

State Brief: Connecticut

Background

Connecticut's energy mix is dominated by nuclear and natural gas. In 2015, renewable resources contributed nearly 3% to the state's energy mix. By 2016, nearly 327 megawatts (MW) of distributed- and utility-scale solar photovoltaic generation was online in the state. The last coal-fired generating unit in the state, at Bridgeport Harbor Station, is [scheduled to close in 2021](#). Connecticut is second only to Massachusetts among the New England States in [committing demand response resources](#) to New England's grid.

During the 2017 Legislative session, Connecticut made national headlines with the introduction of [Senate Bill 106](#).

The legislation would have provided zero emission credits for purchases of energy from Dominion's 2088 MW Millstone Nuclear Power Station. While the bill originally failed, arguments from [Dominion motivated the Senate to revive and amend the bill](#). The bill came on the heels of similar measures in [New York](#) and [Illinois](#), which provide financial assistance to nuclear plants based on their zero emission baseload capabilities. At the end of the regular session, SB 106 had been tabled.

The three members of the bipartisan [Connecticut Public Utilities Regulatory Authority \(PURA\)](#) are appointed by the Governor. Democrats control the House and the Governor's Office. The Senate is evenly split. Connecticut is a member of the [Regional Greenhouse Gas Initiative \(RGGI\)](#).

Policy Strengths and Opportunities¹

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

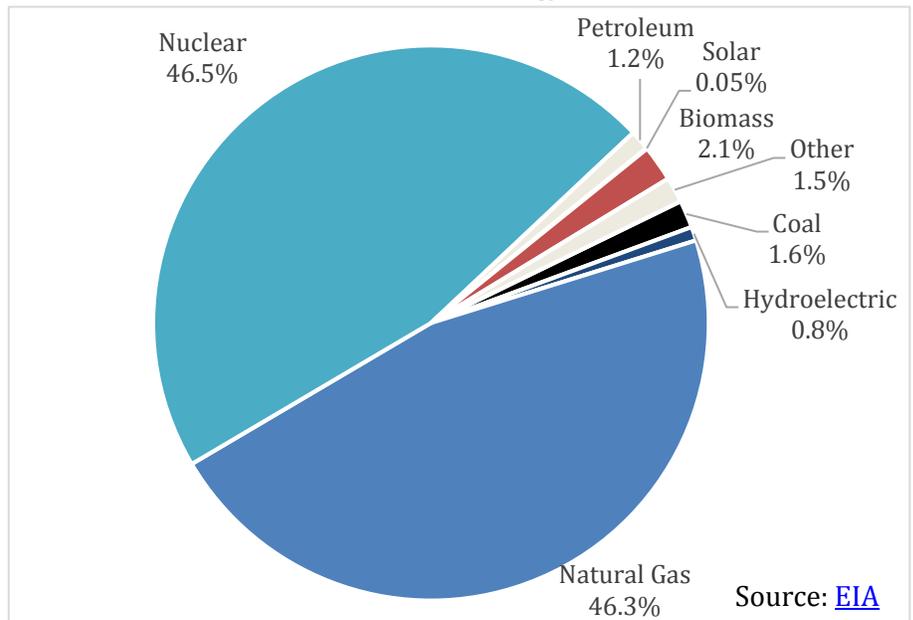
In theory, but not always in practice, clean energy policies can be categorized into one of three tiers of the policy stack. Tier 1, Market Preparation Policies, remove technical, legal, regulatory, and infrastructure-related barriers to clean energy technology adoption. Tier 2, Market Creation Policies, 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.

A simple 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>.

Connecticut's Energy Mix



customers who opt to add CHP. In this example, policies to address interconnection and stand-by rates should be adopted before financial incentive programs are implemented.

Grid Modernization

In the last two decades, digital technologies have been developed that enable utilities to better manage the grid and also 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. This can make the operational side of the utility more efficient. 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. Grid modernization will be associated with greater consumer choice, allowing customers to meet their energy priorities by producing their own energy or to selecting to receive innovative energy efficient or clean energy services from different providers.

Grid modernization efforts compliment other policies such as demand response policies, customer data management, smart metering infrastructure, electric vehicles, and others. Policy approaches around grid modernization should be seen as an umbrella to put in place a structure that supports and ties together these other individual policy initiatives.

