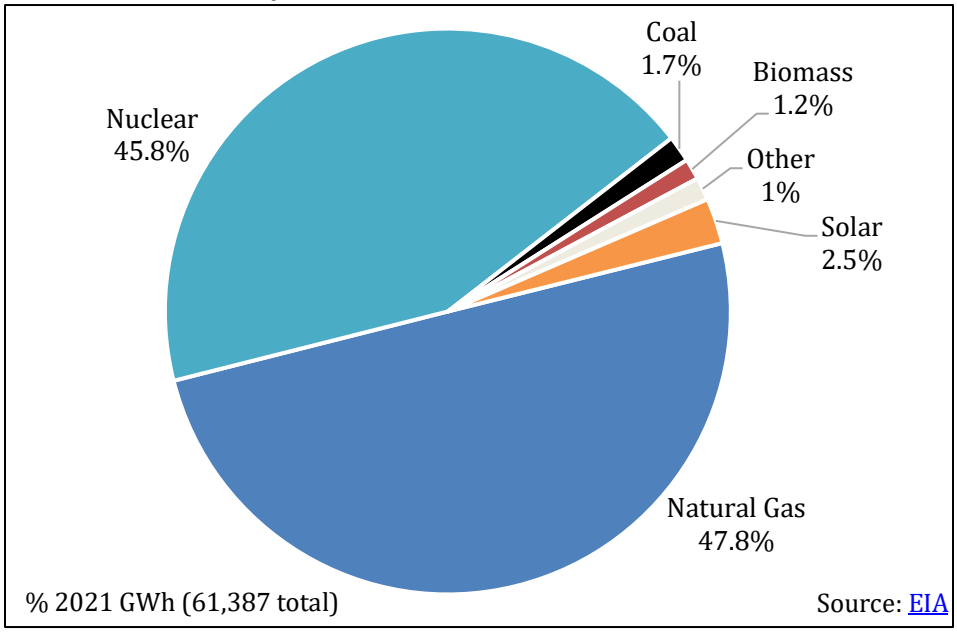
State Brief: New Jersey

BACKGROUND

New Jersey's electricity mix is comprised almost entirely of nuclear and natural gas, accounting for over 90% of the state's net generation in 2021. While the state has no fossil fuel reserves, it is home to two oil refineries, which receive oil via tanker, rail, and pipelines.
The Garden State has a mandatory Renewable Portfolio Standard (RPS) of 35% by 2025 and 50% by 2030. In 2018, Governor Phil Murphy's Executive Order No. 28, directed the creation of a 2019 Energy Master Plan to provide a blueprint for the state to achieve 100% clean energy by 2050.

New Jersey's Net Annual Electric Generation, 2021



% 2021 GWh (61,387 total) Source: EIA

By the middle of 2022, New Jersey had nearly 4,000 megawatts (MW) of installed solar capacity, the eighth highest in the country. In 2022, the Solar Energy Industries Association (SEIA) ranked New Jersey 15th in the nation for projected solar energy capacity growth. While a small fraction of New Jersey's renewable electricity is generated by wind, the state has significant offshore wind energy potential along its coastline. In 2019, Governor Murphy's Executive Order No. 92 increased the state's goal of 3,500 MW of offshore wind energy generation by 2030 to 7,500 MW offshore wind energy by 2035. By mid-2021, New Jersey's Board of Public Utilities had approved 3,700 MW of offshore wind power capacity.

The 2022 U.S. Energy and Employment Report found that New Jersey had 135,072 energy workers statewide in 2021 (3.4% of total state employment), which includes 34,585 workers employed in energy efficiency. In 2021, New Jersey ranked 23rd nationally for clean energy jobs, with 50,096 New Jerseyans employed by the industry.[1]

The New Jersey Board of Public Utilities (BPU) regulates the state's utilities. The bipartisan board is comprised of five commissioners, all of whom are appointed by the Governor. Currently, there are three Democrats and two Republicans on the Board. Democrats control both chambers of the state's legislature and Democratic Governor Murphy took office in January 2018.

POLICY STRENGTHS AND OPPORTUNITIES

The National Renewable Energy Laboratory (NREL) developed the notion of "policy stacking,"[2] an important framework for policymakers to consider. The basic idea behind policy stacking is that there is an interdependency and sequencing of state policy that, when done effectively, can yield greater market certainty, private sector investment, and likelihood of achieving stated public policy objectives.

In theory, but not always in practice, clean energy policies can be categorized into one of three tiers of the policy stack. Tier 1, market preparation policies, remove technical, legal, regulatory, and infrastructure-related barriers to clean energy technology adoption. Tier 2, market creation policies, create a market and/or signal state support for

[1] To see clean energy job numbers for your Congressional District, visit: https://cleanjobsamerica.e2.org/#map.
[2] V.A. Krasko and E. Doris. 2012. "Strategic Sequencing for State Distributed PV Policies: A Quantitative Analysis of Policy Impacts and Interactions." *National Renewable Energy Laboratory*. Available: http://www.nrel.gov/docs/fy13osti/56428.pdf.

clean energy technologies. Tier 3, market expansion policies, create incentives and other programs to expand an existing clean energy market by encouraging or facilitating technology uptake by additional market participants.

For example, before financial incentives for combined heat and power (CHP) will be successful, two key considerations for deployment are having clear interconnection standards and favorable stand-by rates for customers who opt to add CHP. In this example, states should adopt policies to address interconnection and stand-by rates before adopting financial incentive programs.

MODERNIZING UTILITIES AND EMPOWERING CONSUMERS

Digital technologies have enabled utilities to better manage the grid and provide opportunities for consumers to customize their services to fit their priorities. These technologies allow a two-way flow of information between the electric grid and grid operators and between utilities and their customers.

Emerging technologies improve system reliability and resiliency by enabling better tracking and management of resources. These technologies allow grid operators to incorporate central and distributed energy resources, energy storage technologies, and electric vehicles, and assist in addressing the challenges associated with planning, congestion, asset utilization, and energy and system efficiency.

