffing shortages in code enforcement with significant retirements anticipated will strain enforcement
- Youth are unaware of career opportunities as code officials
- Salaries and benefits in the field are not competitive with other career options

- **Training and professional development**

- Code complexity requires enhanced training programs, but current training opportunities are limited, and there is lack of awareness around career options and training programs.
- Need for clearly defined baseline energy knowledge requirements for those seeking careers in code enforcement
- Energy code training is not mandatory for code officials, which would likely require legislative change
- Third-party enforcement models (similar to those in DC or NYC) may help alleviate shortages while maintaining quality and improving enforcement.

What We Heard: Action Steps



Develop Streamlined Path for Professionals

- Objective: Create/streamline entry pathways for related professionals (e.g., licensed engineers, architects, energy raters)
- Action: Review existing offerings and gaps/needs to develop streamlined pathways

Enhance Recruitment and Compensation

- Objective: Improve career attractiveness/awareness/preparedness
- Actions: Review current recruitment programs through high schools, trade schools, unions, and community colleges to assess awareness and interest in career opportunities. Explore avenues to influence compensation packages

What We Heard: Action Steps



Expand Training Programs and Resources to Better Leverage Technology

- Objective: Enhance energy code enforcement capabilities/consistency
- Actions: Identify and engage stakeholders to determine needs and potential tools

Strengthen Energy Code Understanding

- Objective: Reinforce the importance and mandates of energy efficiency for code officials
- Action: Assess current code official understanding of importance of energy codes

Explore Legislative and Enforcement Options

- Objective: Explore options for mandatory energy code training legislation
- Actions: Research legislative requirements and other opportunities



Energy Code for New Construction Subcommittee Report Out



What We Reviewed



Base codes

The minimum energy efficiency levels set in the state-adopted version of a national model code, which may have state specific amendments.

Stretch codes

A stretch code is an adoptable and enforceable code that exceeds the requirements of the base code. Stretch codes typically enhance building energy efficiency and may also contain additional considerations like building material impacts, water efficiency, renewable energy, and resilience or grid security. Stretch codes may be required for specific building types, building sizes, certain funding or incentive programs, or be voluntary.*

Green Stretch Codes include provisions or requirements that may address Indoor Air Quality (IAQ), site, building material life cycle, and water use and reuse.

Energy Stretch Codes require additional efficiency beyond the base code.

Electric/Electric Ready Stretch Codes require that a building be all electric or have electric ready connections for at least all major end uses regulated by the energy code.

Zero Energy Stretch Codes contain provisions that lead to the design and construction of buildings that are zero energy; such buildings produce or procure renewable generated power to offset their energy consumption annually. Some Zero stretch codes require that the building be 100 percent electric and utilize no fossil fuels or emit any greenhouse emissions.

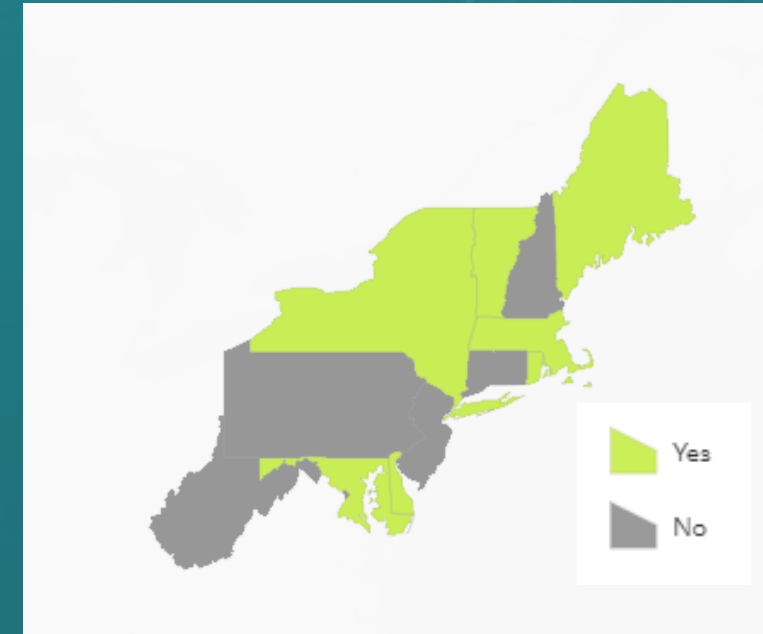
*Unites States Department of Energy, Building Energy Codes Program, Stretch Codes

Stretch Codes

Regional Building Energy Codes



Stretch Codes in New England and the Mid-Atlantic			
State	Residential	Commercial	Notes
MA	Base Code Overlays	Base Code Overlays	Stretch Code and Specialized Opt-In
ME	Percent Better than Base Code	Percent Better than Base Code	Percent better than 2021 IECC base code based on presence of mixed fuels or all-electric
NY	Base Overlay or Written by Jurisdiction	Base Code Overlay or Written by Jurisdiction	Current NYStretch 2020, anticipated NYStretch Energy Code Update 2026 - jurisdictions can develop their own stretch code
VT	Point-Based System	None	Points for: EV Charging, Solar Ready, Air Leakage, Building Envelope, Heating and Cooling, Water Use
RI	Department of Energy Zero Energy Ready Home Requirements	2015 International Green Construction Code (IgCC)	The IgCC is a different model code than the commonly-used IECC and ASHRAE base codes. It focuses on creating green and sustainable buildings.
MD	None	IgCC as applied by jurisdiction	2021 IgCC also applies to buildings owned/funded by MD
DE	Written by jurisdiction	Written by jurisdiction	DE SB 289 2023-2024



What We Reviewed



Stretch codes may be incentive-based (MA, NY) to help states reach climate goals

- **MA**: *Green Communities eligible for \$125K base grants; MassSave incentives for high-performance new construction to builders*
- **NY**: *Clean Energy Communities receive grant funds; Building Better Homes program supports construction of net zero emission homes to builders; NYSERDA Energy Star Labeled Homes to builders*

NJ, including through the Clean Energy program and the NJEDA, already has incentives for high performance buildings, including measures that are consistent with some of the examples found in stretch codes. There is an opportunity to align these incentives with stretch codes.

What We Heard: Opportunities



- **Code Alignment and Performance**

- Could current incentives be reorganized as a basis for a stretch code?
- Ideally, stretch codes would align with State Energy/GHG master plan goals
- Potential lack of uniformity and predictability in net zero/stretch code adoption by local municipalities is a concern
- Compile list of above-code incentives and programs, assess alignment with available codes
- Adopting a stretch and/or net zero energy code may require legislative action

- **Policy and Infrastructure**

- Policy and grid limitations may impede affordable and realistic net zero energy buildings
- Grid capacity concerns for building decarbonization and EV charging infrastructure
- Schedule presentation on grid capacity concerns, possibly at Heating Electrification Workshop in October

What We Heard: Action Steps



Explore Stretch Code (Working Group)

- Objective: Establish clear performance standards that align with state goals
- Actions: Explore stretch code approach and how it could contribute to meeting the goals of the State Energy/GHG master plans
- Solutions/Next Steps: Determine viable stretch code approach

Explore Net Zero Energy Code Adoption (Working Group)

- Objective: Develop proposals for possible NZE code implementation
- Actions: Explore various NZE code adoption options (eg NZE readiness, NZE stretch code, NZE base code) and their relationship to meeting State Energy/GHG master plan goals.
- Solutions/Next Steps: Develop specific implementation proposals, review adoption mechanisms and legislative opportunities



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Existing Buildings and Retrofits Subcommittee Report Out



What We Heard: Opportunities



- **Incentive Program Coordination**

- Improve incentive consistency and alignment with State agencies.
- Clarify distinction between when to use new construction or existing building incentives
- Streamline programs that are overly complex
- Expand incentives in critical sectors like multifamily that may be limited currently

- **Regulatory Alignment**

- Review Rehab code energy efficiency requirements to identify opportunities for improvement
- Align existing building incentives with the Rehab code project type definitions better

What We Reviewed



NJ Rehab Subcode

- Specific energy efficiency references within the subcode – section 6.8
- Where NJ Rehab does and does not trigger energy efficiency upgrades and the extent

Active Initiatives:

- Incentive matrix development
- Incentive decision tree development
- Rehab Subcode energy requirements & alignment to incentives to identify opportunities for amendments/improvement
- Multi-family incentive gaps and opportunities

