

Powering the Path to a Cleaner Future



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Central Hudson
A FORTIS COMPANY





Powering the Path to a Cleaner Future

Central Hudson is committed to a cleaner energy future by supporting New York state's energy policies and its Reforming the Energy Vision (REV) goals — reshaping the state's energy landscape toward a more-distributed, less-carbon intensive system. Central Hudson strongly believes that maintaining affordability must be a part of the solution.

New York state has set forth some of the boldest clean energy policies in the nation with the goal of reducing carbon emissions and addressing climate change. The state's REV initiative includes increasing the amount of distributed energy resources such as wind, solar and battery storage, plus energy efficiency, as foundational elements of this vision. In July 2019, under Gov. Andrew Cuomo's leadership, New York enacted nation-leading clean energy goals, including achieving 70 percent of all electric generation produced by renewable resources by 2030, and that the electric generating sector be carbon neutral by 2040.

However, eliminating all fossil fuel use in the electric generating sector will not be sufficient to meet the state's carbon reduction goals. In fact, if all electricity generated from fossil fuels were eliminated today, the state would achieve only a 24-percent carbon reduction, far short of the 40-percent statewide target. To that end, Central Hudson has identified five key strategies that will provide a path toward achieving the state's emission reduction goals while maintaining reliability and affordability for our customers.

Central Hudson is committed to making investments in infrastructure and technology that cost effectively reduce carbon emissions while continuing to provide reliable, resilient and affordable power by:

- 1) Upgrading electric transmission and distribution lines
- 2) Pursuing the lowest cost approach to emission reduction
- 3) Integrating natural gas benefits
- 4) Expanding energy efficiency programs
- 5) Advancing environmentally beneficial electrification

New York's Green New Deal Goals



Electric generation from renewable energy sources by 2030



Electric generation of electricity from zero-emission sources by 2040



Reduction in **greenhouse gas emissions** by 2030



Reduction in **greenhouse gas emissions** by 2050



6,000 MW of solar by 2025



3,000 MW of storage by 2030



9,000 MW of off-shore wind by 2035

The bill sets greenhouse gas emissions baseline as 1990 emissions.



1) Upgrading electric transmission and distribution lines

As energy resources become more locally distributed, the transmission and distribution grid, which enables this transformation, becomes increasingly important and more complex to operate.

Upgrading transmission and distribution line capability and deploying new technologies will enable wide-spread electrification of New York's economy.