On the customer's side of the meter, dynamic pricing, advanced metering infrastructure, and other technologies allow an exchange of information and electricity between a consumer and their electric provider. Grid modernization is associated with greater consumer choice by allowing customers to meet their energy priorities by producing their own energy or through contracting innovative clean energy services from different providers.

Grid modernization will require a suite of state and federal policy changes to support advancements in grid technologies, grid management, and utility regulation.

The BPU released the New Jersey Energy Master Plan in 2019, which focuses on grid modernization through electrification and integration of distributed energy resources as a backbone for the rest of the plan. The plan directs public utilities to develop integrated distribution plans (IDPs). In 2020, the BPU launched an investigation of resource adequacy alternatives to develop a strategy by which the state can meet its reliability, clean energy, and environmental objectives. Work group sessions were held between November 2020 and March 2021, and a final report, Alternative Resource Adequacy Structures for New Jersey, was released in June 2021. The report outlines policy recommendations for New Jersey to best meet its "resource adequacy needs in a manner consistent with the State's clean energy and environmental objectives, while considering costs to utility customers"

The Infrastructure Investment and Jobs Act of 2021 (IIJA) is a landmark federal spending bill that includes funding earmarked for grid modernization projects. This includes $11 billion for Department of Energy (DOE) grants directed specifically towards electric infrastructure resiliency projects (including grid hardening against severe weather and cybersecurity improvements), $2.5 billion for transmission development, and $3 billion for the Smart Grid Investment Matching Grant Program.[3] Enacted August 2022, the Inflation Reduction Act (IRA) set aside $2 billion for loans for constructing new high-capacity transmission lines and upgrading interties. The bill includes funding for technical assistance and grants for states and tribal governments, which includes assistance for siting transmission projects. The bill also directs DOE to undertake interregional transmission planning, modeling, and analysis, including analysis of transmission for offshore wind and the use of grid-enhancing technologies (GETs).[4]

There are policies that New Jersey's policymakers could adopt to support in-state grid modernization efforts:

1. Develop a grid modernization strategy through a stakeholder process. Alternatively, states might decide to require that utilities develop and propose a ten-year grid modernization plan to the public utilities commission within a specified timeframe. Utilities would then be required to implement that plan within another specified

[3] For more information on the grid-related earmarks included in the IIJA, see Potomac Law Group's January 2022 analysis: "The Infrastructure, Investment & Jobs Act of 2021: What's in It for You? (Part V: Grid Infrastructure and Resiliency)" https://www.potomaclaw.com/news-Infrastructure-Investment-Jobs-Act-of-2021-Whats-In-It-For-You-Part-V-Grid-Infrastructure-and-Resiliency.

[4] J. Runyon and J. Engel. 2022. "The Inflation Reduction Act is Signed into Law." *PowerGrid International*. 16 August. Available: https://www.power-grid.com/td/the-inflation-reduction-act-is-signed-into-law/#gref.

timeframe. Strategies and/or plans should outline a clear set of grid modernization goals and describe methods to measure, report, verify, and enforce progress towards those goals. States might also provide incentives or cost recovery mechanisms for utilities that meet grid modernization goals.

2. Require that utilities develop plans to increase smart meter deployment and demand response and/or demand-side management (DSM) programs, and measure and report on the results of grid modernization efforts. As part of this, the state might revisit and update its existing cybersecurity requirements. Utilities have taken the lead on residential smart meter deployment. In January 2021, the BPU approved the Public Service Electric & Gas' (PSE&G) $800 million plan to install 2.3 million smart meters as part of the company's plan to create an 'energy cloud' that tracks real-time outages by the end of 2024. Atlantic City Electric will install new smart meters for its nearly 565,000 customers as a part of its Smart Energy Network.

3. New Jersey does not have clear state policies governing customer data access and privacy protections. To address this, policymakers should develop legislation or rules that, at minimum, do the following: clarify who owns the energy data associated with consumer energy usage; protect customer privacy; outline the process for allowing direct access of data to third parties; and promote access to the highest resolution of data possible by third parties. The state could establish customer data access to energy data through the Green Button Connect program, for example. The 2021 BPU approval of PSE&G's smart grid expansion plan included a stipulation that customer data access issues would be discussed in a separate docket.

4. State departments of workforce services or their equivalent can be directed to work with utilities and other stakeholders to develop training programs for grid technicians and engineers. With new grid technology and distributed energy systems coming online, a new generation of workers can be trained to meet evolving needs, which will keep jobs local, and contribute to economic development.[5]

The adoption of incentives for or a requirement to integrate a certain amount of renewable energy and energy storage on the grid alongside enhanced building energy standards and electric vehicle policies can support grid modernization efforts.

MAINSTREAMING RENEWABLES

Renewable energy is increasingly seen as the least cost and lowest risk form of energy (excluding energy efficiency). With increased deployment, utilities are learning more about how to integrate renewables effectively, investors are becoming more comfortable with the technologies, and building code officials are recognizing common standards and best practices for integrating distributed renewable energy resources. In the U.S., the expansion of renewable energy has been one of the most consequential shifts in electricity generation over the last decade. The U.S. Energy Information Administration (EIA) predicts that most of the growth in U.S. electricity generation in 2022 and 2023 will be from new renewable energy sources. It is in the interest of policymakers to ensure that their states are well positioned to benefit from this shift.