What We Heard: Action Steps



- **Develop Comprehensive Incentive Matrix**
 - Objective: Map all utility incentive programs to identify gaps and overlaps
 - Action: Create a unified matrix showing incentive offerings across entities
- **NJDEP Released 'One-Stop' Tool 10/14/25**
 - Input and review provided by Rutgers/NEEP/NJBPU in development
 - https://njonestopshop.org/?utm_medium=email&utm_source=govdelivery



What We Heard: Action Steps



- **Rutgers Developed Comprehensive Listing of Incentives Across All Agencies**
 - Utilities, NJBPU, NJHMFA, NJEDA, Federal
 - Sortable database by new or existing and residential or commercial project types
 - Similar to 'One-Stop' but in excel format as one complete file

New Jersey Incentive Matrix



Res/Comm	New/Existing	Program	Incentive Type	Title	Dates / Notes	Link	Program Summary	Min Energy Performance Goals
R/C	N/E	NJ CEP	IN	SuSI-ADI Successor Solar Incentive Program - Administratively Determined Incentive	Last Updated 12/15/23	https://njadi.customersupport.com/	Summary: SuSI Program provides incentives to eligible solar facilities	not found
		NJ HFMA		New Jersey Housing and Mortgage Finance Agency		https://www.nj.gov/dca/hmfal/		
R/C	N	NJ HMFA	Tax Credit	NJ HMFA Green Points housing tax credit program		https://www.nj.gov/dca/hmfal/greenpoints/	Summary: Green Points NJ HMFA Low Income Housing Tax Credit	N/A tax credit
R/C	E	NJ Treasury	Tax credit	Property Tax Exemption for Renewable Energy Systems	3/14/2025 no changes to incentives	https://programs.dsir.state.nj.us/	Summary: NJ exempting renewable energy systems used to meet energy needs	N/A tax credit
R/C	N/E	NJ Treasury	Tax credit	Solar Energy Sales Tax Exemption	no changes as of 1/6/2025	https://programs.dsir.state.nj.us/	Summary: New Jersey offers a full 100% exemption from the state sales tax on solar energy equipment	N/A tax credit
		NJEDA		New Jersey Economic Development Authority		https://www.njeda.gov/activeprograms/		
C	E	NJEDA	IN	NJ COOL Program (PILOT)	Rolling Application	https://www.njeda.gov/cool/	Summary: NJ Cool program is a \$15 million pilot program launched in 2017	Project scope must include: A. Switching (75% or more) of building
C	E	NJEDA	Tax credit	Urban Enterprise Zone (UEZ) Manufacturers Energy Sales Tax Exemption	none noted	https://www.njeda.gov/uez/	Summary: exemption from the sales and use tax for electricity at manufacturing facilities	N/A tax credit
C	N/E	NJEDA	Loan	NJ CELs New Jersey Clean Energy Loans	open for application 5.22.25	https://www.njeda.gov/celes/	Summary: NJ CELs is an \$80 million co-lending program launched in 2017	N/A Loan
C	N/E	NJEDA	Tax Credit	Salem County Energy Sales Tax Exemption	none noted	https://www.njeda.gov/salem/	Summary: provides an energy sales tax exemption for the retail sale of energy	N/A tax credit
R/C	E	NJEDA	Loan	C-PACE: Garden State Commercial Property Assessed Clean Energy Program	last updated 12/21/23	https://www.njeda.gov/cpace/	Summary: The Garden State Commercial Property Assessed Clean Energy Program	N/A financing
R/C	E	NJEDA	Z	Edison Innovation Clean Energy Manufacturing Fund - Grants and Loans	not accepting applications	https://www.njeda.gov/edison/	Loan program	N/A not accepting applications
		NJNG		New Jersey Natural Gas		https://www.njng.com/	https://www.savegreen.com/businesses/index.aspx	
C	E	NJNG	IN	NJNG SAVEGREEN - Direct Install	subject to available funding	https://www.savegreen.com/	Summary: Improve your small to mid-sized business's energy efficiency	none noted - contact form for application
C	E	NJNG	IN	NJNG SAVEGREEN - Energy Management	subject to available funding	https://www.savegreen.com/	Summary: Energy Management: Comprehensive approach: O&M	none noted - contact form for application
C	E	NJNG	IN	NJNG SAVEGREEN - Engineered Solutions	subject to available funding	https://www.savegreen.com/	Summary: Engineered Solutions; comprehensive measures and rebates	none noted - contact form for application
C	E	NJNG	IN	NJNG SAVEGREEN - Prescriptive & Custom	subject to available funding	https://www.savegreen.com/	Summary: high-efficiency equipment upgrades, tune-ups, or retrofits	none noted - contact form for application
R	E	NJNG	IN	NJNG SAVEGREEN - Residential - HVAC and Water Heating	subject to available funding	https://www.savegreen.com/	Summary: HVAC and Water Heating replacement rebates with financing	None noted - rebate program
R	E	NJNG	IN	NJNG SAVEGREEN - Residential - Hybrid Heat	subject to available funding, equipment must be installed by 2027	https://www.savegreen.com/	Summary: Residential - Hybrid Heat upgrades, maximizing efficiency	none noted
R	E	NJNG	IN	NJNG SAVEGREEN - Residential - Income-qualified Programs - Home Weatherization	installed by 2027	https://www.savegreen.com/	Summary: a free* energy assessment of your home; - Insulation, weatherstripping	none noted
R	E	NJNG	IN	NJNG SAVEGREEN - Residential - Whole Home Energy Assessments	subject to available funding Available for residential customers	https://www.savegreen.com/	Summary: SAVEGREEN Whole Home Energy Assessment - home energy audit	Save up to 20% on energy bills' Energy Star, weatherization and other
R	E	NJNG	IN	NJNG SAVEGREEN - Residential - Whole Home Energy Solutions	subject to available funding	https://www.savegreen.com/	Summary: SAVEGREEN Rebates and financing for Home upgrades	Save up to 20% on home energy costs'
R	N/E	NJNG	IN	NJNG SAVEGREEN - Residential - NJNG Marketplace		https://www.poweredbynj.com/	Summary: Online marketplace through NJ NG with discounts on energy efficient products	Products discounted are ENERGY STAR, LED, 'Smart', WaterSense
R	N/E	NJNG	IN	NJNG SAVEGREEN - Residential - Online Energy Audit	subject to available funding	https://njng.energy.com/	Summary: Online home energy analysis by survey, report and recommendations	None noted
		PSE&G		PSE&G		https://nj.pseg.com/saveenergymoney/energysavingpage/energyefficiency?utm_campaign=pseg-portfolio-wide-portfolio-wide&utm_source=vanity&utm_medium=referral		
C	E	PSE&G	IN	PSE&G -Direct Install Government and Non-profit Facility	Last updated 8/11/23	https://bizsave.pseg.com/	Summary: free, on-site energy assessment, recommend energy efficiency measures	Goal to lower utility bills by up to 30%
C	E	PSE&G	IN	PSE&G: Business Energy Assessment Tool: Automotive, Healthcare, Hospitality, Education	none noted	https://bizsave.pseg.com/	Summary: 3 Tiers of energy efficiency measures from simple up to advanced	None noted - online tool
R	E	PSE&G	IN	PSE&G: Appliance Recycling Event(s)	4/1/25 - 6/30/25	https://homeenergy.pseg.com/	Summary: Recycling events for old appliances Sectors: Residential, Commercial	None noted
R	E	PSE&G	IN	PSE&G: Home Energy Assessment tool	none noted	https://homeenergy.pseg.com/	Summary: free energy assessment, no-cost products and upgrades	Online tool. None noted
R	N/E	PSE&G	IN	PSE&G: HVAC Instant Rebates Program	none noted	https://homeenergy.pseg.com/	Summary: Upgrade to Energy Star certified HVAC equipment (100% rebate)	HVAC upgrade to EnergyStar
R	N/E	PSE&G	IN	PSE&G: Rebates and Discounts on Energy Efficient Appliances	none noted	https://homeenergy.pseg.com/	Summary: Rebates and Discounts for ENERGY STAR appliances	Products discounted are ENERGY STAR, LED, 'Smart', WaterSense
		SJG		South Jersey Gas		https://www.southjerseygas.com/save-energy-money/energy-efficiency-programs		
C	E	SJG	IN	Commercial and Small Business: Direct Install Program		https://sjgcisavings.com/	Summary: Direct Install - Energy Assessment and Upgrades: HVAC, Water Heating	None noted
C	E	SJG	IN	Commercial and Small Business: Energy Management Program		https://sjgcisavings.com/	Summary: guided consultative service to assist customers in identifying energy efficiency opportunities	None noted
C	E	SJG	IN	Commercial and Small Business: Engineered Solutions Program		https://sjgcisavings.com/	Summary: Engineered Solutions - Provides guided consultative service to assist customers in identifying energy efficiency opportunities	None noted