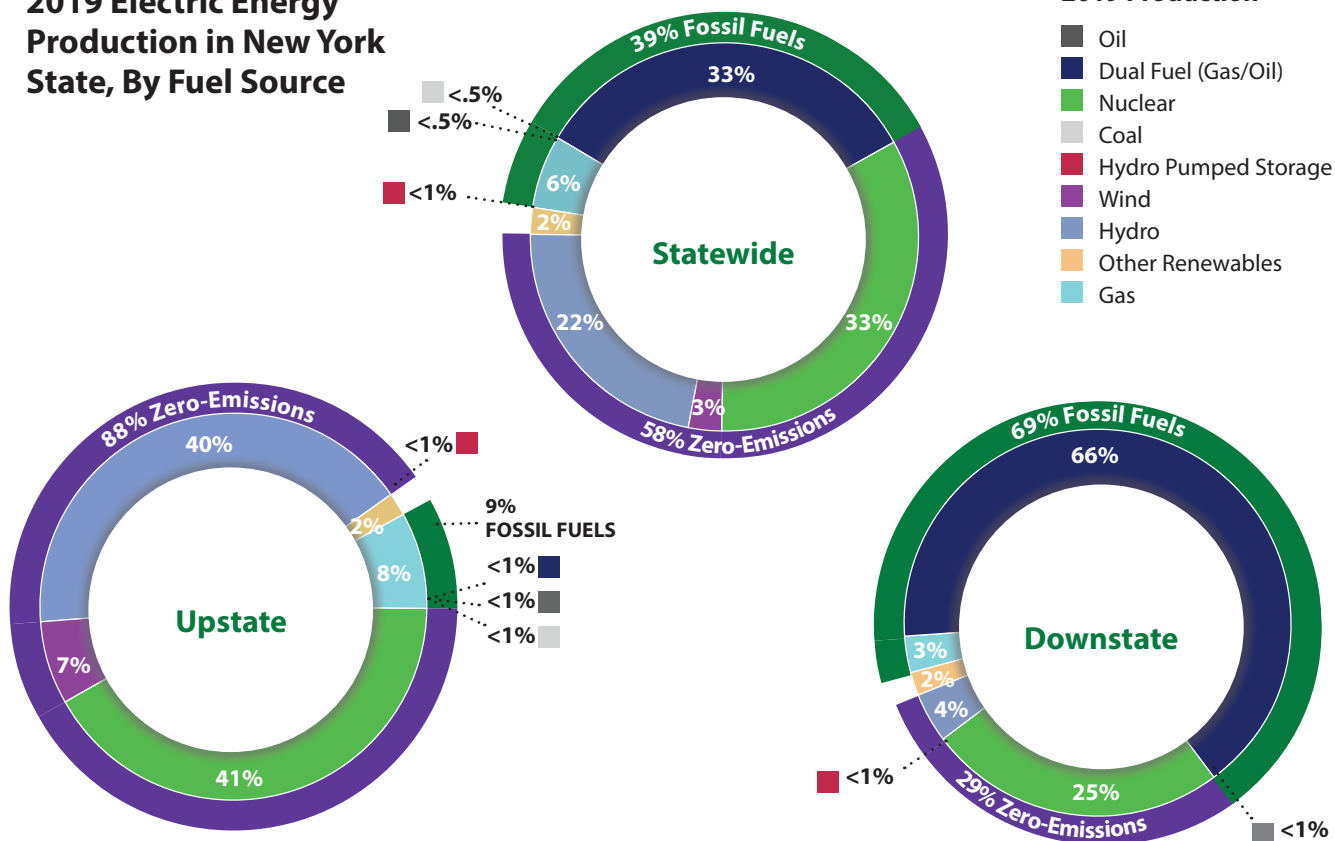
Transmission

Major hydropower resources and all existing wind power facilities are located in northern and western areas of the state — hundreds of miles from the high demand regions of southeastern New York. Transmission enhancements and expansion will make more effective use of these resources.

Additional high voltage transmission will deliver power from upstate regions to downstate. Transmission can be thought of as an extension cord that delivers energy available from the northern and western parts of the

The electricity required to power our economy and meet these ambitious goals will come only from zero or low-greenhouse gas emitting sources.

2019 Electric Energy Production in New York State, By Fuel Source



Source: NYISO Power Trends 2020



state — where 90 percent of power is generated from zero-emission sources including wind, solar, nuclear and hydro power — to the downstate regions. Transmission capacity constraints affect the ability to move power from cleaner upstate resources to

downstate demand centers. Currently, lower New York uses more energy than it produces (see chart, right) and this imbalance creates additional costs for customers, often referred to as congestion or capacity costs. Since 2014, Central Hudson customers have paid \$273 million in incremental energy congestion costs. In 2018, this added an additional \$100 per year to a residential customer’s bill. Transmission enhancements help alleviate these higher energy production costs.

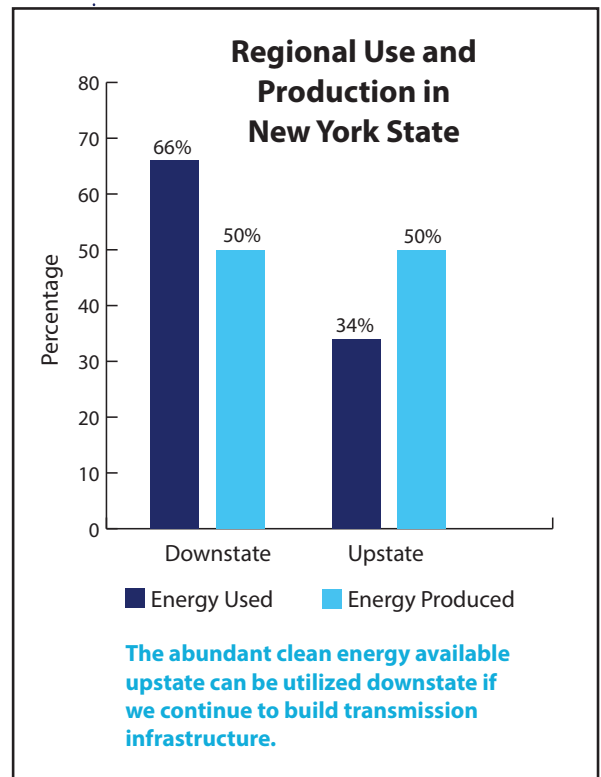
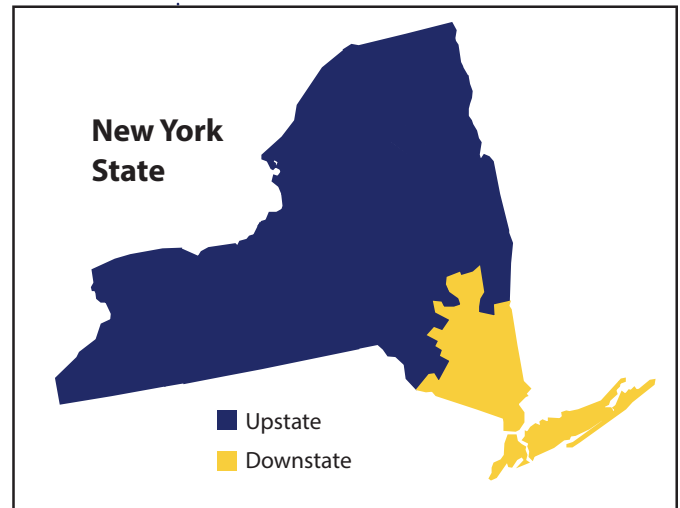
The New York Independent System Operator (NYISO) recently approved a transmission rebuild project to enable the abundant sources of clean energy generated upstate to be delivered to the southern portion of New York state where energy demand is highest. The project upgrades transmission lines within existing corridors from New Scotland to Pleasant Valley and from Edic to Albany. Looking ahead, a coordinated plan seeking the most cost-effective methods to achieve public policy goals must include additional transmission needs to deliver these resources.

“Absent investment to expand the transfer capability of the bulk power system, investment in renewables in upstate load zones runs the risk of bringing diminishing returns in terms of progress toward both renewable energy production and carbon dioxide emissions reduction goals. This is because nearly 90 percent of the energy produced upstate already is derived from carbon-free resources. Because load in the upstate region is not projected to grow, the addition of new renewable resources increasingly displaces other sources of clean generation instead of allowing more renewable resource to reach customers.”