In the June 2015 Special Session, Governor Malloy signed [Public Act 15-5](#). Section 103 of the Act mandates that every electric distribution company must submit a proposal to the Department of Energy and Environmental Protection that contains projects to build, own, or operate grid-side system enhancements, including energy storage. The [Comprehensive Energy Strategy for Connecticut](#) also addresses grid modernization. However, in terms of state efforts to modernize the grid, Connecticut has not received high marks. In the latest [Grid Modernization Index](#), the state comes in at 31st overall for state support, customer engagement, and grid operations. While Connecticut moved up in terms of state support, its ranking went down significantly for customer engagement, and also fell for grid operations. There are policy opportunities to advance in-state grid modernization efforts.

1. Update the state's energy and / or grid modernization strategy through a stakeholder process that incorporates the viewpoints of utility customers, utilities regulators, utilities, and other stakeholders. Grid modernization strategies, while recognizing regional and inter-state diversity and avoiding one-size-fits-all plans, should also take a holistic view of the electric system.
2. States may decide to mandate a ten-year grid modernization plan to be proposed by utilities to the utility commission within a specified timeframe. This mandate would include requirements for implementation by utilities within a certain amount of time. Require that plans outline a clear set of grid modernization goals and describe methods to measure, report, verify, and enforce progress towards those goals. In addition to this, states might provide incentives or cost recovery mechanisms for utilities to meet grid modernization goals.
3. Require that utilities develop and submit plans to PURA to increase the deployment of advanced metering infrastructure, and that these plans outline steps to measure and report on the results of these efforts. Consider providing incentives or cost recovery mechanisms for utilities to these goals.
4. The technologies associated with grid modernization generate a wealth of information about the grid itself and about customer behavior. State policy should include measures to protect this data, but should also encourage the use of this information to facilitate additional improvements to grid management and customer services.
5. Improve the state's energy storage policies. The adoption of incentives for or a mandate to integrate a certain amount of energy storage on the grid (see below) would enhance modernization efforts. Enhancing clean

energy financing and electric vehicle policies (see below), also improves the chances of successful grid modernization.

Energy Storage

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

Storage provides multiple benefits to both the customer and the utility. State planning and regulatory policies can help maximize these benefits through a combination of 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.

While the [Connecticut Green Bank has programs](#) to help individuals and businesses implement energy storage technologies, there are opportunities for developing supportive state policies:

1. Consider adding a procurement target or requirement for energy storage with a documented process for periodic review of progress towards that goal.
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 will be cost effective, or identify the price point at which it will be cost effective.
3. Allow utilities that provide storage incentives to customers to install smart meters that enable dynamic energy management from multiple distributed battery systems.
4. Provide an option for utility customers (targeted at commercial users) to pay an additional charge to be included in a “high reliability zone” provided through a combination of distributed generation and energy storage – forming a utility integrated “microgrid”.

Clean Energy Financing

Distributed generation (DG) provides localized generation that serves a specific part of the grid. It may include generation serving a specific residence or business, a neighborhood, or a region served by a substation. DG has the benefit of reducing stress on large transmission infrastructure by providing distribution level power (as opposed to central generation). Because small-scale renewable energy systems require large upfront investments, overcoming the upfront cost barrier is arguably the biggest challenge to clean energy deployment at the consumer level. Financing is key; and many states provide financing and financial incentives to spur adoption of these technologies.

Financing encompasses multiple potential state initiatives including green banks, credit wraps, interest rate buy downs and other common financing instruments. To promote wide-spread deployment of DG, there are a handful of policy opportunities in Connecticut.

1. Residential Property Assessed Clean Energy (PACE) – PACE is a financing mechanism used by local governments that allows property owners to finance energy efficiency and renewable energy improvements through their property tax payment. The repayment of qualified energy improvements is done via a voluntary property tax assessment collected by local governments, just as other public infrastructure investments are financed. While PACE programs can be designed for both the residential and the commercial markets, residential PACE takes a much more committed and engaged approach on the part of the state. In order to

amend Connecticut's existing residential PACE authorization, legislation might follow the Department of Housing and Urban Development's (HUD) guidance for determining eligibility for Federal Housing Authority (FHA) insured mortgage financing:

