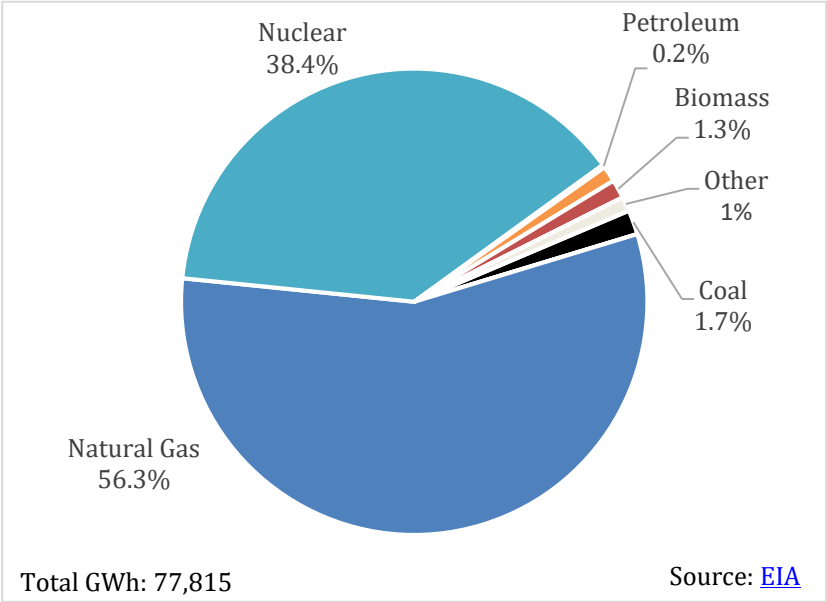
State Brief: New Jersey

BACKGROUND

New Jersey's Energy mix is comprised almost entirely of nuclear and natural gas. While the state has no fossil fuel reserves, it is home to three oil refineries, which receive oil via tanker, rail, and pipelines.

New Jersey's Electricity Mix 2016



Total GWh: 77,815 Source: EIA

While a small fraction of New Jersey's renewable electricity is generated by wind, the state has great potential for offshore wind energy along its coastline. In fact, the state was the first to establish a mandate for wind production, setting a target for 1100 megawatts (MW) by 2012. This year, Governor Murphy issued an executive order setting a goal of 3,500 MW of offshore wind energy generation by 2030. At the end of 2016, New Jersey ranked fifth among the states in net solar generation. The Garden State has a mandatory Renewable Portfolio Standard (RPS) of 35% by 2025 and 50% by 2030. Governor Murphy also issued Executive Order No. 28, stating the 2019 Energy Master Plan will provide a blueprint for 100% clean energy sources by 2050.

The New Jersey Board of Public Utilities (BPU) regulates New Jersey's investor-owned utilities. The board is comprised of five commissioners, all of whom are appointed by the Governor. The state requires that no more than three board members belong to the same political party. Currently, there are three Democrats and two Republicans. Democrats are in control of both legislative chambers and Democratic Philip Murphy was elected to the Governor's office this January.

POLICY STRENGTHS AND OPPORTUNITIES[1]

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 clean energy technologies. Tier 3, market expansion policies, create incentives and other programs in order 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

[1] For more information on policy opportunities, please visit the SPOT for Clean Energy. For more information on specific policy actions related to these opportunities, please review the *Clean Energy Policy Guide for State Legislatures*.

[2] V.A. Krasko and E. Doris, *National Renewable Energy Laboratory*, 2012. Strategic Sequencing for State Distributed PV Policies: A Quantitative Analysis of Policy Impacts and Interactions. http://www.nrel.gov/docs/fy13osti/56428.pdf.

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.

GRID MODERNIZATION

Policymakers can view grid modernization as creating a policy structure that supports and ties together many other initiatives, such as smart metering infrastructure, customer data management, energy storage, electric vehicle infrastructure, and utility business models.

In the last two decades, new 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, 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, advanced metering infrastructure, dynamic pricing, and other emerging technologies allow an exchange of information and electricity between a consumer and their electric provider.

In terms of state efforts to modernize the grid, there is room for improvement in New Jersey. According to GridWise Alliance's latest Grid Modernization Index, New Jersey ranks 24th overall for state support, customer engagement, and grid operations. New Jersey's Energy Master Plan addresses grid modernization and reliability, which helps provide a platform for future progress. However, there are additional supportive policies that policymakers could adopt to begin in-state modernization efforts.