— NYISO Power Trends 2019

Distribution

The long-term carbon emission target will require the elimination of nearly all fossil fuel consumption across the entire New York state economy, affecting the way we heat our homes and buildings, as well as ground-based transportation (both passenger vehicles and mass transit). The electricity required to power our economy and meet these ambitious goals will need to come only from zero- or low-greenhouse gas emitting sources such as renewable energy, natural gas and nuclear power. This widespread electrification of nearly every energy end-use sector will lead to a





dramatic reshaping of the electric power system for New York, and will require a significant increase in power generating capabilities, together with the distribution system and substation upgrades to meet higher demands for energy.

Modernization investments in Central Hudson’s electric distribution system will improve reliability, resiliency and efficiency while enabling the integration of various types of distributed energy resources. Central Hudson, through its smart grid strategy, is taking significant steps to accommodate distributed energy resources, while ensuring that system safety and reliability are preserved. Critical to these efforts are a set of foundational investments including:

- **Distribution Automation (DA)** — intelligent field devices and distribution infrastructure
- **Distribution Management System (DMS)** — centralized distribution control system
- **Network Communications Strategy** — two-way communication system between the DA devices and DMS

2) Pursuing the lowest cost approach to emission reduction

According to NYISO, to achieve 50 percent of electric generation from renewable energy sources by 2030 requires 75,000 GW-hours of total renewable energy. This would require increasing energy from renewables by 33,700 GW-hours, or the equivalent of serving 4.5 million homes, from current levels. NYISO estimates that the additional renewable energy would require carbon-free generating capacity additions approximately equivalent to 25,000 MW of solar photovoltaics, or 15,000 MW of wind turbines, or 4,000 MW of hydro power. Due to the intermittent nature of renewable resources, 1 MW from wind or solar resources can power 100-400 homes, while 1 MW of conventional generation can power about 800 homes.

Providing a mix of resources at the least cost to consumers requires policymakers to consider how capable — or incapable — intermittent resources are at reliably supplying power demands.

Within Central Hudson’s service territory, energy efficiency programs offer the most cost-effective way to reduce energy use, with an annualized cost of approximately \$0.01-\$0.02 per kWh. Large-scale renewables (more than 5 MW) cost \$0.06 per kWh, while rooftop and distributed (community) solar (5 MW or less) cost approximately \$0.14 per kWh while producing only 2 percent of New York state’s energy supply.

New York state policy requires utilities to compensate residential and small commercial solar customers based on net energy metering, which credits energy production at full-service rates. This was an effective way to initially

New York State’s “50 by 30” Target Needs



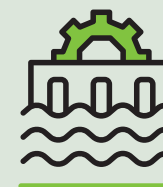
25,000 MW of solar power;
requires 125,000 acres or
200 square miles of land
(Source: NYISO)

or



15,000 MW of wind power;
requires 1,275,000 acres of land
(Source: US DOE 2015 Wind Vision report; 85 acres per 1 MW)

or

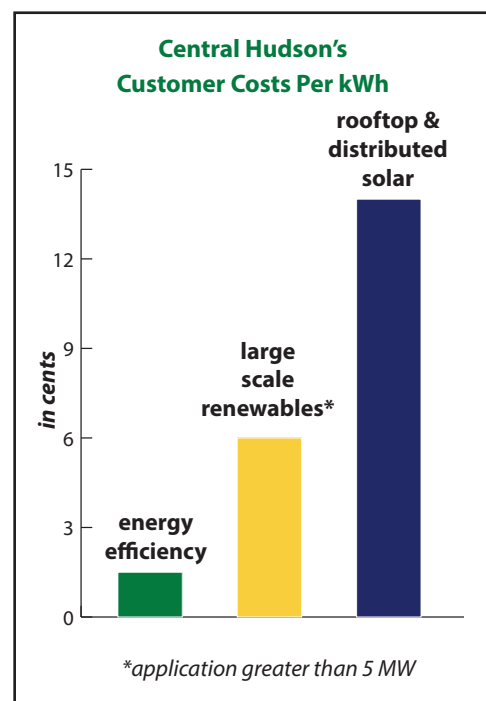


4,000 MW of hydro power;
requires building two
new facilities the size of the
Niagara Power Project
(Source NYPA;
Niagara Power Project is 2,600 MW)

advance the solar market because it provided a generous subsidy to solar customers and developers for the electricity produced. However, it also allowed them to avoid paying for their use of the grid, which is necessary for the technology to deliver its benefits. As cited by New York State Public Service Commission in Case 15-E-0751 and economists, this approach vastly overcompensates solar energy for the value it provides to the grid, our environment and the economy.

Taxpayers and utility customers currently subsidize solar participants through a combination of NYSERDA incentives, net energy metering, and state and federal tax incentives. That is concerning for several reasons:

- a) Less money is available for other effective carbon-reduction policies;
- b) It favors certain technologies rather than allowing market innovation to identify the most efficient and effective way to reach the goals;
- c) Upstate solar installations are often displacing other carbon-free sources because nearly 90 percent of the energy produced upstate is already carbon free and demand for energy in that area is not projected to grow;
- d) It creates economic fairness issues among all other customers, as solar customers do not pay their share of the costs to utilize the grid. Solar customers, too, use the grid every day yet avoid paying for this service, all while being compensated in excess of the value the resource provides to the grid. Solar does not replace the need for traditional generation; and
- e) Rooftop solar participation is highly skewed toward more affluent residents with adequate financial resources to install solar, creating economic justice issues. New York state has made progress in addressing this by establishing Community Distributed Generation, which allows all customers to participate. However, the economic justice issues caused by rooftop solar will continue for as long as the current compensation policy exists.