Defining Metrics for Building Performance Standards

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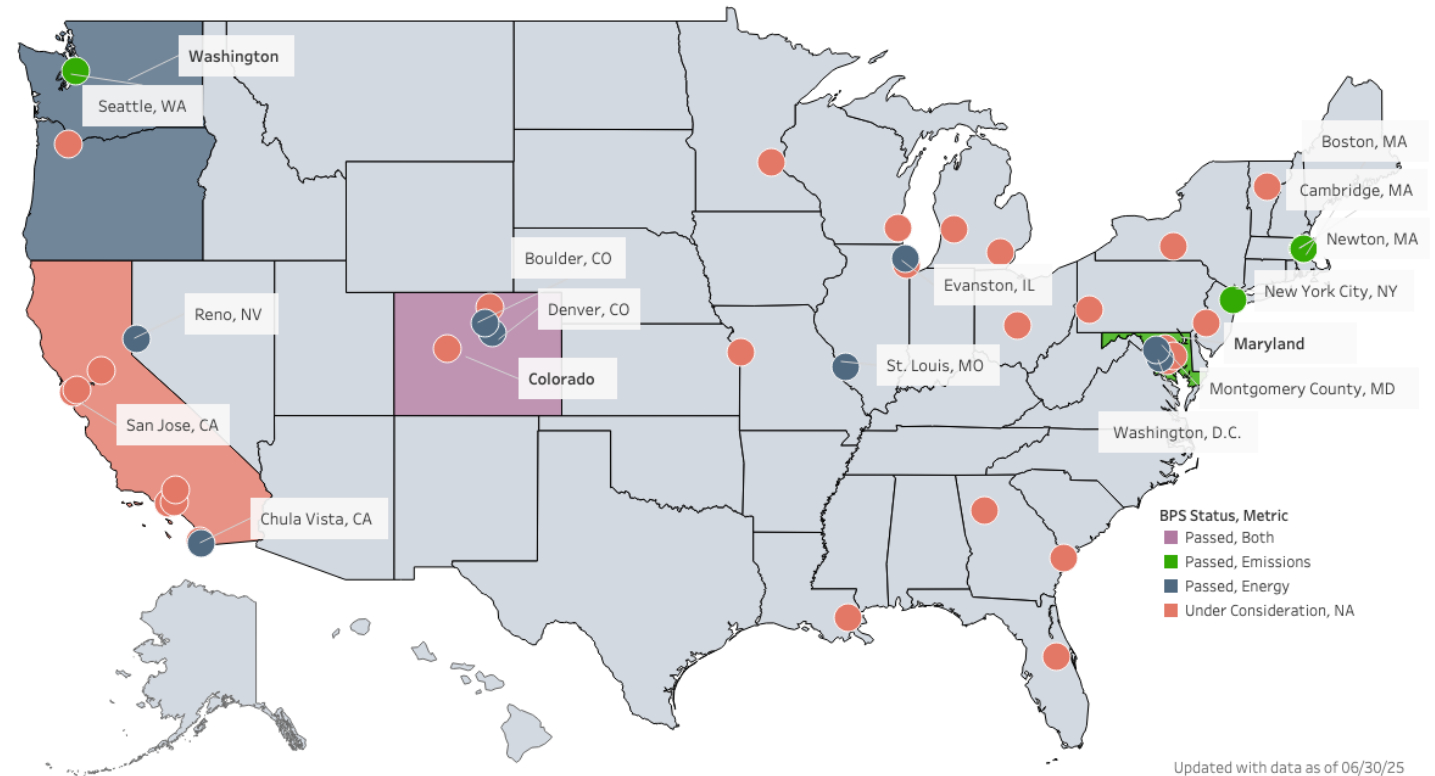
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- Building performance standards (BPS) aim to reduce energy use and emissions in existing buildings.
- BPS benefits also include reduced costs, improved occupant comfort, building durability, and grid resilience.
- BPSs have growing policy momentum across the United States.

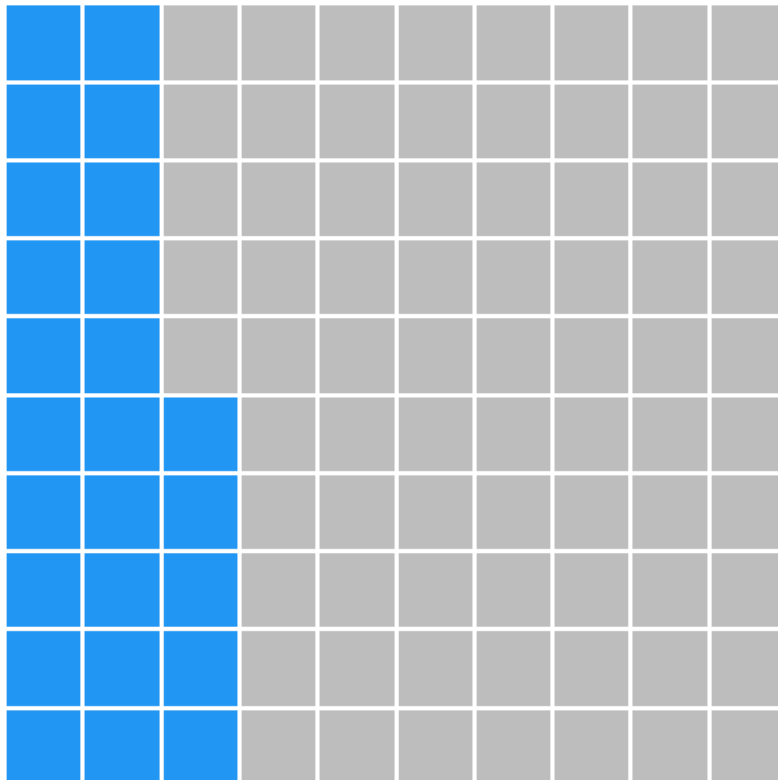
State and Local Building Performance Standards



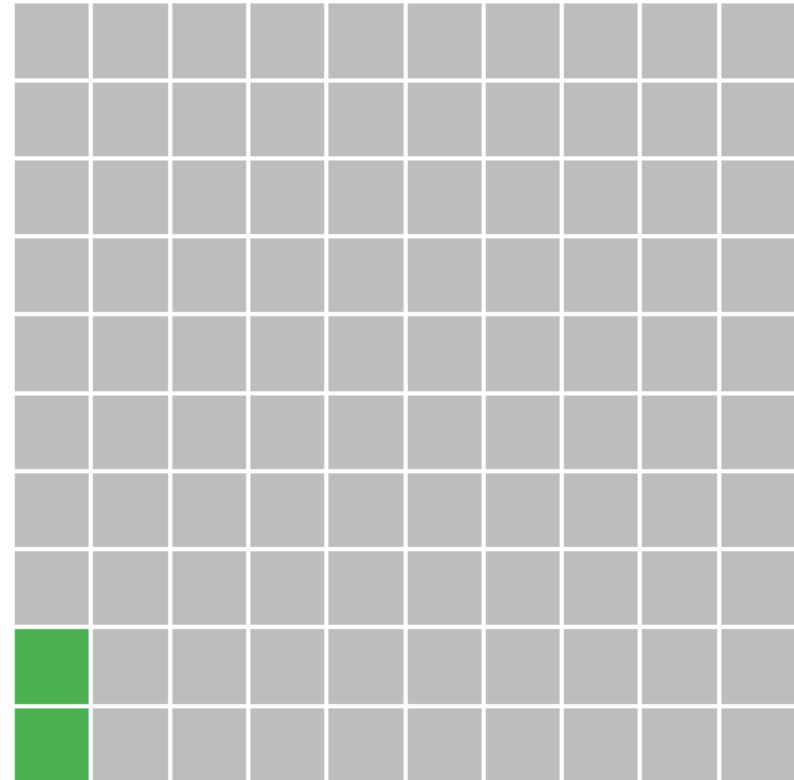
Source: Department of Energy

Addressing the energy use of New Jersey's existing building stock in a cost-effective and resilient manner is important for the State's to reach its climate goals.