1. Develop a grid modernization strategy through a stakeholder process. States may also decide to require that utilities propose a ten-year grid modernization plan within a specified timeframe. Legislation could require plans to 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 to meet grid modernization goals.

2. Require that utilities' develop plans to enhance cybersecurity, integrate distributed energy resources (including electric vehicles and energy storage), 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. Utilities have taken the lead on residential smart meter deployment, and last year the New Jersey BPU approved Rockland Electric's proposal to provide smart meters to 74,000 customers.

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 by third parties. The state could establish customer access to energy data through the Green Button Connect program, for example.

The adoption of incentives for or a requirement to integrate a certain amount of energy storage on the grid alongside enhancing renewable energy and electric vehicle policies would support modernization efforts and improve the chances of successful grid modernization.

ENERGY STORAGE

Energy storage offers a unique opportunity to dynamically manage supply and demand while maximizing the value of grid resources. By deploying storage in strategic locations, utilities can more effectively manage their energy portfolios. First, storage provides management of intermittent demand – helping to flatten peak demand requirements for the utility. Second, the responsiveness of energy storage can allow the utility to implement voltage regulation and other ancillary services, which are useful for improving system efficiency. Third, storage can dispatch power to better integrate intermittent resources like renewable energy. Finally, energy storage can help the

commercial sector avoid costly demand charges. As utilities around the country consider extending demand charges to the residential sector, this will become an even more important issue.

The flexibility of battery storage, combined with advanced metering infrastructure, allows 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 lead to a number of economic and environmental gains.

Storage provides multiple benefits to both the customer and the utility. State planning and regulatory policies can help maximize these benefits by 1) establishing a framework for easy integration of energy storage into the grid and 2) establishing a marketplace that monetizes the benefits of energy storage for cost effective investment.

New Jersey is one of five states that currently has an energy storage goal. A.B. 3723, enacted in May 2018, requires the BPU to conduct an energy storage analysis in the state. Following the energy storage report, the Board is required 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 is currently seen as one of the most aggressive goals in the nation. The state also offers financial incentives for the development of additional energy storage. The state ranks fifth in the nation for installed solar capacity, which, combined with some utilities' time of use rate programs, creates a good foundation for storage as a distributed energy technology. There are a few additional opportunities for developing supportive state policies:

1. Amend existing interconnection policies to ensure that storage can connect to the grid through a transparent and simple process. The Interstate Renewable Energy Council (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 utilities to implement these best practices.

2. 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. Alternatively, states might want to require utilities to develop a distribution investment plan that identifies the locations on the distribution system where energy storage or other distributed resources would offer the greatest value.

3. Further 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 for storage. Incentives can be designed to decline as storage values become more readily monetized. 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 should signal to customers the value of leveraging storage while better aligning customer costs with system costs. Financing energy storage installations for commercial customers would help reduce their demand charges. Policymakers might want to start first with a policy to incentivize solar systems owners.

MAINSTREAMING RENEWABLES

As the renewable energy industry has matured, technology has improved, and global production of generating equipment has increased, renewable energy is increasingly seen as the least cost and lowest risk form of energy (excluding energy efficiency). A Bloomberg New Energy Finance report from this year predicts that at least 50% of total global electricity will be renewable by 2050. 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 these reasons, it is in the interests of policymakers to ensure that their states are well positioned to benefit from the transition to clean and sustainable energy resources. To reduce barriers to customer and utility participation in the renewable energy market, New Jersey might consider several policy 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 IREC's model interconnection procedures or removing net metering system size limitations. The state might also consider establishing either statewide standards for streamlined permitting processes, or resources to support local governments that voluntarily implement a streamlined program. State incentives, such as tax credits, financial incentives, or loans can be tied to systems that are established within a designated streamlined permitting jurisdiction.

2. Shared Renewables – Due to building and property attributes and ownership issues, many customers are unable to install renewable energy technologies. 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. Part of Assembly Bill 3723, signed by Governor Murphy in May of this year, requires the BPU to adopt rules and regulations for a "Community Solar Energy Pilot Program." To increase program participation, the state might consider expanding virtual net metering policy to the residential sector. Virtual net metering allows a customer to receive credits from a shared system as if the generation were on site. Virtual net metering is different from a power purchase agreement (PPA), which pays the customer for the proportion of power they produce. Because it is treated as a credit on the customer's bill, the customer can avoid the tax implications of a PPA payment - which can adversely affect the economics of the system (and may come as a surprise to the participant).