Central Hudson proposes utility ownership of large scale renewable energy production

Central Hudson believes that renewable energy resources should be developed at the least cost. A market-based, technology-neutral approach would be the most effective way to achieve this goal. However, the current approach is not market based and does not achieve this goal, as private developers who build and own renewable resources do not bear sufficient risk because they are provided with subsidies collected from all customers through utility bills.

If the market-based approach does not achieve the desired outcome — either from insufficient resources being developed or costs well above forecast — then utility

ownership would be a better solution. In this scenario, utility ownership of renewables would result in lower total costs to customers due to the utilities' lower cost of capital. Customer dollars could be utilized more effectively, and the residual value of the renewable assets would also be retained for the benefit of customers. Ownership by utilities also allows for closer regulation by the Public Service Commission, providing additional protections for customers. Because utilities have an obligation to provide reliable service, they would be committed to making repairs to facilities affected by a catastrophic event. This model has been successfully utilized in other regulatory jurisdictions.

The Costs of New York’s Clean Energy Programs

New York utility customers are financially supporting the state’s energy goals. Currently the state has committed \$20.6 billion toward meeting these goals through 2025. In 2018, Central Hudson customers contributed \$54.8M or 12.5 percent of the average residential bill to support New York state’s clean energy initiatives:

- **Clean Energy Standard:** Requires utilities to procure electricity from clean energy sources at an additional cost to New York utility customers.
 - » **Zero Emissions Credits (ZECs):** Financially support and subsidize upstate nuclear power plants. Intended to keep these plants open until 2029 and provide an emissions-free bridge to renewable energy.
 - » **Renewable Energy Credits (RECs):** Subsidies for wind and solar. Issued when one megawatt-hour (MWh) of electricity is generated and delivered to the electricity grid from a renewable energy resource.
- **Offshore Wind:** In 2016 the state proposed the development of 2,400 MW of electricity from offshore wind. The New York State Public Service Commission estimates that the 2,400 MW will cost customers \$8 billion through 2030, however this does not factor in the costs to build the transmission infrastructure needed to move the power onshore. In 2019, as part of the Governor’s Green New Deal, the state increased the target to 9,000 MW in order to meet the energy needs of New York City and Long Island.
- **Clean Energy Fund:** Designed to accelerate the use of clean energy and energy innovation.
 - » **NY-Sun:** Funding provided to residential and commercial customers to support an expanding solar industry.
 - » **NY Green Bank:** Fund investments in clean energy technologies and projects. Goal: Create a more efficient, reliable and sustainable energy system.
 - » **Energy Storage:** Meeting a goal of 3,000 MW of energy storage by 2030 to reduce reliance on the power grid during peak demand periods making it possible for buildings such as critical facilities to continue to operate during a power outage.
- **Energy Efficiency:** New York state aims to achieve 15.6 billion kWh of energy savings through NYSERDA and utility administered programs from 2019–2025 for efficient lighting, heating and cooling.
- **Net Metering:** Provides customer funded utility credits to rooftop solar customers.
- **Community Distributed Generation:** A shared renewables program allowing customers who cannot site solar, small wind, or other distributed generation on their own property to participate directly in off-site projects through remote net metering.

New York State Clean Energy Initiatives: Costs to Electric Customers 2006-2025

Program	State	Central Hudson
Zero Emissions Credits	\$5,013,087,000	\$92,759,000
Renewable Energy Credits	\$1,362,882,000	\$25,476,000
System Benefits Charge*	\$1,220,718,000	\$48,984,000
Renewable Portfolio Standard*	\$1,540,669,000	\$79,622,000
Energy Efficiency Portfolio*	\$1,979,636,000	\$102,813,000
Clean Energy Fund	\$3,404,506,000	\$185,486,000
NY-Sun	\$943,773,000	\$51,419,000
NY Green Bank	\$742,190,000	\$40,436,000
Utility Energy Efficiency	\$3,887,423,000	\$124,975,000
Net Metering	\$1,038,851,000	\$101,500,000
Community Distributed Generation	\$410,858,000	\$56,892,000
Offshore Wind	pending	pending
Energy Storage	pending	pending
Total	\$21,544,593,000	\$910,362,000

* Previously authorized amounts for these programs for years 2016 and forward were reallocated to the Clean Energy Fund, NY-Sun and NY Green Bank with the establishment of the Clean Energy Fund Framework in January 2016.



3) Integrating natural gas benefits

New York's existing natural gas system complements the electric system and must be part of the solution for a cleaner environment.

As aging, older, less-efficient conventional generation sources are replaced, new, highly efficient plants using reliable, domestic and affordable natural gas must be a part of the energy mix.

Natural gas is a bridge to a cleaner environment

According to the Brookings Institute, to date, natural gas plants have reduced emissions 2.6 times more than that of wind and four times more than that of solar. Natural gas is easily the least expensive path to a low-carbon energy system.