- a. Collection: The PACE obligation is collected and secured by the creditor in the same manner as a special assessment against the property;
 - b. Enforcement: The property may only become subject to an enforceable claim (i.e., a lien) that is superior to the mortgage for delinquent regularly scheduled PACE payments. The property shall not be subject to an enforceable claim superior to the mortgage for the full outstanding PACE obligation at any time;
 - c. Property Transfer: There are no terms or conditions that limit the transfer of the property to a new homeowner. Provisions to require the consent of a third-party prior to conveyance are prohibited, unless these provisions can be terminated at the option of, and with no cost to, the homeowner;
 - d. Disclosure: The existence of a PACE obligation on a property is readily apparent to all parties to an FHA-insured mortgage transaction in the public records and must show the obligation amount, the expiration date and cause of the expiration of the assessment, and in no case, can default accelerate the expiration date.
2. On-Bill Repayment or On-Bill Financing – On-Bill Repayment (OBR) and On-Bill Financing (OBF) are mechanisms for financing residential and small commercial clean energy technologies in buildings. The source of financing is the main design component separating OBR from OBF. Financing can come from the utility (OBF), or through a private entity (OBR). In either case, the customer's costs of retrofits or equipment are amortized and combined with savings from the measures on the utility bill. Legislation can tie loans together with weatherization upgrades for low-income customers.

Connecticut is one of only 12 states with implemented OBR/OBF legislation. In 2013, [Public Act 13-298](#), established a residential on-bill repayment program financed by third-party private capital. The same year, [Public Act 13-247](#) required electric and gas utilities to create three-year residential furnace and boiler replacement programs. Participating customers would repay the utility through monthly utility charges. Although Connecticut does have existing OBR policy, legislators could make the policy more comprehensive by mandating that all utilities offer on-bill financing. However, while Connecticut currently implements only OBR, utility financing is typically not as economically competitive as third-party financing and utilities often see customer financing as outside of their area of expertise. Therefore, the state may find that OBR works for the state and for ratepayers.

3. Innovative Financing Policies – This is an umbrella policy category that covers any mechanism to reduce the upfront cost of clean energy technologies for customers, and includes the following:
1. State Green Bank – At its essence, a green bank blends public and private capital to fund the upfront cost of clean energy improvements. [Connecticut's Green Bank](#) was the first in the nation and remains one of the most effective green banks in the country.
 2. Loan Loss Reserve - These funds are a credit enhancement or credit wrap in which a percentage of a program or project (for example, 10% of loan recipients or 10% of the principal) is held in reserve and only drawn in event of a default. These programs are used to leverage or reduce risk of private capital investment in clean energy projects and can support development of numerous clean energy finance tools, including on-bill financing and revolving loan funds. Connecticut has [several loan loss reserve programs](#) through the Connecticut Green Bank that residents and businesses can take advantage of.
 3. Revolving Loan Funds – The distinguishing characteristic of these public funds is that they are evergreen in the sense that the repaid principal and interest from loans made are re-issued to other loan recipients. In this way, the program funding “revolves” over time. Connecticut currently does not have any policy relating to revolving loan funds; however, [existing loan programs](#) in the state could be used in conjunction with a new revolving loan fund.
 4. Aggregate programs - These programs bundle un-securitized loans offered by private sector lenders, coupled with an interest rate buy down from a public funding source (for example, ARRA). The loans are then bundled and sold to the secondary bond market. The Warehouse of Energy Efficiency Loans ([WHEEL](#)) is a prime example of this approach. WHEEL links low cost capital from private sector lenders with state energy efficiency program implementers.

5. Securitization – Securitization, in this context, is borrowing against future ratepayer contributions into a public benefits fund. Perhaps the best example of a state securitization program is the Hawaii Green Energy Market Securitization (GEMS) program, which makes low cost capital available to a broad range of participants including renters and lower credit score borrowers. During 2014 and 2015, Connecticut’s Green Bank worked with Clean Fund to create the [first securitization of commercial PACE assets](#) in the country.

Electrification of the Transportation Sector

One of the most important barriers to increased adoption of electric vehicles (EVs) is their higher up-front cost as compared to a similar conventionally-fueled vehicle. In addition, there has been a complicated relationship between increased adoption of EVs and the availability of EV charging stations. Put simply, consumers want to be sure 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.” For instance, the most recent GM Bolt has an estimated range of 240 miles.