   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 encouraged 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 low-income customers. States that have a shared renewable program may want to coordinate this program with implementation of the federal Weatherization Assistance Program to provide recipients of assistance with participation in a shared renewable system.

   There are several additional policy options that New Jersey might consider to promote renewable energy uptake by low- and moderate-income consumers. Generally, successful state policies should be tailored to these customers, be cost-effective and financially sustainable, have measurable performance indicators, and be flexible enough to allow later changes in design.

3. Corporate Procurement – Many Fortune 100 and 500 companies have established either climate goals or commitments to purchase renewable energy. In just the last four years, over nine gigawatts (GW) of renewable contracts have been announced by corporate entities. In the first quarter of 2018 alone, corporations signed 14 agreements for over 1700 MW of renewable energy. This is leading policymakers to provide additional avenues for businesses to procure renewable energy. New Jersey is in the top three states according to Clean Edge's Corporate Clean Energy Procurement Index. This high score is due to the state's extensive onsite solar procurement of 225.6 MW, only 60 MW behind the nation's leader, California. The state'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, onsite Power Purchase Agreements (PPAs), and develop or lease onsite renewable energy projects. New Jersey 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. States might see an emissions or clean peak standard as the next step in a progression from renewable portfolio standards (RPSs). New Jersey is currently on track to meet the greenhouse gas emission targets set by Assembly Bill 3301 in 2007. This goal requires emissions to be at 1990 levels by 2020 and 80% below 2006 levels by 2050. One of the advantages of a market-based program is that it is designed to reduce emissions in the most economically efficient manner possible. Such a standard can also address other concerns such as

environmental justice or water use. While New Jersey has already met its 2020 goal, research shows that significant new policies and enhanced strategies will be necessary to meet the 2050 goal.

To increase utility adoption of clean energy technologies, New Jersey policymakers might also consider developing a Clean Peak Standard. 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.

ELECTRIFICATION OF THE TRANSPORTATION SECTOR

An estimated 55% of new car sales 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. Another important barrier to increased adoption of EVs is their higher up-front cost as compared to similar conventionally fueled vehicles. The good news is that both supportive policies for developing charging infrastructure and technological advancements have eased "range anxiety." See the U.S. Department of Energy's Alternative Fuels Data Center for a map of refueling locations for EVs and other alternative fuel vehicles.

Over 35 bills were already introduced in the New Jersey legislature this session addressing transportation.[3] 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 to promote the purchase of an EV. Some of these include a zero emissions vehicle tax exemption, high occupancy vehicle lane exemption and discount, an EV toll discount, and utility-offered EV rebates. Furthermore, the New Jersey Department of Environmental Protection and New Jersey BPU provide grants for workplace charging stations and PSEG provides free Electric Vehicle Supply Equipment (EVSE) to companies for workplace charging. 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. For the most part, EVs are cars used for commuting and local trips. Furthermore, while a driver of a conventional vehicle stops only briefly at a gas station for the specific purpose of filling up, a driver of an EV is generally looking to refuel when they are parked for a longer period of time, for example when going shopping, going to a restaurant, or going to work. Charging infrastructure plans should target these types of locations and attempt to pair the appropriate level of charging infrastructure with a reasonable amount of time a person will be at that location. Legislation could direct a state agency to develop such a plan through a stakeholder process.

   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) of Northeast and Mid-Atlantic States. The state has also deployed a program called ChargEVC to identify high impact EV market development strategies.

2. Parking Infrastructure Requirements – In tandem with the development of a statewide plan, legislation could set requirements for EV parking 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

[3] These 35 bills include companion bills from both the Assembly and Senate.

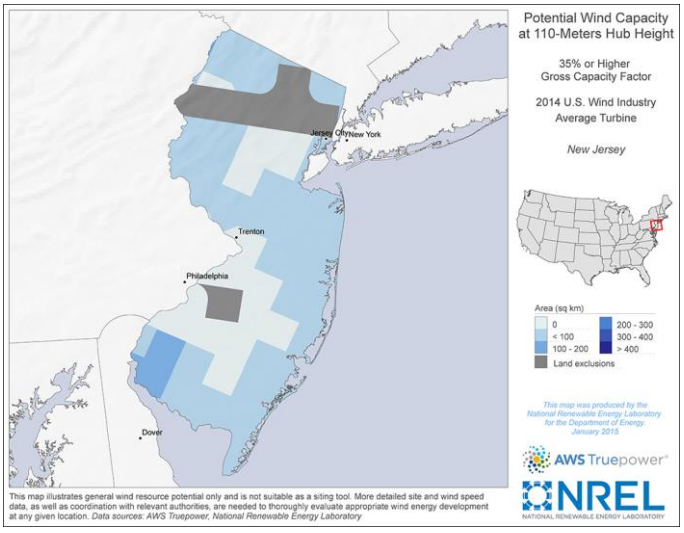
point where a utility or third-party developer might install an EV charging station. New Jersey's statewide building energy code could also be updated to include requirements for EV charging infrastructure.