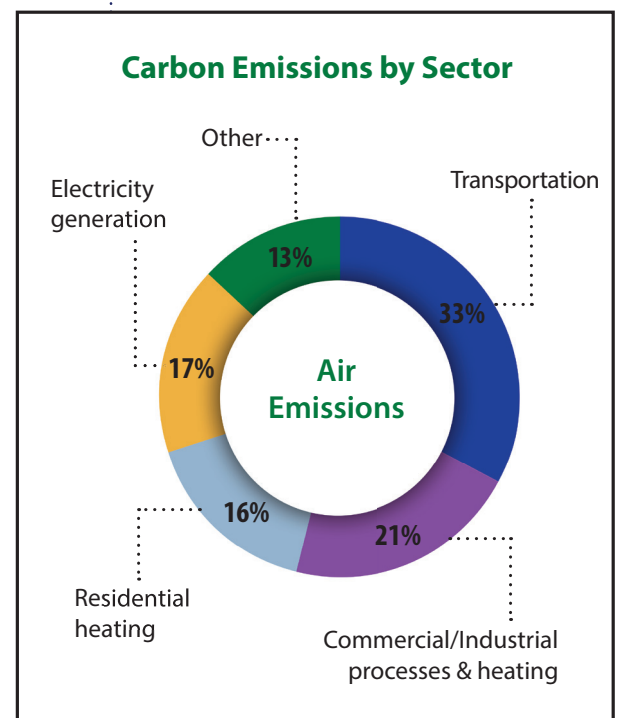
Source: www.brookings.edu/wp-content/uploads/2016/06/Net-Benefits-Final.pdf

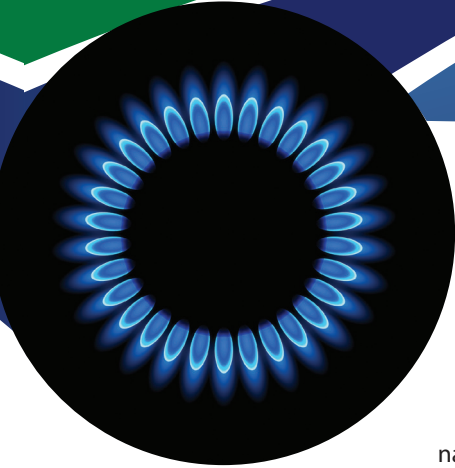
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Emissions from buildings must also be addressed. As shown in the Carbon Emissions by Sector graph, right, residential and commercial heating is responsible for 37 percent of all carbon emissions in the state. Central Hudson supports two solutions to reduce these emissions:

a) Expand the use of natural gas for heating.

According to the New York State Public Service Commission Case 12-G-0297, 580,000, or 33 percent of households in New York are located within an existing natural gas franchise area. Per unit of energy, natural gas emits approximately 28-percent less carbon dioxide than petroleum-derived fuels and has significantly lower levels of nitrogen oxides (NOx), sulfur dioxide (SO₂) and particulate matter; therefore, using natural gas to displace oil and coal consumption will result in lower overall emissions. Within Central Hudson's service territory, only 34 percent of residential customers heat their homes or businesses with natural gas or electricity. The remaining customers predominantly utilize carbon-intensive resources such as fuel oil or propane for their heating needs. Currently, approximately 6,800 homes within Central Hudson's service area are located along natural gas mains but use fuel oil or propane for heating.





b) Support renewable energy resources by pursuing natural gas generation.

On the generation side, natural gas is a complement to intermittent renewables, such as wind and solar, because of the flexible, resilient, quick-start capability of natural gas generators. In addition, the use of natural gas as power for non-emitting sources, such as fuel cells, would have the benefit of adding resource diversity and resiliency to the state's energy mix.

Solar and wind generation have limited availability because the sun is not always shining and wind is unpredictable. In New York state, solar produces very little energy in the winter months. In fact, between December and February, solar produces energy during 8 percent of the hours, on average. This increases the need for natural gas and nuclear resources. Furthermore, for the foreseeable future, solar and wind energy cannot cost-effectively be stored for later use.

Solar does not replace the need for generation such as natural gas and nuclear power plants, which are available nearly 100 percent of the time. Since solar is intermittent and limited when electric usage peaks, it becomes incremental to existing generation sources.

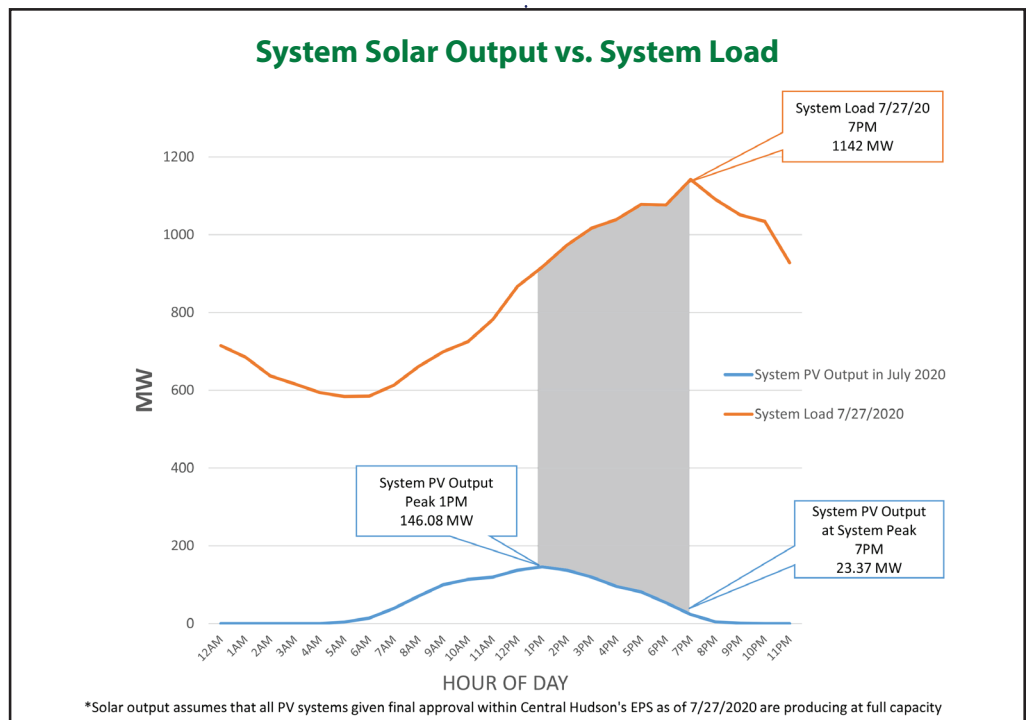
Even when solar production is at its highest, it provides limited benefit because solar's peak output does not coincide with customers' peak demand. As the chart to the right shows, solar output peaks at 1 p.m. while Central Hudson's load peaks at 7 p.m. Other resources must fill the gap.