25% of emissions in NJ
are from commercial and residential buildings



2% of buildings are replaced a year
with new construction in New Jersey



NJ Benchmarking Program (established through P.L. 2018, c.17 (C.48:3-87.8 et al.))

- Building Energy and Water Use Benchmarking Order
- ~10,000 buildings over 25,000 square feet are subject to this ordinance
- Buildings are required to report various energy and water end-uses
- Buildings are not required to meet any energy and water end-use thresholds

When considering a BPS, national best practices have led us to consider five simple questions.

What Metrics?

What Buildings?

What Timing?

What Exceptions and Flexibility?

What Consequences?

Allows us to measure savings

Metric



Selecting an appropriate metric is critical as guides long-term building investment decisions.

- A metric needs to:
 - Support NJ policy goals
 - Be simple
 - Send a market signal
 - Focus on actions that a building owner may control
 - Be widely accessible
 - Ensure energy reduction
 - Discourage lock-in of inefficient systems
 - Promote the widespread share of energy savings
- A metric should:
 - Align with best national practices
 - Align with surrounding jurisdictions

Narrowing the BPS Metrics Options

Energy efficiency metrics

- Site energy use intensity (EUI)
- Source EUI
- ENERGY STAR score

Electrification metrics

- Percent of energy use that is from electricity
- Onsite greenhouse gas emissions

Renewable electricity metrics

- Onsite green power
- Total green power (on or offsite)

Greenhouse gas emissions metrics

- Total greenhouse gas emissions
- Onsite greenhouse gas emissions
- Time of use emissions

Grid balancing-related metrics

- Peak demand
- Coincident peak demand

What BPS metrics can address **energy efficiency** in buildings?

Site EUI: Energy use per square foot per year (what is on the utility bill).

Source EUI: Site EUI + the losses from generation, transmission, and delivery.

Energy Star Score: 1 to 100 rating that indicates a building's energy efficiency relative to similar buildings nationwide.

BPS metrics that can address **energy efficiency** in buildings

	Site EUI	Source EUI	Energy Star Score
Simple	✓	✓	✓
Within building owner's control	✓	?	?
Favors electrification	?	✓	✓
In portfolio manager	✓	✓	✓
Available for all buildings	✓	✓	X
Normalization approach exists	?	?	✓
Data verification needed	Building size, meter data	Building size, meter data	Building size, meter data, characteristics

What BPS metrics can address **greenhouse gas emissions (GHG)** in buildings?

On-Site GHG Emissions Intensity: Emission intensity from fuels burned directly at the building.

Total GHG Emissions Intensity: Accounts for emissions from both on-site fuel use + electricity generation.

BPS metrics that can address **GHG** emissions in buildings

	On-site GHG Emissions Intensity	Total GHG Emissions Intensity
Simple	✓	✓
Within building owner's control	✓	X
Favors electrification	✓	?
In portfolio manager	✓	✓
Available for all buildings	✓	✓
Normalization approach exits	X	X
Data verification needed	Building size, meter data by end use	Building size, meter data by end use

What BPS metrics can address **demand** in buildings?

Peak Electric Demand: Highest electricity demand over a certain period.

Coincident Peak Electric Demand: Electricity demand when total system demand on the utility serving the property was at its highest.

BPS metrics that can address **demand** in buildings

	Peak Electric Demand	Coincident Peak Electric Demand
Simple	X	X
Within building owner's control	✓	X
Favors electrification	NA	NA
In portfolio manager	?	X
Available for all buildings	✓	?
Normalization approach exists	NA	NA
Data verification needed	Data for building demand (hourly? Sub-hourly?)	Data for building demand and grid demand

Discussion Questions

- Which BPS metrics best support NJ's climate and energy goals?
- Which BPS metrics most likely to drive energy savings and emissions reductions by 2030? By 2050?
- Which BPS metrics are most likely to prove cost-effective and provide building and grid resilience?
- Which BPS metrics are aligned with policies in surrounding states such that socialization of topics and portfolio management is consistent?



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Break
10 minutes





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Grid Modernization Initiatives in New Jersey





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Introduction to 2024 IECC Appendices



NJ Uniform Construction Code and IECC Appendices



- The current adopted version of the UCC notes that any 2021 IECC appendices can be used voluntarily
- We heard interest from some NJ ECC members about the inclusion of appendices in the next version of the UCC

Appendices Overview



- Commercial
 - 2021 IECC: 3 appendices
 - 2024 IECC: 10 appendices and 2 resources
- Residential
 - 2021 IECC: 3 appendices
 - 2024 IECC: 12 appendices and 1 resource

Commercial Overview



- CA – Board of Appeals*
- CB – Solar-Ready Zone – Commercial*
- CC – Zero Energy Commercial Building Provisions*
- CD – The 2030 Glide Path
- CE – Required HVAC Total System Performance Ratio (TSPR)
- CF – Energy Credits
- CG – Electric Vehicle Charging Infrastructure
- CH – Electric-Ready Commercial Building Provisions
- CI – Demand Responsive Controls
- CJ – Electrical Energy Storage System Index
- Resource Cra – All-Electrical Commercial Building Provisions
- Resource Crb – The 2030 Glide Path (Prescriptive)

*From 2021 IECC

Residential Overview



- RA – Board of Appeals*
- RB – Solar-Ready Provisions – Detached One- and Two-Family Dwellings and Townhouses*
- RC – Zero Net Energy Residential Building Provisions*
- RD – Electric Energy Storage Provisions
- RE – Electric Vehicle Charging Infrastructure
- RF – Alternative Building Thermal Envelope Insulation R-Value Options
- RG – 2024 IECC Stretch Code
- RH – Operational Carbon Rating and Energy Reporting
- RI – On-Site Renewable Energy
- RJ – Demand Responsive Controls
- RK – Electric-Ready Residential Building Provisions
- RL – Renewable Energy Infrastructure Index
- Resource Rra – All-Electric Residential Buildings

*From 2021 IECC

Solar Ready – Commercial & Residential

Appendices CB and RB



- Purpose – Prepare for the future installation of solar energy equipment, piping, and wiring
- Both CB and RB include language to establish solar-ready zones and outline how to deal with obstructions, interconnections, roof loads, and construction documentation
- Very similar to 2021 IECC versions

Zero Energy - Commercial

Appendix CC



- Purpose – Models how to apply new renewable energy generation when new buildings add electric load to the grid
- CC Description – Provides a framework for meeting minimum renewable energy requirements, including a table of prescriptive renewable energy requirements by building type and climate zone for onsite renewable generation and guidelines around procurement of off-site renewable energy.
- CC updates from 2021 IECC –
 - Changes from net zero carbon to net zero operational energy
 - Adds language about RECs
 - Changes adjusted off-site renewable energy calculation

Zero Net Energy - Residential

Appendix RC



- Purpose – Models how to apply new renewable energy generation when new buildings add electric load to the grid
- RC Description – Establishes criteria for compliance using Energy Rating Index (ERI) analysis
- RC updates from 2021 IECC –
 - Title change to be Zero Net Energy
 - Allows compliance using ASHRAE 90.2
 - Lower values for ERI to 42 when not including renewable energy (was 47 in both NJ climate zones) and 0 including adjusted onsite power production

Electric Vehicle Charging Infrastructure - Commercial

Appendix CG



- New Appendix in 2024 IECC
- Purpose – Provides a framework for electric vehicle charging infrastructure requirements
- CG Description – Requires parking facilities to provide electric vehicle power transfer infrastructure and provides specific details around EV capable spaces, EV ready spaces, Electric Vehicle Supply Equipment (EVSE) spaces, and system and circuit capacity.

Electric Vehicle Charging Infrastructure - Residential

Appendix RE



- New Appendix for 2024 IECC
- Purpose – Provides a framework for electric vehicle charging infrastructure requirements
- RE Description – Requires new residential buildings to have electric vehicle power transfer infrastructure and provides details on how to do so.
 - One EV ready, EV capable or EVSE space per one-family and two-family dwelling or townhome with on-site parking.
 - R-2 occupancies in mixed-use buildings must have an EV ready, EV capable, or EVSE space for 40% of parking spaces or dwelling units, whichever is less.

How are Other States in the Region Using Appendices?