While the IIJA doesn't provide money for specific renewable energy projects, the energy funding in the Act will benefit renewable energy development as grid resiliency, increased deployment of energy storage, and modernized transmission are all essential to the successful integration of renewable energy generation. The IRA appropriated $369 billion to fund a variety of energy and climate initiatives – the largest climate investment in U.S. history. The bill also extended the investment tax credit (ITC) and the production tax credit (PTC) through the end of 2024 and revived the PTC for solar projects. For projects placed in service in 2025, the bill "effectively extended" the ITC and PTC by creating new tax credits for zero emission facilities. The bill also extended the residential energy property tax credit through 2034 and created a new advanced manufacturing production credit, to apply to sales of components for constructing wind and solar energy facilities beginning in 2023. [6]

The IRA also includes several provisions related to energy equity, including $3 billion to the Environmental Protection Agency (EPA) for grants for community-led projects in disadvantaged communities and $27 billion for

[5] For a discussion of specific workforce needs that states might explore see: GridWise Alliance and U.S. Department of Energy. 2020. "Grid Modernization Index Insights into a Transformation: Principles for the Next Decade of Progress."

[6] For a detailed discussion of the IRA's tax provisions, see: A.S. Levin-Nussbaum. 2022. "Update: President Biden Signs Historic Legislation Providing Expansive Clean Energy Tax Incentives." *The National Law Review*. 17 August. Available: https://www.natlawreview.com/article/update-president-biden-signs-historic-legislation-providing-expansive-clean-energy.

nonprofit, state, and local climate finance institutions supporting the deployment of low- and zero-emission technologies. In support of rural communities, the bill includes a $1 billion appropriation to the U.S. Department of Agriculture (USDA) for loans to finance renewable energy projects, $1 billion for USDA's Rural Energy for America Programs, and $9.7 billion to USDA to finance rural electric cooperatives' purchases of renewable energy.

To reduce barriers to customer and utility participation in the renewable energy market, and to build upon the federal initiatives, policymakers in New Jersey might consider several options.

Customer-Oriented Policies

1. **Interconnection, Net Metering, and Streamlined Permitting** – In general, customers want a clear, streamlined, affordable, and predictable system for connecting renewable energy systems to the grid. To ensure this, New Jersey's policymakers could consider adopting the Interstate Renewable Energy Council's (IREC)'s model interconnection procedures, removing net metering system size limitations, allowing perpetual rollover of net metering credits, and increasing the aggregate cap.[7] The state might also consider building on existing standards to establish statewide standards for streamlined permitting of small solar and storage systems. Alternatively, the state might adopt incentives to support local governments that voluntarily implement a streamlined program. Currently, New Jersey allows for aggregated solar net metering, but only for public entities, such as state and local governments, schools, and local agencies. The state could update its policy to permit aggregated net metering for additional entities.

   In May 2021, NREL launched the SolarAPP+, an online platform designed to automate the solar permitting process. By running compliance checks and processing permit approvals, the service is intended to drastically reduce permit wait times. Currently restricted to rooftop solar, twenty communities in Arizona and California have adopted the platform, processing over 7,750 permits for more than 51 MW of generation with an estimated 7,750 hours saved in permit review time.

2. **Shared Renewables** – Due to building and property attributes and ownership issues, many customers are unable to install renewable energy technologies where they live or work. Allowing shared, or community, renewable energy projects addresses these barriers. These projects have multiple owners or subscribers who pay for a portion of the generation provided by the system. Under Assembly Bill 3723, signed by Governor Murphy in May 2018, BPU was required to adopt rules and regulations for a "Community Solar Energy Pilot Program." In April 2022, the BPU requested comments on the design of a permanent program.

   Low credit ratings often deter participation in renewable energy markets; this can affect low- and moderate-income (LMI) households' adoption of renewable energy solutions. Supportive policies for shared renewables can be designed to encourage participation by LMI households; this can increase adoption of renewable technologies and reduce energy costs. Low-income participation can be ensured either through a percentage mandate for the overall annual contracted capacity, or by offering a higher rate of payment for the portion of shared solar capacity attributed to LMI customers. States that have a shared renewable program may want to coordinate this program with implementation of the federal Weatherization Assistance Program (WAP) or the Low Income Home Energy Assistance Program (LIHEAP) to provide recipients of assistance with access to participation in a shared renewable system.

3. **Adapt Energy Assistance Programs –** Programs such as LIHEAP and WAP provide assistance for paying utility bills and reducing household energy costs. Including distributed energy resources as eligible for funding under these programs can reduce energy costs and increase energy security for those LMI families who are able to benefit from these programs. Colorado, for example, includes rooftop solar in their WAP program. For approval to add solar to a state's implementation of WAP, a state must show that the investment would be cost-effective – achieving a Savings to Investment Ratio (SIR) of 1.0 or more.[8] Since 2010, New Jersey has received $52.4 million

[7] In 2018, Assembly Bill 3723 set net metered aggregate capacity to 5.8% of the total annual kilowatt hours (kWh) sold in the state.
[8] For guidance on the state approval process, see WAP Memorandum 024 (2017), the Solar Template for Incorporating Solar Photovoltaics into WAP, and the Preliminary Assessment Guide for Integrating Renewable Energy into Weatherization (2019).

from WAP and $14.9 million from the State Energy Program (SEP) which has helped to fund a number of energy initiatives in the state.

4. **Fund Distributed Generation (DG) for Community Organizations –** Organizations or groups that provide support services for LMI communities can be provided funding to install solar or other distributed energy resources. Sites such as homeless shelters, food banks, clinics, and community centers often have enough rooftop area for solar installations. After installation, these resources can reduce an organization's utility bills, freeing up funds for other activities that support the community.

5. **On-Bill Financing/Pay As You Save (PAYS) –** On-bill Financing and Repayment programs enable consumers to invest in energy upgrades with no upfront payment. The utility or a third party will pay the initial costs to install the upgrade with the cost of that upgrade recovered through the utility bill. Because repayment includes consideration of the cost savings resulting from the energy upgrade, customers can see monetary benefits almost immediately. Once equipment costs are recovered, the equipment belongs to the customer. State policies that reduce lending risk by creating a loan loss reserve and/or a credit enhancement fund can encourage lending to customers that might otherwise not qualify for a loan and can keep interest rates low.