By contrast, natural gas generators are ready on demand to provide energy as needed, during times when renewable resources are unable to produce electricity.

Natural Gas Carbon Footprint

The average natural gas customer's carbon footprint has been reduced by half since 1970 thanks to advances in energy efficiency for buildings and appliances, consumer conservation and the impact of utility energy efficiency programs.

Source: *aga.org*





The electric generating sector has made significant progress toward reducing emissions and providing lower-carbon power in New York. Nuclear and hydro power are carbon-free sources that comprise 50 percent of the state's generating mix. In addition, New York has virtually eliminated coal and oil from its fleet of generators. Land-based wind has been developed extensively in the state, but only makes up about 3 percent of the generating load. All other renewables, including solar, account for approximately 2 percent. See Electric Energy Production graph, right.

Nuclear has a role in a clean economy

New York policymakers have recognized the importance of maintaining the clean, always-available power generated by nuclear power plants — with no carbon emissions — by requiring utility customers to provide above-market subsidies in the form of Zero Emission Credits (ZECs) to three upstate nuclear plants: Fitzpatrick (Scriba, Oswego County), Ginna (Ontario, Wayne County) and Nine Mile Point (Scriba, Oswego County). If these nuclear power plants were to close, the state would regress significantly on its emission reduction progress and would have to rely on natural gas as the quick start fuel of choice to ensure reliability.

Through 2025 ZECs are projected to cost Central Hudson customers \$92 million.

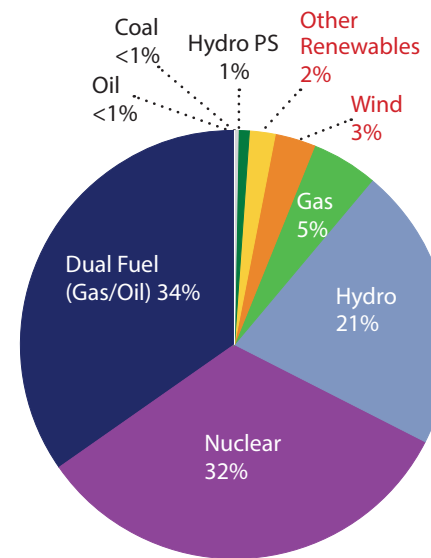
Indian Point — a 2,000 MW carbon-free nuclear plant located in Buchanan, Westchester County — provides approximately 25 percent of downstate's power requirements and does not receive these ZECs. The plant is scheduled to close by 2021 resulting in the need to fill the gap in baseload generation in order to ensure reliability.

According to NYISO, the 2,000 MW of electricity generated by Indian Point will be replaced by the following natural gas-fired combined cycle and combustion turbine generators:

- **120 MW: Bayonne Energy Center**
- **678 MW: CPV Valley Energy Center**
- **1,020 MW: Cricket Valley Energy Center**

If there is insufficient power to replace power produced by Indian Point, the NYSIO will require Indian Point to continue operating.

2018 Electric Energy Production in New York by Fuel Source



Source: NYISO

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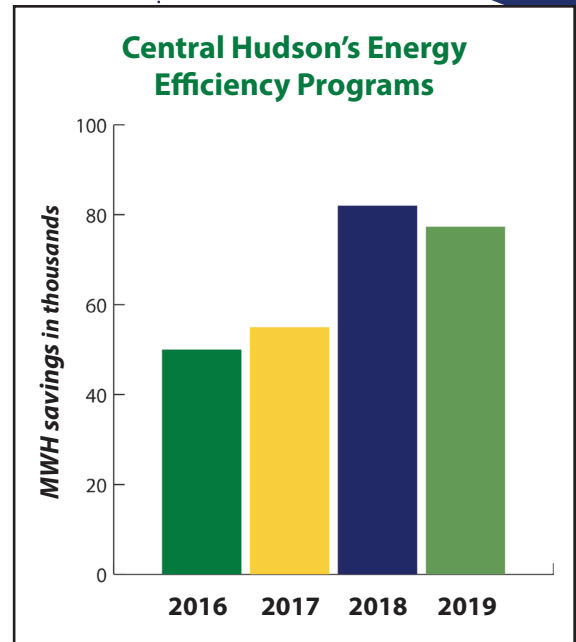
4) Expanding energy efficiency programs

New York state's goal of improving energy efficiency represents a 26-percent reduction in energy use. The annualized cost of energy efficiency is approximately \$0.01-\$0.02 per kWh, providing a low cost with high return. Central Hudson has significantly ramped up its energy efficiency programs in response to the state's energy objectives.