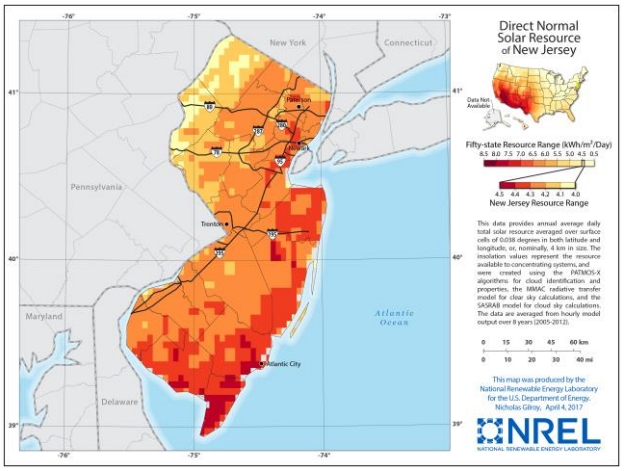
NEWS

- July 18, 2018: It Once Was a Superfund Site, Now It's a Solar Farm
- July 17, 2018: NJ Energy: 40K Solar Panels Unveiled at Former South Brunswick Superfund Site
- July 11, 2018: Energy Official Threatens New Jersey Brexit from PJM Regional Power Grid
- July 6, 2018: N.J. Regulator Threatens to Pull Out of PJM Power Market
- June 18, 2018: New Jersey is Now the United States' Hottest Clean Energy Economy
- June 13, 2018: Microgrids Benefit from New Jersey's Push for More Renewables and Energy Storage
- May 29, 2018: N.J. Sets 'Aggressive' 2 GW Storage Target by 2030

NEW JERSEY'S WIND AND SOLAR RESOURCES

WIND https://windexchange.energy.gov/states/nj[4]
SOLAR https://www.nrel.gov/gis/solar.html





OTHER RESOURCES

- Drive Green New Jersey: http://www.drivegreen.nj.gov/
- New Jersey Board of Public Utilities: http://www.state.nj.us/bpu/index.shtml
- New Jersey Clean Energy: http://www.njcleanenergy.com/
- American Wind Energy Association (AWEA), New Jersey: http://awea.files.cms-plus.com/FileDownloads/pdfs/New%20Jersey.pdf
- The American Council for an Energy-Efficient Economy State and Local Policy Database, New Jersey: http://database.aceee.org/state/new-jersey
- The Database of State Incentives for Renewables and Efficiency, New Jersey: http://programs.dsireusa.org/system/program?fromSir=0&state=NJ
- U.S. Energy Information Administration, New Jersey: https://www.eia.gov/state/?sid=NJ
- National Renewable Energy Laboratory Biomass Maps: https://www.nrel.gov/gis/biomass.html
- U.S. Department of Energy's Alternative Fuels Data Center, New Jersey: https://www.afdc.energy.gov/states/nj
- SPOT for Clean Energy, New Jersey: https://spotforcleanenergy.org/state/new-jersey/
- The Rocky Mountain Institute: From Gas to Grid – Building Charging Infrastructure to Power Electric Vehicle Demand

[4] Please see your packet for a higher resolution wind energy capacity map.

- The GridWise Alliance, Inc., EVs - Driving Adoption, Capturing Benefits: http://gridwise.org/evs-driving-adoption-capturing-benefits/
- The Regulatory Assistance Project, Performance-Based Regulation: https://www.raponline.org/event/performance-based-regulation-the-power-of-outcomes-part-1/

Our Resources

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

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

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

Clean Energy Policy Guide for State Legislatures: http://cnee.colostate.edu/cleanenergypolicyguide/

The Energy Policy Podcast: http://energypodcast.colostate.edu/

CNEE Contact Information

Tom Plant, Senior Policy Advisor
Tom.Plant@colostate.edu