- Delaware
 - CB – Solar-Ready Zone – Commercial
 - RE – Electric Vehicle Charging Infrastructure
 - Both amended to align with state statutes
- Massachusetts
 - Currently uses RB, CB, RC, CC with many state-specific alterations
 - RC and CC are used as templates for the stretch and specialized code
 - RC incorporates language that aligns with RI – On-Site Renewable Energy and RK – Electric-Ready Residential Building Provisions
 - Likely to continue this format with 2024 IECC adoption
- Rhode Island
 - CH – Electric-Ready Commercial Building Provisions
 - RK – Electric-Ready Residential Building Provisions
 - Both adopted in line with legislative mandates
- New York
 - RF – Alternative Building Thermal Envelope Insulation R-Value Options

DCA Timeline on 2024 Code Adoption



- 2024 I-codes likely to be adopted in mid-2026
- Next Steps: Publish the proposed code language in the New Jersey Register, followed by a 60-day public comment period
 - [Link to Register](#)
- The appendices are not currently included as mandatory requirements in the draft UCC language.



Thank you!

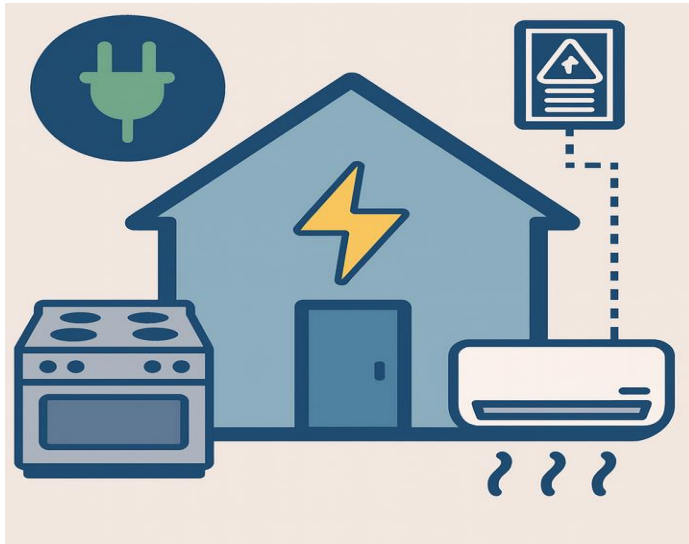




IECC 2024 Voluntary Appendices RE and RK Avoided Cost – New Construction vs Retrofit

Update – Oct 20, 2025

Rutgers Center for Urban Policy Research (CUPR)



Introduction

Appendix RK: Mandates dedicated circuits, outlets, and panel capacity for key appliances (stove, dryer, water heater) to enable future transition from gas to electric systems.

Appendix RE: Defines standards for residential buildings to include EV-capable, EV-ready, or EVSE-installed parking spaces.



EV CAPABLE



EV READY



EV INSTALLED

Goalsetting- New Jersey

330k light-duty EVs; 400 DC fast chargers; 1,000 Level 2 chargers
 15% of multi-family buildings and 20% of hotels EV-ready;
 25% of state fleet electric ¹

2 million EVs; 100% state fleet electric ¹



30% of multi-family and 50% of hotels EV-ready
 400,000 additional dwelling units, 20,000
 additional commercial spaces electrified
 Additional 10% LMI electric ready ²
 65% HP sales ³

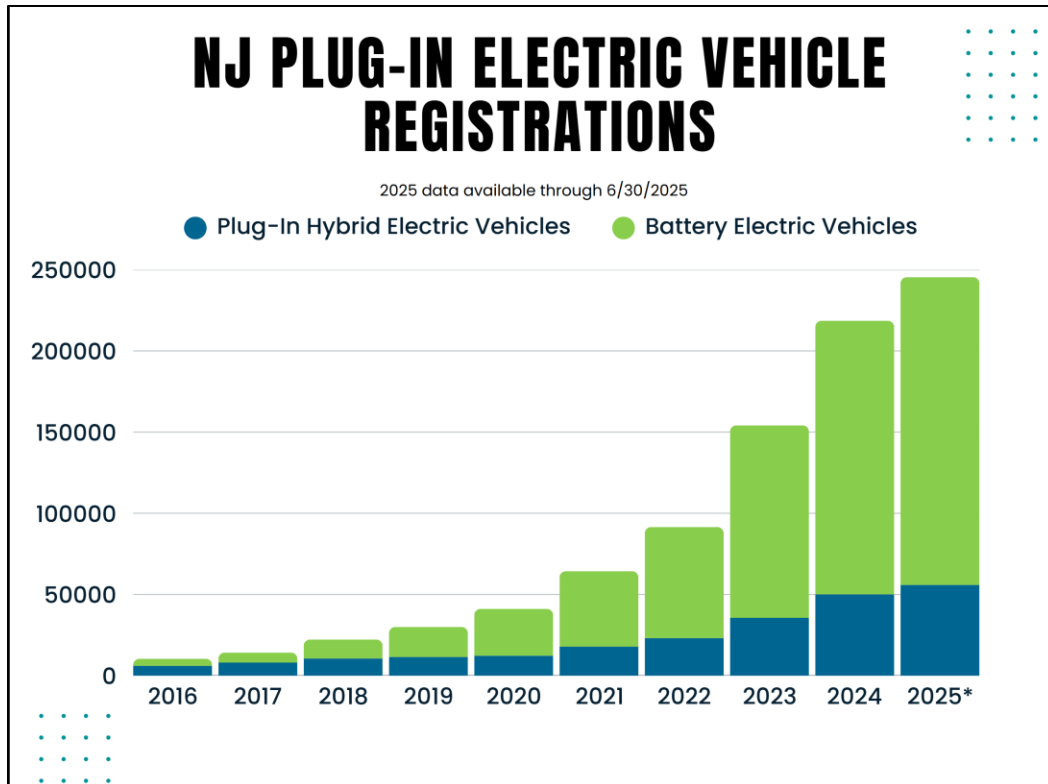
85% of new light-duty vehicle sales are electric
 Heat pumps make up 90% of residential heating, air
 conditioning, and water heating sales ^{1,3}

¹ [NJ EV Legislation P.L. 2019, c. 362](#)

² [Executive Order 316 \(2023\)](#)

³ [NESCAUM MOU \(2024\)](#)

EV Projection- New Jersey



Source: [Drive Green, NJDEP](#)



NJ Snapshot
80 EVs per level 2 port

Source: [EValueate.NJ](#)



By 2050, Projected EVs **4.45 million**
3.1 million charging ports required

2,648,402
Single Family Charging Ports

352,360
Shared Private Charging Ports

145,647
Public Level 2 Charging Ports

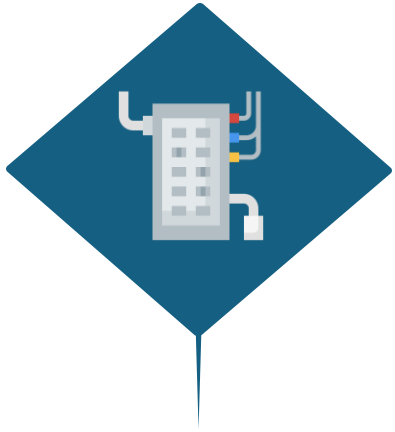
5,854
Public DC Fast Charging Ports

Source: DOE's EVI-Projection Model ([EVI-Pro Lite](#))

Charging Port Percentage
(Click to hide)

- Single Family: 84.0%
- Shared Private: 11.2%
- Public L2: 4.6%
- Public DC Fast: 0.2%

Electric & EV Ready-Key Components



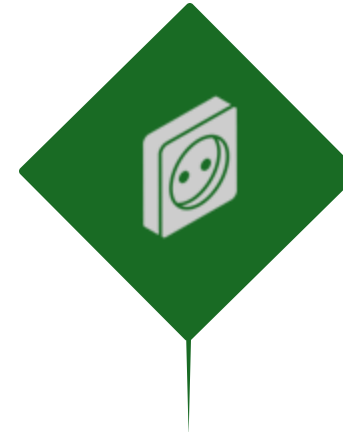
Panel or Switchboard

Adequate service capacity (often 200 amps¹)



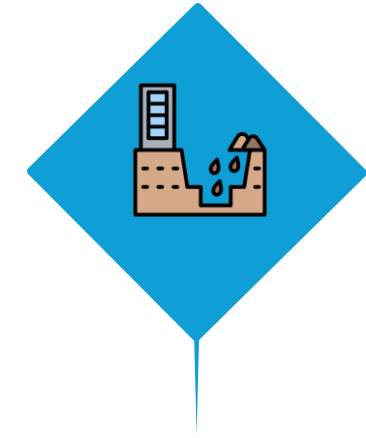
Conduit and Wiring

Continuous, pre-installed pathways
240-volt circuits pre-installed.