Central Hudson continues to expand product and service offerings and seeks greater engagement with customers through CenHub, the online portal for account management and energy-saving products, energy efficiency programs and incentives:

- Time-of-Use encourages customers to reduce their use of electricity during peak hours by shifting their usage to off-peak hours.
- More than 2 million LED light bulbs have been sold or distributed to customers through Central Hudson's lighting programs since 2016.
- Central Hudson works with municipalities to convert street lights to high efficiency LEDs.
- Supported by a network of more than 600 local plumbers and HVAC installers, Central Hudson has retrofitted more than 1,800 commercial and industrial facilities with high efficiency equipment since 2016.
- Home energy audits are offered through a partnership with Sealed's HomeAdvance program where homeowners receive a personalized home energy improvement plan.
- Central Hudson's refrigerator recycling program offers payments of \$100 for recycling older working refrigerators and freezers, making it easier for customers to upgrade to energy efficient models.

The utility's programs have saved customers more than 50,000 MWh in 2016, 54,000 MWh in 2017 and 82,000 MWh in 2018. In 2019, savings amounted to 79 MWh — equivalent to the use of electricity used by 6,445 homes. Maintaining this level of progress will become increasingly challenging as energy efficiency upgrades are completed and the available projects become more costly.



Central Hudson has significantly ramped up its energy efficiency programs in response to the state's energy objectives, however, maintaining this level of progress is increasingly challenging as energy efficiency upgrades are completed and the available projects become more costly.



5) Advancing environmentally beneficial electrification

New York’s ambitious clean energy goals will require curbing carbon emissions in the two largest emitting sectors — **transportation** and **building heating**. An environmentally beneficial electrification strategy to replace direct fossil fuel use such as gasoline, fuel oil and propane with electricity will reduce overall emissions thanks to the clean resources powering the state’s electric grid.

The power sector has made significant progress in emission reductions, and today 58 percent of the state’s overall electricity production is generated with zero emission energy resources, with 88 percent of upstate resources producing zero emissions.

There are many opportunities to adopt clean electric alternatives across the residential and commercial sectors including electrifying transportation (with electric vehicles, for example) and switching to efficient electric heating systems such as heat pumps.


Transportation

According to New York state Energy Research and Development Authority’s (NYSERDA) Greenhouse Gas Inventory, emissions from the transportation sector increased by 20 percent between 1990 and 2015 due to growth in vehicle use and miles traveled. Electrification may be the best option to reduce transportation emissions in the long term and offers numerous benefits for customers and communities, including increased energy efficiency, improved sustainability, energy security, reduced greenhouse gas emissions and lower vehicle operating costs. Central Hudson believes there are opportunities to further develop the electric vehicle market:

- **Encourage:** Central Hudson will work with municipalities to revise zoning codes to encourage electric vehicle charging infrastructure at large commercial and mixed-use development projects and urban centers.

The largest emitters of greenhouse gas emissions in New York state are from gasoline and diesel vehicles. In fact, one-third of total emissions in New York comes from the transportation sector. To this end, the New York State Public Service Commission has ordered the utilities to create electric vehicle Make-Ready programs and deploy 53,700 level 2 chargers and 1,500 DC fast chargers through 2025.

Electric Vehicle Emissions



60%-85% less than gasoline-powered vehicles

By participating in energy efficiency programs in 2019, **Central Hudson’s customers saved more than 79 million kWh**, which equate to ...

CO2 emissions from



6,445 homes’ electricity use for one year

or



129,319 barrels of oil consumed

or



6,285,154 gallons of gasoline consumed

Greenhouse gas emissions from



12,067 passenger vehicles driven for one year



- **Own:** Central Hudson calls on elected leaders and community stakeholders to support the opportunity for utility investments in electric vehicle charging when private options are not feasible. More immediate solutions are needed to meet state goals and may include fuel emission standards and public transportation policies.

Central Hudson calls on elected leaders and community stakeholders to support the opportunity for utility investments in electric vehicle charging.

Buildings

The building heating sector accounts for 37 percent of the state's carbon emissions. Where natural gas is unavailable or where the natural gas system cannot cost effectively be extended, electrifying building heat will reduce emissions. According to the 2019 NYSERDA report, *New Efficiency: New York Analysis of Residential Heat Pump Potential and Economics*, conversion from natural gas to heat pumps cannot be justified economically nor environmentally. However, as the technology improves and prices fall, heat pumps do make sense for buildings using fuel oil and propane where natural gas is unavailable.

Central Hudson has established a carbon reduction program that aims to efficiently reduce carbon emissions by encouraging customer use of environmentally beneficial electric technologies, such as air- and ground-source heat pumps. Central Hudson offers rebates and incentives for upgrading to high efficiency water heaters and heat pumps, available to residential and commercial customers.



An **air-source heat pump** can provide efficient heating and cooling and can deliver one-and-a-half to three times more heat energy to a home than the electrical energy it consumes. This is possible because a heat pump moves heat rather than converting it from a fuel, like combustion heating systems do.

(Source: Energy.gov)

Geothermal heat pumps use the earth's constant temperatures for heating and cooling. Although air temperatures above ground change throughout the day and with the seasons, temperatures of the earth 10 feet below ground are consistently between 50°F and 60°F.

For most areas of the United States, this means soil temperatures are usually warmer than the air in winter and cooler than the air in summer. Geothermal heat pumps work as stand-alone systems, transferring heat from the ground (or water) into buildings during the winter and reversing the process in the summer.

(Source: EIA.gov)



Next steps: What is Central Hudson doing?

Environmentally beneficial electrification

Central Hudson has embarked on an initiative to replace direct use of fuels such as heating oil, propane, and gasoline with electricity to reduce overall emissions and energy costs. The use of these fuels is prevalent in the Mid-Hudson Valley, offering a substantial opportunity to reduce emissions through electrification.