6. **Corporate Procurement** – Many Fortune 100 and 500 companies have established either climate goals or commitments to purchase renewable energy. Since 2016, over 41 gigawatts (GW) of renewable contracts have been announced by corporate entities. In 2020 alone, corporations signed 100 agreements for over 10 GW of renewable energy. This is leading policymakers to provide additional avenues for businesses to procure renewable energy. New Jersey's deregulated market offers customers a choice of hundreds of different electricity plans, which vary by the amount of renewable energy included. New Jersey's policy allows companies to purchase RECs or renewable energy through retail market access, enter into onsite power purchase agreements (PPAs), and develop or lease onsite renewable energy projects. New Jersey's policy makers might consider encouraging corporate participation in shared renewable projects.

Utility-Oriented Policies

Some states have created programs that aim to reduce greenhouse gas emissions and increase investments in clean energy resources. Utilities are also setting their own GHG reduction goals and are increasingly investing in clean energy resources. New Jersey has a mandatory RPS of 35% by 2025 and 50% by 2030. Enacted in 2007, Assembly Bill 3301 set an emissions target of 1990 levels by 2020 and 80% below 2006 levels by 2050. While New Jersey met the 2020 greenhouse gas emission targets, significant action will be necessary to meet the 2050 goal. New Jersey is a member of the Regional Greenhouse Gas Initiative (RGGI), an emissions trading program that reduces the region's carbon emissions and incentivizes the development of energy efficiency measures and renewable energy projects.

To increase utility adoption of clean energy technologies, New Jersey's policymakers might consider the following:

1. **Accelerating and Amending Renewable Portfolio Standards –** States can revisit existing RPS policies to increase targets and/or accelerate target dates to continue to spur the development of renewable resources and save ratepayers money. Additionally, states might add one or more carve-outs to further incentivize the development of distributed generation and offshore resources. Embedding an RPS within broader clean electricity or emissions standard can allow technological flexibility.

2. **Clean Peak Standards (CPS) –** Clean Peak Standards aim to increase the share of clean energy resources used to meet peak demand and decrease energy bills over the long-term by reducing peak demand in the hours when energy costs are highest. These objectives can be met through different policy options, including planning and procurement that focuses on peak demand; a moratorium on the construction of new peaking units or a phase out of existing units; incentives – including carve-outs in states with RPSs – for clean energy resources delivered during peak times; and/or adopting a new clean peak standard that sets a target for clean energy deliveries during peak times.

ENERGY STORAGE

Energy storage offers a unique opportunity to dynamically manage supply and demand while also maximizing the value of grid resources. By deploying storage to strategic locations, utilities can more effectively manage their

energy portfolios. First, storage allows utilities to manage intermittent demand – helping reduce peak demand requirements. Because the generation resources that provide peak power are the system's most expensive, reducing peak demand can save consumers money. Second, the responsiveness of energy storage can allow utilities to implement voltage regulation and other ancillary services, which improve system efficiency. Third, because storage technologies can both store and dispatch power, storage enables better integration of intermittent power generation resources, like wind and solar, to the grid.

The flexibility of battery storage combined with advanced metering infrastructure can allow customers to control how and when they use energy from the grid or from solar panels installed on their home or business. In most cases, this can provide greater cost savings than standalone solar systems. Combined with time-varying rates or real-time pricing programs, state policy can further support customer choice and open a new market for energy services. Prices that better reflect the time-varying and location-dependent costs of producing and delivering electricity can also lead to a number of economic and environmental gains.

Energy storage can also help the commercial sector avoid demand charges, which establish an incremental cost above energy usage based on the highest period (highest 15 minutes, for example) of demand during the month. Eliminating spikes in demand with storage can reduce these costly charges for businesses. As utilities around the country consider implementing or extending demand charges to other sectors, energy storage will become more relevant as both a customer cost-saving investment and a system efficiency measure.

Declining costs and technological advancements in battery storage have contributed to increased deployment. State policies can further encourage this by establishing both a framework for easy integration of energy storage resources onto the grid and a marketplace that monetizes the benefits of energy storage for cost-effective investment.

New Jersey is one of ten states that has an energy storage goal. Assembly Bill 3723, enacted in May 2018, required the BPU to initiate a proceeding to establish a process to achieve a goal of 600 MW of energy storage by 2021 and 2,000 MW of energy storage by 2030. This energy storage goal was seen as one of the most aggressive goals in the nation. However, the state has made little progress on the goal thus far, as the BPU has yet to launch an energy storage proceeding. In mid-2021, the BPU solicited comments for revision of its solar energy incentive programs, through the Solar Successor Program: Staff Straw Proposal. The Straw Proposal included competitive solicitations for solar-plus-storage hybrids and incentives for energy storage systems. The state previously offered financial incentives for the development of additional energy storage through its Renewable Electric Storage Program, however, the program is not currently funded or accepting new applications.

The IIJA provides a unique opportunity for funding energy storage projects. According to an analysis by the Energy Storage Association, the IIJA provides $505 million for grants to support energy storage demonstration projects, $6.15 billion for building out the U.S. battery supply chain, and $14.7 billion for grid resilience programs that include energy storage as a qualified technology. The IRA extended the ITC to include standalone energy storage systems. When the ITC is replaced by the technology neutral Clean Electricity Investment Tax Credit (CEITC) in 2025, qualified storage facilities placed in service after 2024 will remain eligible. The advanced manufacturing production credit, established by the bill, will apply to battery cells and modules and the critical minerals used in their production. The $27 billion GHG Reduction Fund, also established by the bill, will provide funding enabling low-income or disadvantaged communities to adopt zero-emission technologies including energy storage.