Receptacle

240-volt outlets or junction boxes.



Trenching

Protective trench to bury the conduit from a power source to the charging station.

¹ [Cost Study of the Building Decarbonization Code \(NBI 2022\)](#)

Why New Construction?



New Construction

Cost-effective¹
Optimized Electrical Layouts
Material Flexibility
Less Disruption



Retrofit

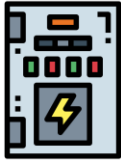
High Cost²
Additional Permitting and Demolition³
Service Disruptions

¹ [PNNL EV Charging Technical Brief \(2021\)](#)

² [PNNL Electric Readiness in Residential Energy \(2021\)](#)

³ [Electric Vehicle Infrastructure Cost Analysis, Energy Solutions \(2019\)](#)

Primary Cost Drivers



Electrical Panel Upgrade

48 million homes may require panel upgrades.¹

29% of U.S. homes have a main breaker of 100 amps or less, 59% less than 150 amps.²



Demolition

High labor cost for breaking through finished surfaces (concrete/asphalt), External wall/siding replacement.



Permits

While minimal for new construction, these fees contribute to higher costs (10x) in retrofit scenarios.³



Building Plans (Retrofit)

Higher fees for retrofits due to the need to investigate complex existing conditions.



Indirect & Management Costs

Additional cost, including mobilization, site visits, and project management overhead.

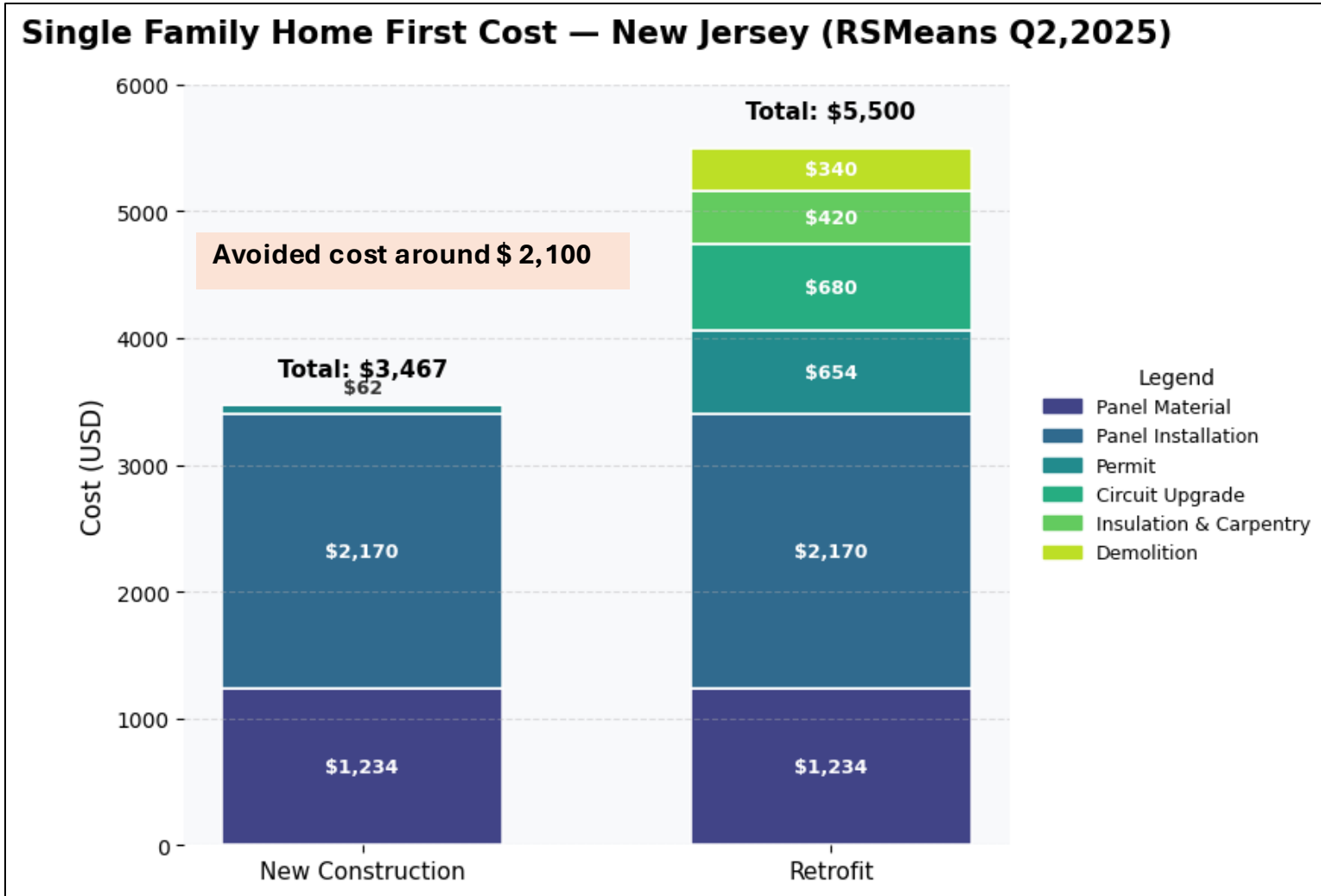
¹ [Addressing an Electrification Roadblock: Residential Electric Panel Capacity, Pecan Street Inc \(2021\)](#)

² [Defining the electrical panel barrier to residential electrification, ACEE \(2024\)](#)

³ [PNNL \(2016\)](#).

Electric Readiness

Single Family Home First Cost — New Jersey (RSMeans Q2,2025)