Connecticut is a national leader in electric vehicle infrastructure. The state is part of the [International ZEV Alliance](#), an entity dedicated to accelerating global adoption of Zero Emission Vehicles (ZEVs). In 2014, Governor Malloy, along with the governors of seven other U.S. states, released a [Multi-State Action Plan](#) to put 3.3 million ZEVs on the roads by 2025. The Connecticut Department of Energy and Environmental Protection (DEEP) offers funding to municipalities, state agencies, and private businesses for the cost and installation of eligible Electric Vehicle Supply Equipment (EVSE) through the [Public Fleet EV and Public Workplace EV Charging Station Incentive](#). Additionally, there is a reduced registration fee available for electric vehicles. The state also recently implemented the Connecticut Hydrogen and Electric Automobile Purchase Rebate (CHEAPR) program, which provides a rebate of up to \$3000 off a plug-in electric vehicle or up to \$5000 off a hydrogen fuel cell vehicle. Connecticut statute, from a bill enacted in 2016 ([HB 5510](#)), also requires utilities to integrate planning for electric vehicles into resource plans and other reports.

In 2016, the Connecticut Green Bank published a [report](#) analyzing the market potential of various types of alternative-fueled vehicles in Connecticut and concluded that the most environmentally and economically beneficial option is passenger plug-in EVs. The report indicates a desire to work with state legislators to reduce emissions from the transportation sector and to help EVs become mainstream in the state through infrastructure deployment, financial incentives, and fleet integration. While Connecticut clearly has many successful EV programs in place, there are policy opportunities to continue this leadership.

1. Building Standards and Codes – Many states and local governments are updating building standards and codes to provide guidance and standards for the installation of charging equipment. Building codes might also be updated to require either higher voltage pre-wiring or the installation of charging infrastructure.
2. Parking Infrastructure Requirements and Restrictions – Some states have adopted permitting standards for parking lots, requiring, for instance, that for every 100 parking spaces, one EV charging spot must be provided. States have also passed Anti-ICEing Legislation. “ICEing” occurs when an internal combustion engine (ICE) car is parked in an EV Only parking space. Some states have passed laws establishing penalties for non-EVs parking in EV only parking spots.
3. Rental Properties and HOAs – Legislation can also make it easier for lessees, renters, and members of a homeowners’ association (HOA) to install charging equipment. Typically, lessors are directed to allow lessees, at their own cost, to install charging systems. In some cases, lessees are required to maintain additional insurance for the system. Legislation related to HOAs typically directs Associations to avoid restrictions that would inhibit the installation of charging equipment.
4. Utility-Run Programs – Charging rate incentives and time of use rates can reduce the cost of electricity used for charging. Eligibility for a charging rate incentive may be limited to users with separate or advanced metering systems. Some utilities also offer financial incentives for the purchase of an EV charging system. In some states,

enabling legislation may be required to direct or authorize a public utilities commission to allow regulated utilities to offer and recover costs for these incentives.

2017 Energy-Related Legislation Introduced by Attendee

Bill Number	Bill Summary	Bill Status	Sponsor
SB 17-4	This bill prohibits municipal electric energy cooperatives (i.e., the Connecticut Municipal Electric Energy Cooperative (CMEEC)) from holding meetings, public hearings, strategic retreats, or similar activities outside of the state... For strategic retreats and similar activities, the bill requires CMEEC's cooperative utility board to approve, at a meeting, the retreat or activity. Existing law requires the CMEEC's cooperative utility board to include between two and six people from each member utility. The bill requires one of those representatives from each utility to be a ratepayer appointed by the municipality's legislative body, with certain restrictions. The bill requires CMEEC to (1) have a forensic audit of its books and accounts conducted annually by an independent auditing firm and post the audit's report on various websites and (2) report annually to the Energy and Technology Committee on the audit, cooperative bylaws, and employee salaries, among other things. The act also creates the position of municipal electric consumer advocate to act as an independent advocate for consumer interests in all matters affecting CMEEC's customers, including electric rates.	Enacted	Formica
SB 17-106	To provide a mechanism for baseload energy resources to sell power to electric utilities, increase the renewable portfolio standard, require electric distribution companies to solicit long-term contracts for zero emission renewable energy credits and low-emission renewable energy credits for an additional year and allow electric distribution companies to acquire new fuel cell electricity generation.	Introduced	Formica

Other 2017 Energy-Related Legislative Activity

Only bills that have passed both chambers are set out below. For all 2017 energy-related legislation, visit aeltracker.org.