There are several policy opportunities to take advantage of the growing technological advances in and declining costs of energy storage and build upon recent federal initiatives. The recommendations here draw heavily from IREC's 2017 report, "Charging Ahead – An Energy Storage Guide for Policymakers." Policymakers in New Jersey could consider the following:

1. Amend existing interconnection policies to ensure that storage can connect to the grid through a transparent and simple process. IREC has produced a series of interconnection protocols that states can easily adopt. The state could establish best practices for interconnection in statute, or legislation could provide an instruction to the BPU to implement these best practices.

2. Instruct the utilities commission to evaluate the value of energy storage in multiple strategic locations across the utility system and consider a requirement to deploy storage where it is cost-effective or identify the price point

at which it will be cost-effective. Ensure that cost-effectiveness calculations include all the benefits storage can deliver to the system, including frequency regulation and avoided investments in new infrastructure.

3. Require the inclusion of energy storage as a critical piece of the energy system as both a demand and supply management resource. Some states have required that utilities evaluate the cost effectiveness of non-wires alternatives (NWAs) to large transmission and generation investments.

4. Finance and incentivize energy storage for customers and utilities. Incentives could enable customers to use storage to manage their electric load and store locally produced renewable energy. Incentives in the form of rebates, grants, and tax credits can provide a bridge to scalable deployment of storage. Incentives can be designed to decline as storage values become more readily monetized and/or as the cost of storage decreases. Policymakers could allow utilities that provide incentives to customers to recover the costs of installing smart meters. This would enable dynamic and time-varying energy management from multiple distributed battery systems. This could also signal to customers the value of leveraging storage and better align customer costs with system costs. Financing energy storage installations for commercial customers could help reduce their demand charges. Policymakers might want to start first with a policy that provides grants to pilot projects. Policy might also target solar system owners. Financial incentives should be designed to ensure that the state will meet other goals including emissions and peak demand reductions, and equitable access to clean energy. New Jersey's policymakers might consider renewing funding for the state's Renewable Electric Storage Program,

5. Clear data access policies that allow third parties to provide energy management services based on signals from the utility can greatly increase the value of efforts to monetize the value stream offered by energy storage. State policy should include measures to protect customer data, while also encouraging the use of this information to facilitate additional improvements to grid management and customer services. To address this, policymakers can develop legislation or rules that clarify who owns the energy data associated with customer energy usage; protect customer privacy; outline the process for allowing direct access to data by third parties; and promote access to the highest resolution of data possible.

THE BUILT ENVIRONMENT

In the U.S., buildings consume nearly 40% of total energy used.[9] Because it reduces energy demand and emissions, and creates savings for utility customers, energy efficiency[10] often plays a prominent role in state energy and climate policies. Coupled with beneficial electrification, which involves replacing direct fossil fuel use with electricity, there is even greater potential to reduce energy costs and pollution, and provide more resilient, comfortable, and healthy buildings. This is especially the case in states where increasing levels of low carbon resources are supplying the electric grid. When policies are adopted to shift energy uses based on fossil fuels (such as natural gas) for building heating, water heating, and appliances, to highly efficient electric alternatives, states can maximize achieving the dual objectives of increased energy efficiency and reduced emissions. In some cases, this can also result in lower energy costs.

New Jersey has taken several steps to incorporate energy efficiency and beneficial electrification into its built environment. New Jersey's Office of Clean Energy (OCE) administers the New Jersey Clean Energy Program (NJCEP), and in collaboration with the BPU, offers a variety of programs that incentivize energy efficiency for homeowners and commercial, industrial, and local government entities.

The Clean Energy Act of 2018 mandates that by next year the BPU require commercial building owners and operators over 25,000 square feet to use the EPA ENERGY STAR Portfolio Manager tool to benchmark their energy usage. The BPU, with the Rutgers Center for Green Building, are analyzing cost-effective amendments to several New Jersey energy subcodes to encourage beneficial electrification measures in both new and existing buildings.

The IIJA provides $500 million for grants to fund energy efficiency and renewable energy upgrades in public schools, $3.5 billion for the Weatherization Assistance Program, and further funds the Energy Efficiency and Conservation Block Grant program by $550 million and the State Energy Program by $500 million. The IRA appropriates $4.3

[9] For additional information, see ACEEE Building Policies and Codes.
[10] Energy efficiency includes a multitude of measures to reduce the energy consumption of a building. These measures range from installing energy efficient appliances to full building renovations updating a building envelope.

billion to DOE for an energy efficiency rebate program that will be administered through state energy offices. Another $4.3 billion appropriation will fund electrification rebates for single- and multi-family homes. The bill also extends the tax credits for residential energy efficiency improvements and new efficient home construction and increases the maximum deduction for energy efficient commercial buildings. A $837.5 million appropriation will be used by the Department of Housing and Urban Development (HUD) for resiliency, energy efficiency, renewable energy, and grid integration projects at public housing units.

Policymakers in New Jersey can consider a variety of policies to encourage energy efficiency and beneficial electrification:

Energy Efficiency Policies

1. **Building Codes –** The Department of Energy projects that, over time, improvements in building codes can have the greatest single impact in energy efficiency within the built environment. On average, commercial buildings waste 30% of energy used.[11] Because buildings will be around for generations, energy efficiency within the built environment is a matter of statewide and long-term importance. States can set requirements for energy systems, require statements of energy use, and set performance standards for energy use or emissions. Building codes can be required by state legislation or implemented through 'home rule', where local governments set their own standards or adopt more strict building codes than those mandated by the state.

   New Jersey has adopted, with amendments, the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) 90.1-2019 standards and the 2021 International Energy Conservation Code (IECC) as its mandatory residential and commercial building energy codes.

   The IIJA appropriated $225 million for a competitive grant program to support the "sustained cost-effective implementation of updated building energy codes." The grant program will run for five years, through fiscal years 2022 – 2026. On July 21, 2022, DOE issued a Notice of Intent (NOI) to publish a funding opportunity to support the implementation of "resilient and efficient" building energy codes. This competitive grant program requires the participation of a "relevant state agency" and projects must be tied to "an updated building energy code."