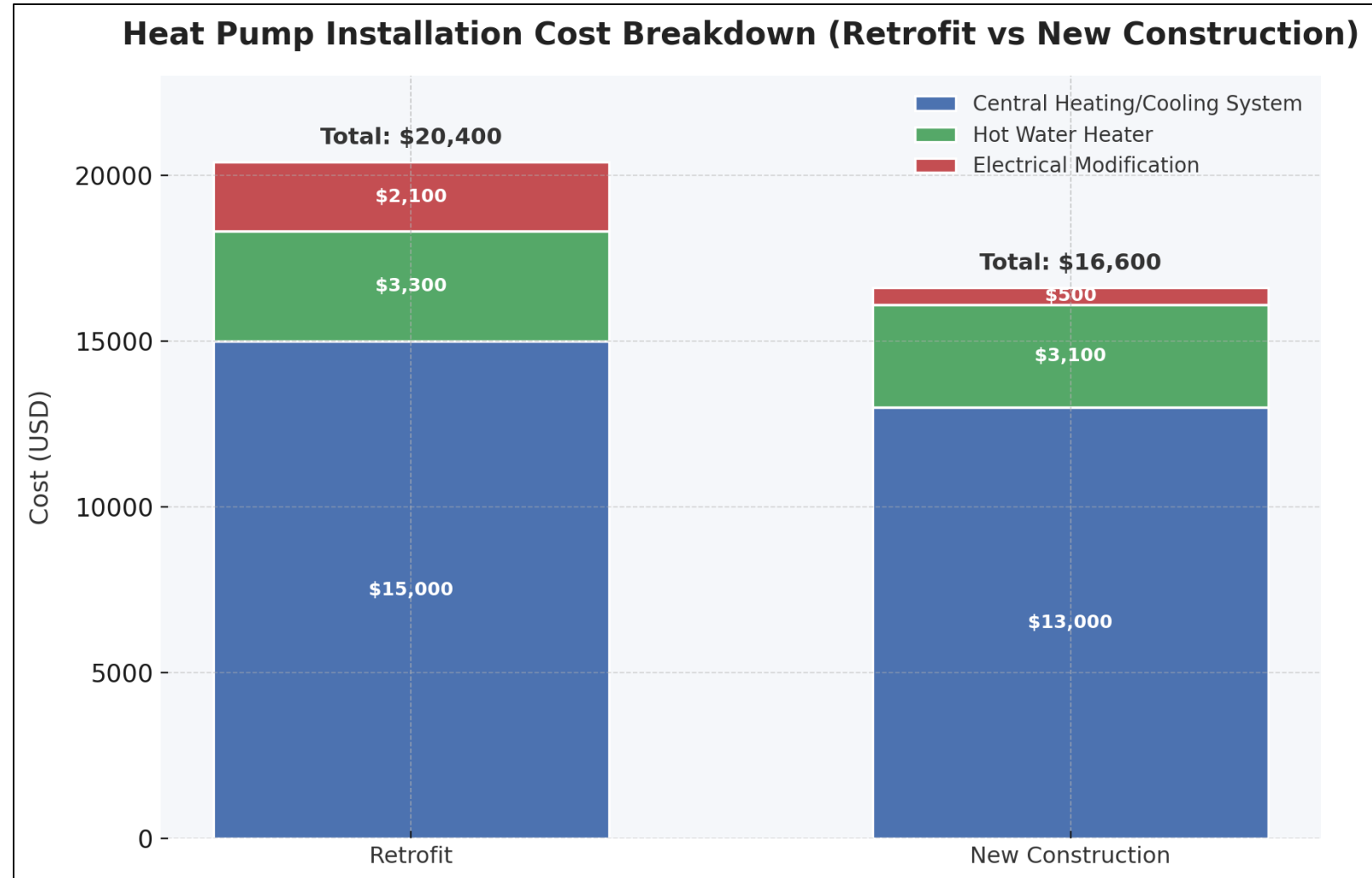


Assumptions:

- Cost of panel material and installation netted out.
- 20 feet of additional wiring for circuit upgrade.
- Insulation and carpentry based on a 2 ft width of panel.
- Demolition cost for 100-amp existing panel removal.
- Permit Cost from Energy Solutions (2016)

Single Family Home- CO Example

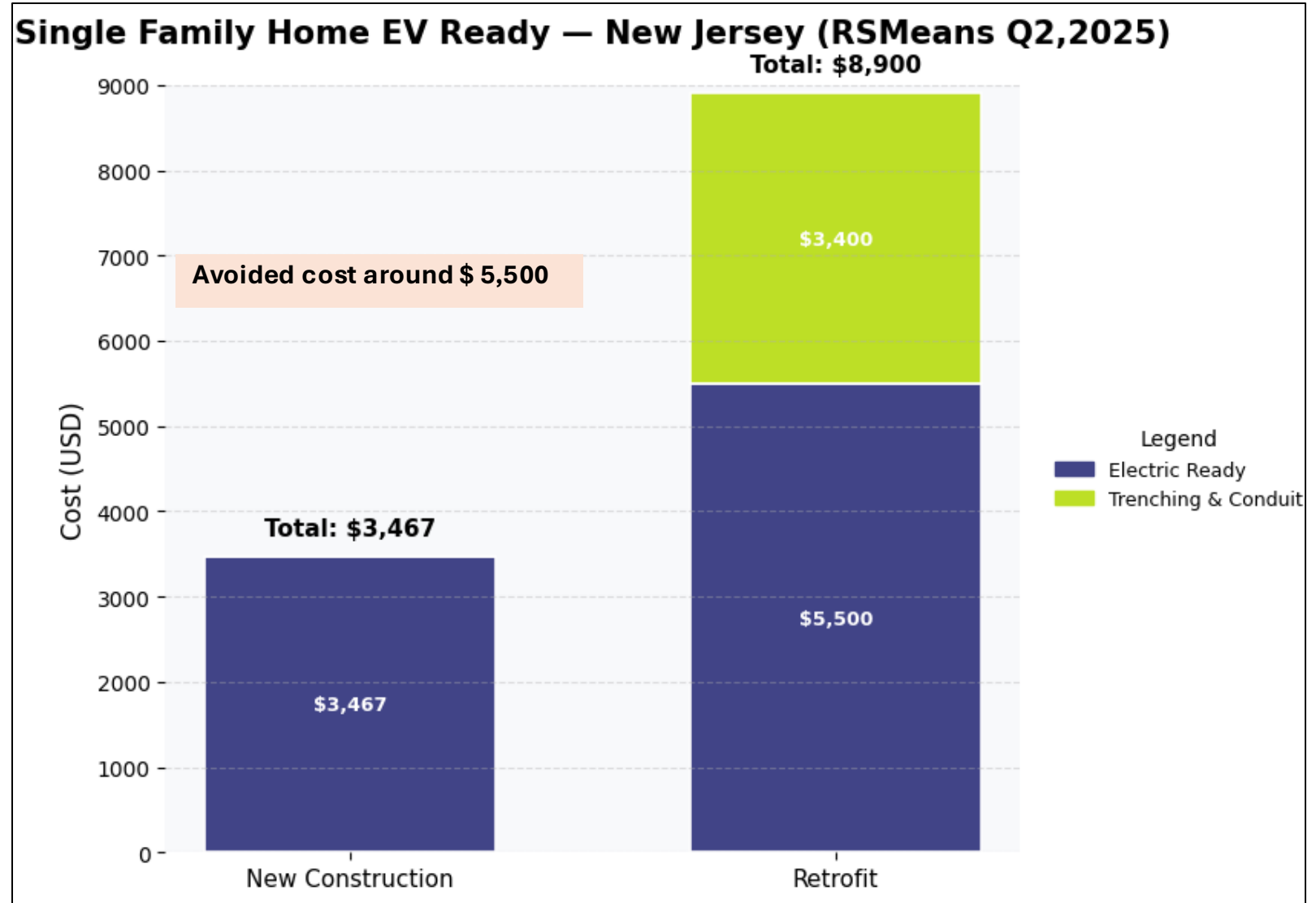
- Same equipment installation costs more in a retrofit compared to new construction.
- Avoided retrofit cost: **\$1,600** saved by just integrating electrical modifications during new construction.