Bill Number	Bill Summary	Bill Status
HB 17-5583	This bill (1) opens the angel investor tax credit program to businesses in any industry, instead of just those in specified technology industries and (2) generally restricts the amount of credits that may be awarded for investments in businesses in those technology industries.	Enacted
HB 17-6304	Creates a process through which the electric distribution company that serves Bridgeport (i.e., United Illuminating (UI)) can own and operate a combined heat and power (CHP) system that supplies thermal heat to Bridgeport's district heating company. Once the system is built, the act requires UI to deliver the following benefits generated by the system to the district heating company at no cost: (1) the total thermal energy generated by the unit; (2) all capacity payments received for the unit; and (3) any other attributes, including the environmental attributes (e.g., renewable energy credits (RECs)), associated with the electricity generated by the unit. The act also (1) allows a municipality, by vote of its legislative body, to abate all or a portion of the property tax for a property on which the CHP unit is constructed and (2) requires a study on the viability of new district heating networks in the state.	Enacted
HB 17-7036	Makes several changes to various clean and renewable energy initiatives.	Enacted
HB 17-7104	To no longer permit suppliers and electric distribution companies to make up	Enacted

	renewable energy portfolio deficiencies within the first three months of the succeeding calendar year.	
HB 17-7208	Makes several changes to the Connecticut Green Bank's Commercial Property Assessed Clean Energy Program (C-PACE). The bill expands the purposes for which C-PACE financing may be provided; allows participating third-party capital providers to provide leases and power purchase agreements; specifies that foreclosures on the liens are limited to late assessment payments and that liens for payments that will become due in the future survive the foreclosure; and specifies that when a property with a benefit assessment lien is subject to a property tax foreclosure or levy and sale, the lien for any late payments will be extinguished but the lien for payments due in the future will remain with the property.	Enacted
SB 17-76	Concerning a mileage tax study.	Enacted
SB 17-260	Studying autonomous vehicles.	Enacted
SB 17-1058	To require the CTNext board of directors to issue a request for proposals to enter into an agreement with a private research organization to advise, guide and assist the state in short-term and long-term strategic economic planning.	Enacted
SB 17-1051	Concerning CTNext planning grants-in-aid and innovation place designation applications, invest CT Fund tax credit transferability and state investments with venture capital firms.	Enacted
SB 17-899	To no longer require the Public Utilities Regulatory Authority to hold a hearing for certain adjustments, unless a hearing is requested by a company, interested person or member of the public.	Enacted
SB 17-900	Concerning minor revisions to electric supplier compliance requirements regarding environmental laws, renewable portfolio standards, and advertising and contract provisions and PURA's reporting of electric rates.	Enacted
SB 17-943	Concerning the installation of certain solar facilities on productive farmlands.	Enacted
SB 17-966	Concerning economic development programs administered by the Department of Economic and Community Development.	Enacted

News

- August 31st, 2017: [Dominion: State's Own Energy Strategy Shows Importance of Millstone.](#)
- August 30th, 2017: [Heating Oil Providers Concerned about Connecticut's Future Energy Use.](#)
- August 23rd, 2017: [Connecticut Utilities Drop Interest Rates on Energy Efficiency Improvements.](#)
- August 23rd, 2017: [9 Eastern States Agree to Cut Power Plant Emissions an Extra 30%.](#)
- August 5th, 2017: [Connecticut to Issue Grants for Microgrid Energy Projects.](#)
- August 2nd, 2017: [Connecticut Energy, Climate Change Goals open to Public Comment.](#)
- July 28th, 2017: [Connecticut's Energy Strategy Focuses on Renewables, Grid Modernization.](#)
- July 26th, 2017: [A Look at Connecticut's 2017 Comprehensive Energy Strategy.](#)
- June 26th, 2017: [Green Farmland or Green Energy? Deepwater Wind Brings Debate to Connecticut.](#)

Other Resources

- Connecticut Farm Energy Program: <http://www.ctfarmenergy.org/>
- Connecticut Green Bank: <http://www.ctgreenbank.com/>
- Connecticut Public Utilities Regulatory Authority: <http://www.ct.gov/pura/site/default.asp>
- Connecticut Zero Energy Challenge: <https://www.ctzeroenergychallenge.com/index.php>
- Department of Energy and Environmental Protection: <http://www.ct.gov/deep/site/default.asp>
- Energize Connecticut: <https://www.energizect.com/>
- The American Council for an Energy-Efficient Economy State and Local Policy Database: <http://database.aceee.org/state/connecticut>
- The Database of State Incentives for Renewables and Efficiency, Connecticut: <http://programs.dsireusa.org/system/program?fromSir=0&state=CT>
- U.S. Energy Information Administration, Connecticut: <https://www.eia.gov/state/?sid=CT>
- SPOT for Clean Energy, Connecticut: <https://spotforcleanenergy.org/state/connecticut/>