2. **Appliance Efficiency Standards** – Appliance efficiency standards set minimum requirements for efficiency in everything from washing machines to water heaters. Efficiency standards save consumers money on utility bills and reduce energy demand on the grid, most importantly reducing peak energy demand. Some states have elected to adopt the federal appliance standards that were in effect on January 1, 2017.[12] These include, among other things, standards on metal halide lamp fixtures, residential furnaces and boilers, and external AC to DC power supplies. While New Jersey has implemented some appliance efficiency standards, policymakers could consider updating the state's standards.

3. **Energy Saving Performance Contracts (ESPCs)** – ESPCs are a financing mechanism for energy efficiency upgrades. ESPCs are often used within large institutions, such as college or government campuses, allowing them to meet their energy and environmental goals. An energy service company will pay the upfront cost of efficiency upgrades and execute the project, often guaranteeing the projected energy savings. The large institution will then pay back the service company with savings from their utility bills. This allows institutions to pay for their upgrades from their operating budget, instead of finding new financing, such as loans or bonds, for capital upgrades. Essentially, they pay their upgrade costs with their energy savings.

   Since 2009, New Jersey has permitted ESPCs for government entities through the New Jersey Energy Savings Improvement Program (ESIP). As of August 2020, New Jersey had 127 approved ESIP projects, equaling $1.06 billion in total contracts worth $1.30 billion in annual savings.

4. **Low-Income Energy Efficiency Programs –** While equity should be incorporated into all policy development, it is often necessary to ensure that specific programs are targeted towards historically underserved populations. Recent research suggests that weatherization can reduce energy use by 25-35%, allowing households to reduce their financial energy burden. The federal Weatherization Assistance Program (WAP) provides energy efficiency

[11] For more information, see the Office of Energy Efficiency & Renewable Energy's Commercial Buildings Integration (CBI) Program.
[12] Based upon research conducted by the Center for the New Energy Economy.

upgrades for income qualified homeowners. However, in many states there is difficulty in reaching individuals who may be eligible. Lawmakers can pass legislation requiring outreach and education to groups eligible for WAP. New Jersey offers several assistance programs for low-income residents.

5. **Energy Efficiency Resource Standards (EERS)** – EERS require utilities to demonstrate a reduction in energy demand from programs offered to their consumers. Because this means selling less energy and reducing revenues, there is not always an incentive for utilities to make their consumers more productive or efficient users of energy. If legislatures want to ensure a more productive and efficient energy distribution system that takes advantage of the latest technological innovations, they may want to require that a utility demonstrate a percent reduction in demand through efficiency or "demand side" programs. Legislators can also instruct their utility commissions to consider energy efficiency when approving rate cases by allowing cost-recovery of energy efficiency improvements on utility bills. New Jersey adopted an EERS in 2018 when Governor Murphy signed the Clean Energy Act of 2018 (Assembly Bill 3723) into law. Currently, annual savings targets are set at 2.15% for electric and 1.1% for gas utilities.

6. **Revenue Decoupling and Performance-Based Incentives –** Utilities earn revenue by selling energy. As a result, there is little to no incentive for them to promote energy efficiency because it leads to a reduction in sales, and therefore a reduction in revenue. Revenue decoupling disconnects revenue from the amount of energy sold. This provides utilities a set amount of revenue regardless of the amount of energy sold. While this does not directly incentivize energy efficiency, it does remove the inherent disincentive to promote energy efficiency.

   Incentive policies can be layered on top of a decoupling policy. For example, if a utility meets set energy reduction targets, performance-based incentives, as determined by a state's PUC, can provide monetary rewards for meeting those targets. New Jersey allows utilities to recover the costs of their energy efficiency programs and provides performance-based incentives for meeting energy efficiency targets.as the electricity generation mix changes, it is important to incorporate a regular review of decoupling and incentive policies to ensure they are still meeting their intended purpose. The BPU has established a triennial review process for the energy use reduction targets, metrics, and incentive and penalty structure, among other things.

Electrification Policies

1. **Strategically Target Beneficial Electrification** – Target areas of beneficial electrification in buildings include space and water heating systems and other systems and appliances that typically use natural gas or another fossil fuel as an energy source. According to the Environment and Energy Study Institute, new electric heat pump technology can heat space and water at efficiencies of 200 to 300%, compared to 67% efficiency in typical Energy Star gas water heaters.[13] This not only allows savings on energy bills, it also results in reduced greenhouse gas emissions and improved indoor air quality.

2. **Adopt Tools for Advancing Electrification** – Building codes and financial incentive programs can be used to advance beneficial electrification. While in some states, local governments are primarily responsible for adopting and implementing building energy codes, in other states, a state legislature, or a code commission tasked by the legislature, adopts and implements statewide standards. Incentive programs established and implemented by states, local governments, or utilities can target replacing systems and appliances that traditionally rely on fossil fuel resources with high efficiency electric systems and appliances including water heaters, furnaces, ovens, and ranges. As an example, heat pump water heaters and space heating systems are being promoted as high efficiency replacements for traditionally fossil-based equipment. In conjunction with utility regulatory policy, these technologies can also serve as demand response management tools by utilities in exchange for compensation to the ratepaying customer.

   As a note, cities across the country are implementing new building codes promoting beneficial electrification by limiting or banning the installation of natural gas in new construction. State legislatures can pass enabling legislation, allowing municipalities to make independent decisions on beneficial electrification. On the other

[13] For more information, see EESI's Beneficial Electrification.

hand, some states have adopted pre-emptive legislation, banning local governments from adopting policies that limit utility service.[14]

Programmatically, there will always be greatest benefit by combining measures – incentives that bundle improvements will generate greater gains than individual measures. For example, a high efficiency heat pump will be much more effective and efficient when coupled with improved building insulation. Rather than only realizing the gains of the new mechanical component, this combination of measures will increase the efficiency of the entire system.