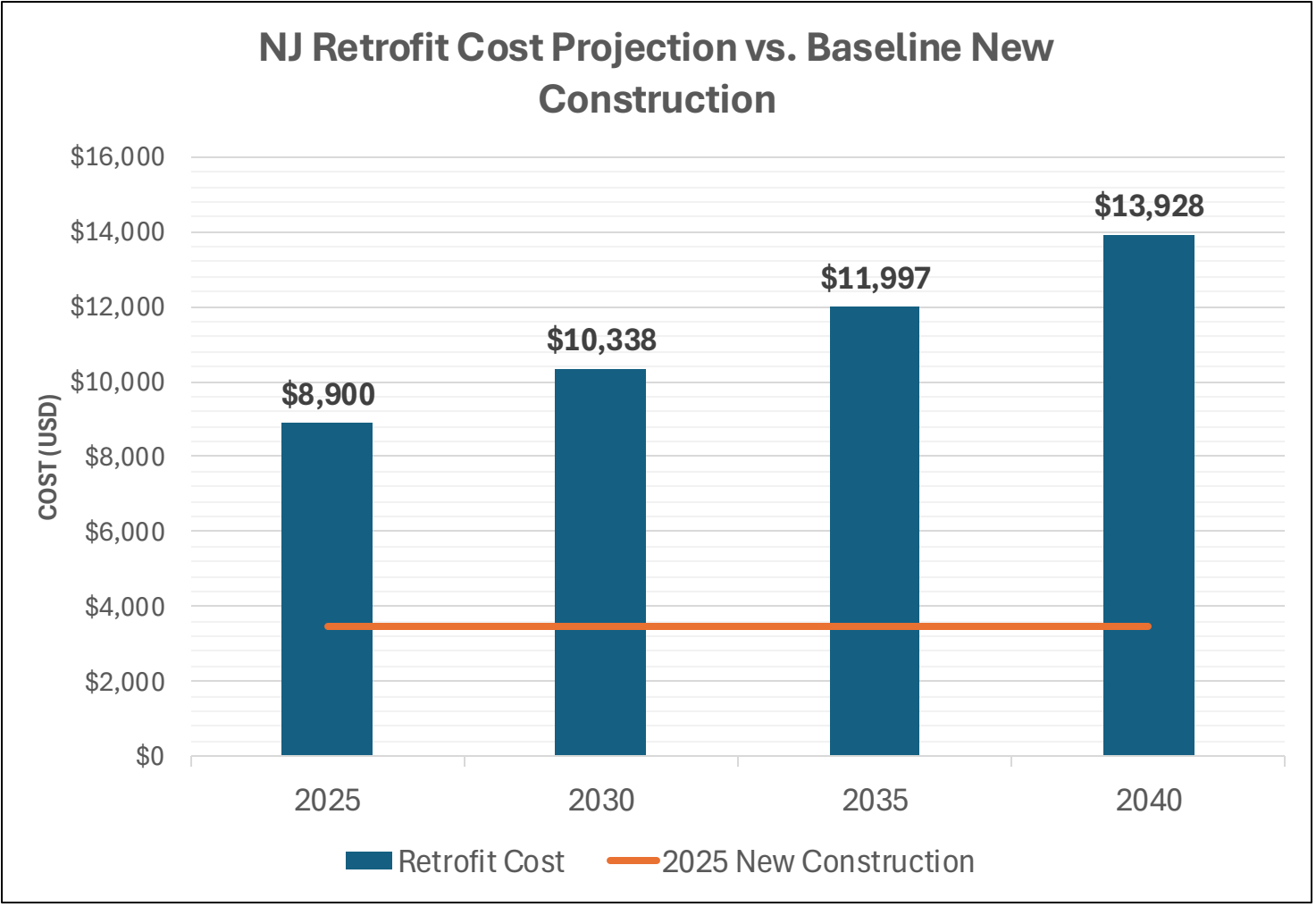
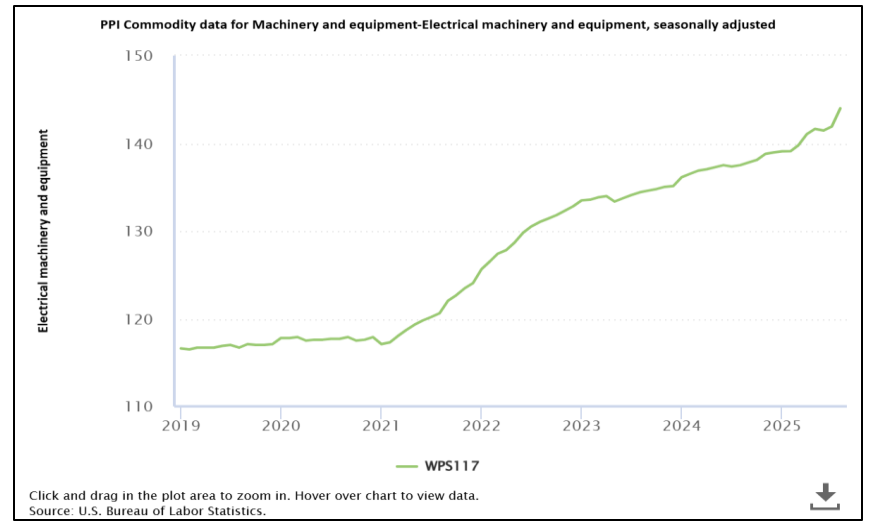
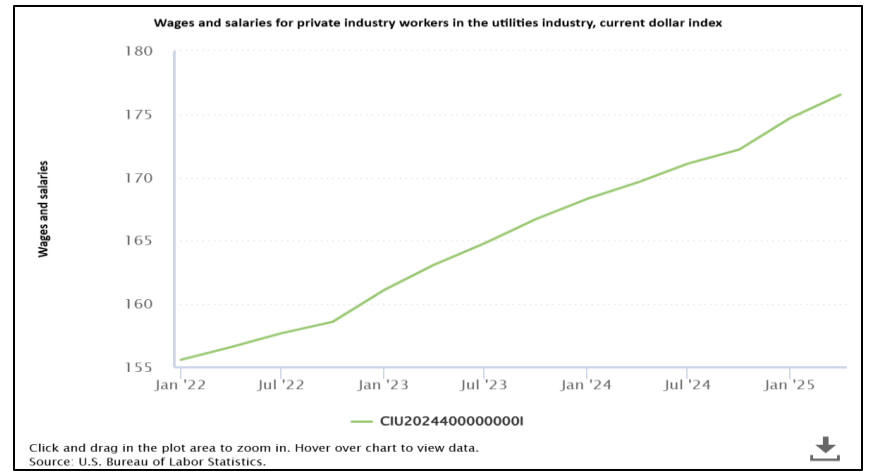
Source: [PNNL Technical brief 2024](#)

EV Readiness

- Additional 34 ft Trench and conduit work



Future EV Ready Retrofit Costs Per Space- New Jersey



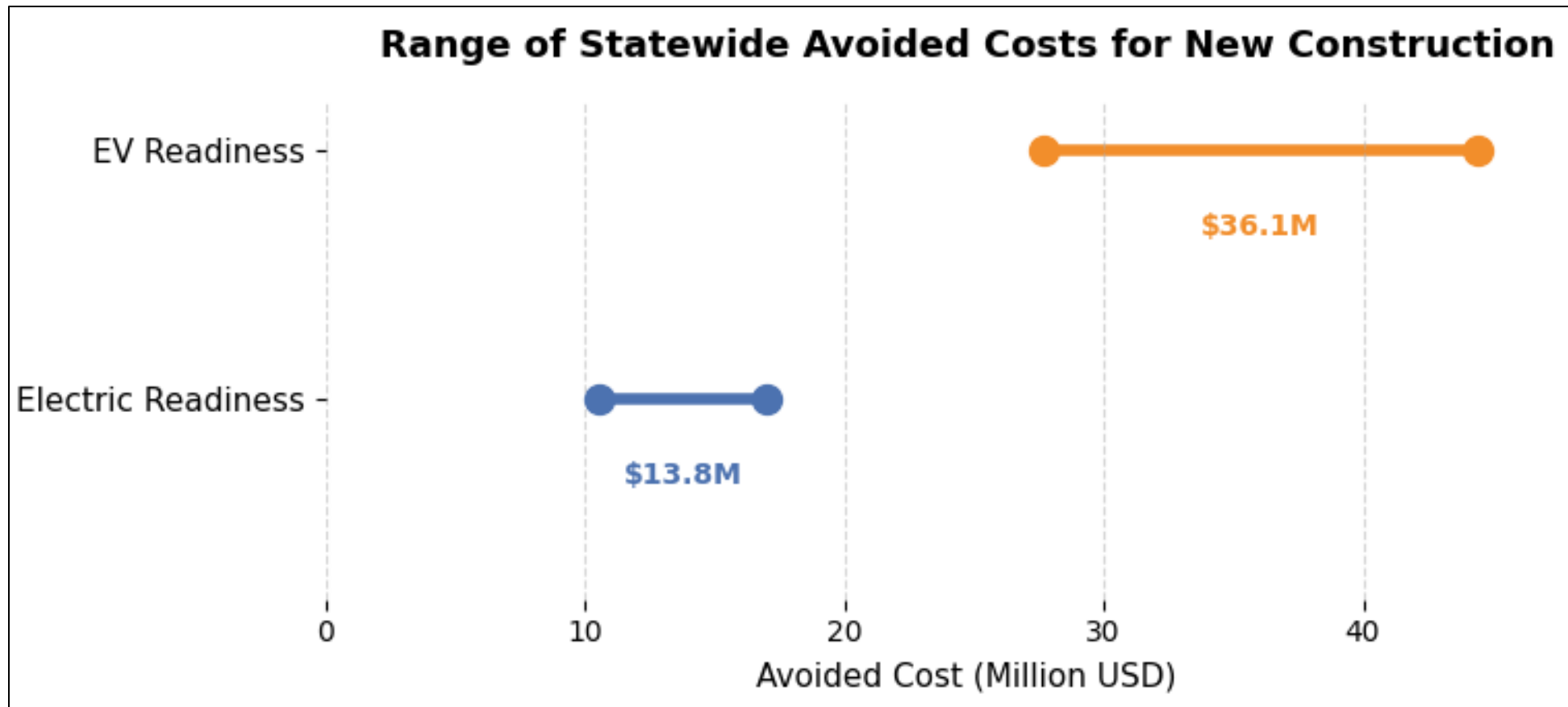
Source: [BLS](#) & RSMMeans 2025

Scaled Statewide Impact

- 1–2 family homes constructed annually in NJ: Ranges from 5,035 to 8,080 units in the last 12 months (NJ DCA data)

Avoided retrofit costs:

- Electric readiness: \$2,100 per home → **\$11M–\$17M** savings.
- EV readiness: \$5,500 per home → **\$28M–\$44M** savings.





Questions / Feedback



Thank You



For more information

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