- **Clean heat:** Building and water heating are critical areas that must be addressed in order to meet clean energy goals. Electric HVAC and water heating systems are more efficient than systems using onsite heating oil and propane fuels, and can have a major impact on reducing greenhouse gas emissions. Central Hudson offers incentives to replace or offset existing fuel oil and propane systems with efficient electric heat pumps, including air source, ductless mini-split, ground-source and heat pump water heaters. Central Hudson has proposed a major expansion of this program to begin in 2020 which includes more than \$24 million in heat pump incentives available to residential and commercial customers — designed to achieve more than 12,000 installations by 2025. Central Hudson's five-year Clean Heat Program budget amounts to \$43 million.
- **Electric transportation:** In order to encourage the electrification of transportation, Central Hudson is engaging municipalities and fleet owners in determining the feasibility of adopting select electric cars and trucks, and has begun electrifying its fleet where it makes sense. Central Hudson has installed 60 Level 2 chargers and one DC fast charger throughout its six district locations for the utility's fleet, employee and visitor use. An EV Time-of-Use rate is offered to electric vehicle owners to encourage

off-peak charging at a reduced rate. Through 2025, Central Hudson will be providing incentives toward the installation of 3,200 level 2 chargers and 69 DC fast chargers at a cost of \$31.1 million.

Energy efficiency programs

Central Hudson offers a robust portfolio of programs and incentives to help customers reduce energy use and protect the environment. Programs are designed to drive cost-effective energy savings in both the residential and commercial sectors. Through innovative program development and successful implementation strategies, Central Hudson has consistently exceeded the electricity savings targets established by New York state regulators.

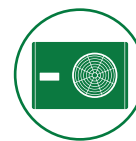
- **Residential lighting:** Central Hudson was the first utility in New York state to launch a Residential Retail Lighting Program in April 2016. This ongoing program aims to increase the penetration of efficient lighting in customers' homes by incentivizing the purchase of LED lighting at retail locations within Central Hudson's service territory. The strategic partnerships between Central Hudson, major retailers and lighting manufacturers have influenced the purchase of more than 2.3 million LEDs. Central Hudson is building on the success of the Retail Lighting Program by offering instant incentives on heat pump water heaters, Wi-Fi thermostats, showerheads, pool pumps and advanced power strips at the point-of-sale under the Retail Efficient Products Program.
- **Commercial and industrial projects:** In 2019, Central Hudson completed 900 additional commercial and industrial projects. Supported by a network of more than 540 local



600,000 LEDs distributed annually through the Residential Lighting Program through 2025



Achieve savings of 442 million kWh with high efficiency equipment rebates through 2025



12,000 heat pumps to be installed by the end of 2025



plumbing and HVAC installers, Central Hudson has retrofitted more than 5,500 commercial and industrial facilities with high efficiency equipment since 2012, resulting in energy savings of more than 5.5 million kWh per year.

Integrating renewable energy resources

Central Hudson is working with private developers and municipalities to provide customers with options to access renewable energy resources. One way is by integrating Community Distributed Generation and Community Choice Aggregation programs. Central Hudson has interconnected nearly 100 MW across 8,757 solar installations with an additional 300 proposed projects that would generate an additional 200 MW. **Community Distributed Generation** offers a way for a group of residents and businesses to share in the electricity produced through local renewable generation facilities. Central Hudson works with developers to ensure that the project can be safely and efficiently interconnected with the electric distribution system, and to reflect proper credits on participants' utility bills. **Community Choice Aggregation** allows participating local governments to procure energy supply service for their eligible constituents. Central Hudson is working with municipalities and others to ensure that customers are provided information and options when a project is proposed.

Infrastructure investments

Central Hudson continues to modernize electric and natural gas infrastructure to enable expanded use of clean energy resources. State-of-the-art equipment and systems are deployed to improve system efficiency, durability and

reliability, and to integrate and manage the growth of distributed resources such as solar and future battery storage.

Investments include a centralized Distribution Management System platform that will provide greater visibility and control over the electric distribution network. This technology will improve efficiency and deliver energy savings to customers without the need to change behavior or usage. It is estimated that customers will see up to a 2 percent reduction in kWh usage once the platform is fully deployed, reducing their energy costs while improving service.

- **Natural gas upgrade and expansion:** Existing natural gas infrastructure provides an opportunity for fuel-oil and propane users to switch to a cleaner heating option. Central Hudson is working to add 750 residential and 150 commercial natural gas customers annually. This will reduce emissions and more efficiently utilize existing infrastructure. Residential and commercial customers are eligible for rebates and incentives on efficient natural gas furnaces and boilers.
- **Statewide transmission improvements:** Central Hudson supports needed improvements to the state's bulk transmission system through its affiliation with New York Transco — a transmission development company owned by subsidiaries of Con Edison, National Grid, AVANGRID and CH Energy Group. New York Transco was selected by state regulators to replace and upgrade aging transmission lines in the Mid-Hudson Valley to relieve bottlenecks in the electric delivery system and enable 900 MW of clean upstate energy resources to be deliverable to areas downstate. These improvements will be built in existing corridors, replacing existing 80-year-old infrastructure.



40 percent increase in energy efficiency targets by 2025



9,300 solar installations interconnected with 350 more proposed



Central Hudson is working to add **750 residential** and **150 commercial natural gas customers** annually



284 South Avenue
Poughkeepsie, NY 12601

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