ELECTRIFICATION OF THE TRANSPORTATION SECTOR

Bloomberg New Energy Finance estimates that nearly 80% of new car sales in the U.S. will be electric by 2040. Therefore, a key part of building a modernized grid involves designing infrastructure that will facilitate easy connection of electric vehicles (EVs) to the grid. One of the most important barriers to increased adoption of EVs is the consumer's awareness of the availability of EV charging stations. Ultimately, drivers want to be sure that their car will get them where they need to go. The good news is that both supportive policies for developing charging infrastructure and technological advancements have eased "range anxiety." The American Council for an Energy-Efficient Economy (ACEEE) published a State Transportation Electrification Scorecard in 2021 that evaluates states' progress in electrifying transportation in six key policy areas and offers nationally applicable policy recommendations. New Jersey ranked 10th out of the 31 states evaluated in this report.

The New Jersey Bureau of Mobile Services maintains the Drive Green New Jersey database, which provides basic information on EV ownership, charging, financing, and existing state and utility programs. There are several incentives available to New Jerseyans to promote EVs. These include a zero emissions vehicle tax exemption, a high occupancy vehicle lane exemption and discount, an EV toll discount, and rebate and grant programs. In 2020, the Charge Up New Jersey program for point of purchase and post-sale incentives was overwhelmingly popular. These incentive programs were supplemented by $100 million from RGGI funds and Volkswagen Mitigation Trust Funds for use in electrification, equitable mobility, and charging infrastructure in communities throughout New Jersey. Commercial property assessed clean energy (C-PACE) was authorized in New Jersey in 2021, and EV charging infrastructure is included as an eligible project.

In July 2022, Governor Murphy announced that the state will use approximately $60 million from the Clean Energy Fund to further incentivize EVs. These funds will include a payment of up to $4000 to New Jersey residents who purchase an EV and $250 to help fund a residential charging station. Four million dollars of these funds will go toward incentives for apartment buildings and condominiums to install charging stations for their residents use. Assembly Bill 22-1282, enacted in August 2022, requires the New Jersey Department of Environmental Protection (DEP) to implement a three-year Electric School Bus Program to provide funding to purchase electric school buses and charging infrastructure.

In 2020, New Jersey joined 14 other states and the District of Columbia in signing an MOU to support the deployment of medium- and heavy-duty ZEVs and create a Multi-State ZEV Task Force In July 2022, the Task Force published the Multi-State Medium- And Heavy-Duty Zero-Emission Vehicle Action Plan. The state has also adopted California's zero emissions vehicle (ZEV) and low emission vehicle (LEV) standards.

The IIJA provides nearly $5 billion over the next five years to support the electrification of the transportation sector. In 2022, $615 million will be made available for the installation of charging stations along designated alternative fuel corridors. The Act also provides approximately $1.1 billion for grants to state and local governments to assist with the purchase or lease of low- or no-emission vehicles for transportation fleets. To be eligible, a state must have a Zero-Emission Fleet Transition Plan in place.

The IRA extended the $7,500 EV tax credit for purchases of new plug-in EVs through 2032 and removed the eligibility cap based on number of vehicles sold by manufacturers. The Act includes requirements for material sourcing that must be met by manufacturers starting in 2027. The IRA also created a new $4,000 refundable tax credit for the purchase of used EVs and a new credit for commercial EVs. Appropriations in the Act include $1 billion for replacing

[14] See, "Battle Brews over Banning Natural Gas to Homes." The Wall Street Journal, 1 June 2021, https://www.wsj.com/articles/battle-brews-over-banning-natural-gas-to-homes-11622334674.

medium- and heavy-duty vehicles with EVs, $3 billion to fund projects to reduce transportation sector emissions, and $3 billion to procure alternatively fueled vehicles for the federal fleet.

There are additional opportunities to expand the market for EVs in New Jersey:

1. **Charging Infrastructure Plan** – Locating charging infrastructure is different from locating conventional fueling stations. While some drivers will need to charge more quickly, others will refuel when they are parked for longer periods of time, for example when shopping at the mall or going to work. Charging infrastructure plans should attempt to pair the appropriate level of charging (level 2 or direct current fast charging) with a reasonable amount of time a person will be at that location. The New Jersey Department of Environmental Protection, the BPU, and the New Jersey Economic Development Authority signed a memorandum of understanding (MOU) in 2019 to develop a plan to meet the state's goal of 330,000 registered EVs by 2025. Through the New Jersey Partnership to Plug-In, state agencies are working on serval initiatives that complement the development of a comprehensive charging infrastructure plan. The ChargEVC program is aimed at identifying high impact EV market development strategies.

   Regional collaborations around the U.S. are emerging to coordinate the development of EV transportation and charging infrastructure. In May 2018, New Jersey joined 11 other states and the District of Columbia to release the Northeast Corridor Regional Strategy for Electric Vehicle Charging Infrastructure. The states in this region, from D.C. to Maine, will collaborate to invest in public EV charging infrastructure, promote EV sales across the region, and develop complementary policies and programs. Part of this strategy includes a public-private partnership with automakers. New Jersey is also a member of the Transportation and Climate Initiative (TCI), comprised of 13 Northeast and Mid-Atlantic States and the District of Columbia, which is exploring regional policy options to reduce emissions from the transportation sector. New Jersey's utilities have joined the National Electric Highway Coalition (NEHC), committed to creating a network of fast charging stations across the country.

   The IIJA included a new National Electric Vehicle Infrastructure (NEVI) formula grant program to provide dedicated funding to states to deploy charging infrastructure with the goal of creating an interconnected network of vehicle charging stations across the nation's highways. To be eligible to receive funding, states must develop and submit a NEVI plan to the Federal Highway Administration (FHWA) by August 1, 2022. NEVI funds cannot be obligated until a state's plan is approved by the FHWA. New Jersey developed and submitted (on July 29, 2022) a NEVI state plan to coordinate the use of New Jersey's expected allocation of $104 million in formula funding from the IIJA.

2. **Parking Infrastructure Requirements** – In tandem with the development of a statewide plan, legislation could set requirements for parking lots and other infrastructure. Some states have adopted permitting standards for parking lots, requiring, for instance, that for every 100 parking spaces, there must be at least one EV charging space. Legislation could also incentivize utilities to develop make-ready locations. These locations supply power to the point where a utility or third-party developer might install an EV charging station. Adopted in 2021, developers of single-family residences in New Jersey that include designated parking must offer to install charging equipment unless such equipment is already included in the sale of the property. New Jersey could also update its Statewide Building Energy Codes to include requirements for EV charging infrastructure.

3. **EV and Charging Equipment Financing and Financial Incentives** – In addition to current incentive programs, New Jersey's policymakers might consider adopting programs to incentivize the purchase of used EVs. With increasing battery capacities and falling prices, there are an increasing number of EVs with relatively low milage that are being traded in. States might also consider programs that target low- and moderate-income (LMI) customers that may not qualify for a loan directly. Such a program could facilitate sales through such things as loan loss reserve and interest buy down programs.

NEWS

- August 31, 2022: Health Experts Demand Murphy Speeds Up Switch To Green Energy
- August 30, 2022: New Nonprofit to Enhance Equitable Access to Clean Energy Jobs in Middlesex County and across NJ
- August 18, 2022: Questions About Cost Remain after Release of New Jersey Clean Energy Study
- August 12, 2022: Clean Energy, Climate Change Focus of Joint Legislative Hearing

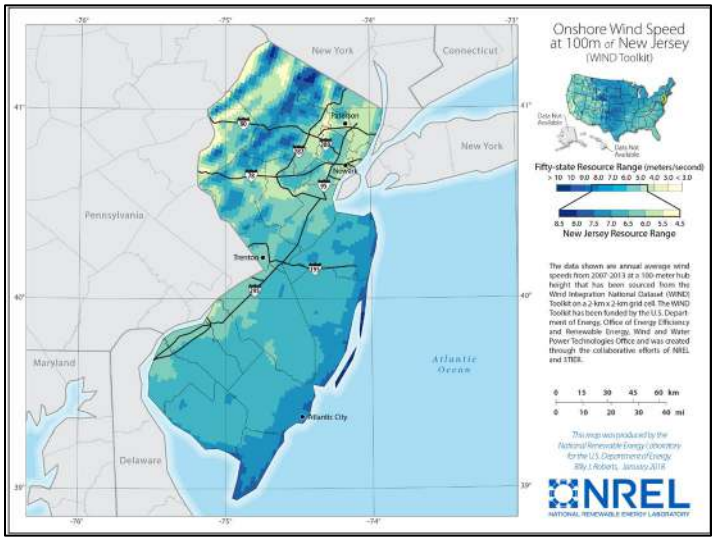
- August 6: N.J. is Offering up to $4K to Help You Buy an Electric Car. Here's What You Need to Know
- August 4, 2022: Governor Murphy Signs Legislation Requiring Establishment of Electric School Bus Program
- August 3, 2022: Offshore Wind: Major Manufacturing Facility Could be Coming to N.J.
- August 3, 2022: New Jersey School District Gets 390 KW of Solar Power on Two Schools

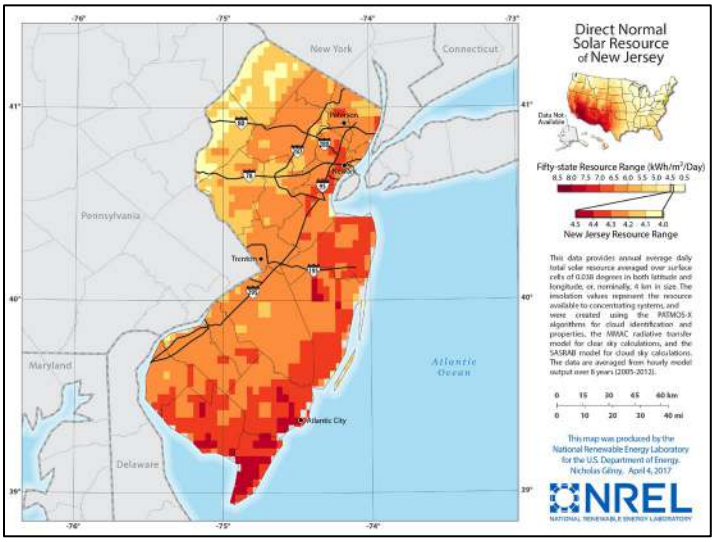
OTHER RESOURCES

- New Jersey's Clean Energy Program: https://www.njcleanenergy.com/
- American Clean Power Association, New Jersey State Fact Sheet: https://cleanpower.org/wp-content/uploads/2022/07/New-Jersey_clean_energy_factsheet.pdf
- The American Council for an Energy-Efficient Economy State and Local Policy Database, New Jersey: https://database.aceee.org/state/new-jersey
- The Database of State Incentives for Renewables and Efficiency, New Jersey: https://programs.dsireusa.org/system/program?state=NJ
- U.S. Department of Energy's Alternative Fuels Data Center, New Jersey: https://www.afdc.energy.gov/states/nj
- U.S. Energy Information Administration, New Jersey: https://www.eia.gov/state/?sid=NJ
- SPOT for Clean Energy, New Jersey: https://spotforcleanenergy.org/state/new-jersey/

NEW JERSEY'S WIND AND SOLAR RESOURCES

WIND https://windexchange.energy.gov/states/nj





Our Resources

CNEE Homepage: https://cnee.colostate.edu/

The SPOT for Clean Energy: https://spotforcleanenergy.org/

The Advanced Energy Legislation (AEL) Tracker: https://www.aeltracker.org/

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