



POLICY BRIEF JUNE 2020

STATE OF THE NEW YORK CITY GRID

The electric system powering NYC is poised for a clean energy transformation.

New York State's nation-leading climate targets require an unprecedented greening of the state's electric grid over the next two decades. The grid is also more important than ever to buildings in NYC: the emissions caps in **Local Law 97** will soon make building owners accountable for carbon emissions from electricity use.

Fossil fuels dominate the current sources of NYC's electricity. Building large-scale renewables nearby is challenging, and existing transmission lines to bring clean energy from elsewhere are maxed out. In the near term the grid will also get dirtier: **Indian Point nuclear facility**—which historically provided a quarter of NYC's electricity—is fully closing by April 2021.

Cleaning the grid will require dramatic changes to electricity generation, transmission and distribution to NYC buildings, all while maintaining grid reliability.

With the long-term challenge of decarbonizing NYC's electricity in mind, this brief provides a snapshot of where we stand today.

ABOUT THE NYC GRID

Nearly 50 percent of NYC’s electricity comes from in-city power plants. The rest comes from Westchester and transmission lines that connect the city to over 6,000 MW of power from surrounding regions (though rules limit reliance on imported power). The local Con Edison distribution grid serves more than 9.5 million people in the NYC metro area. Since most of NYC’s electricity comes from fossil fuel generators, electricity use accounts for about one quarter of the city’s greenhouse gas emissions.

Some key details about NYC’s electricity system:

Energy is the amount of power generated or consumed over a period of time, measured in megawatt hours (MWh).

- Electricity generated in NYC in 2019: 23 million MWh (100 percent fossil fuel)
- Electricity used in NYC in 2019: 52 million MWh

Peak demand is the maximum power needed at one time in a day, season or year, and is measured in megawatts (MW). The grid must be sized to provide this maximum power, even though demand is lower for almost all other hours of the year.

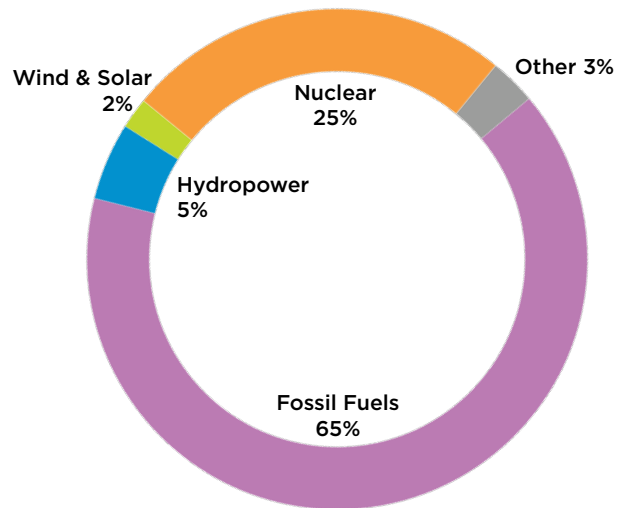
- Summer NYC peak in 2019: 10,800 MW
- Winter NYC peak in 2019-2020: 7,400 MW

Capacity is the maximum power a generator can produce at one time, and is measured in MWs.

- 24 in-city power plants (all run on fossil fuels) have a combined capacity of over 10,000 MW

NYC’s Electricity Supply

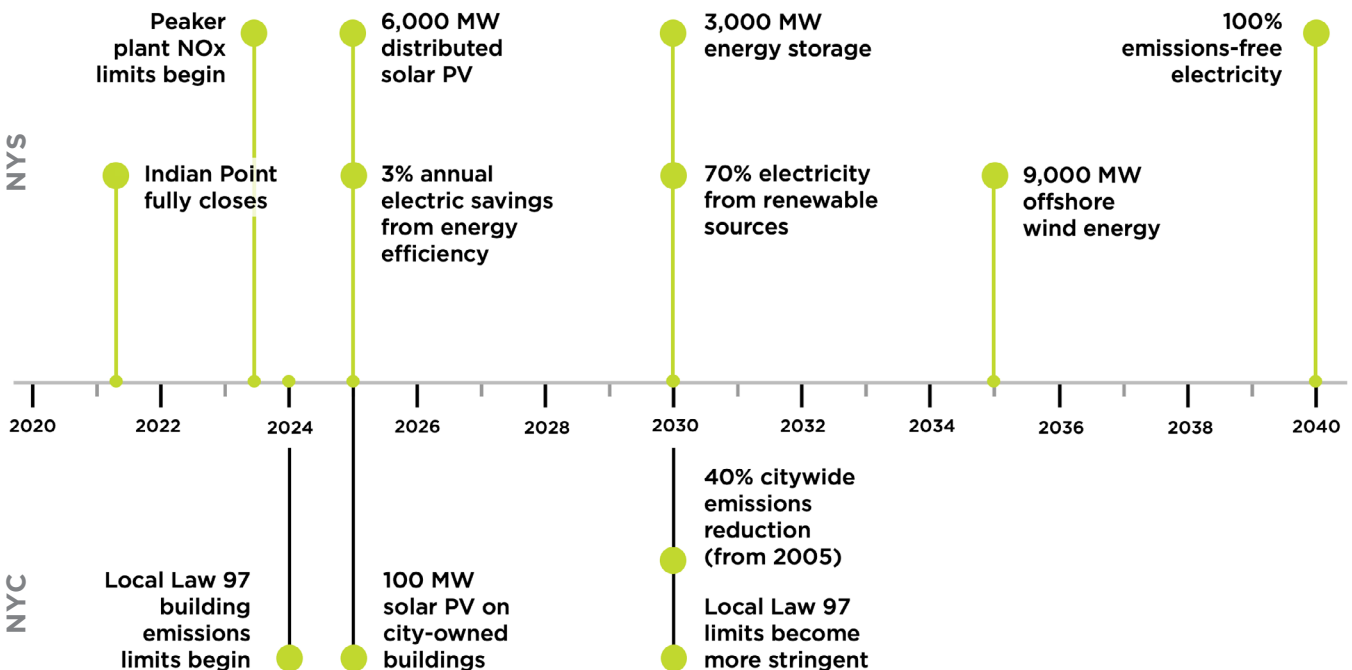
In 2018, fossil fuel generators supplied two-thirds of the city’s electricity. As Indian Point’s two nuclear reactors shut down, that number will increase until additional renewables come online.



SOURCE: NYC MAYOR'S OFFICE

Policy Mandates

Ambitious city and state requirements are driving toward more efficient buildings and a greener grid. Chief among them is the state-level CLCPA, which requires statewide electricity to be 70 percent renewable by 2030 and 100 percent carbon-free by 2040.



GENERATION

Many of the power plants that generate NYC's electricity are located in NYC and Westchester. The US EPA tracks this generation in its eGRID dataset, which is the source of Local Law 97's current electricity carbon coefficient. The latest data on this local generation fuel mix from 2018 shows:

- 60 percent natural gas
- 38 percent nuclear
- 1 percent fuel oil
- 1 percent waste-to-energy

These numbers don't include electricity imported from further away. They're also changing: one of Indian Point's two active reactors shut down in April of this year, and the plant will fully close in April 2021. For now, the gap in local power generation will be filled mostly by two new, highly efficient natural gas plants: the 1,100 MW **Cricket Valley Energy Center** and the 680 MW **CPV Valley Energy Center**.

Renewables require much more area and capacity to provide the same energy as fossil fuel generators. Since land near NYC is expensive and densely populated, the main emerging source of local, large-scale clean power is **offshore wind energy**. Current developments now underway include:

- **816 MW Empire Wind:** 14 miles south of Jones Beach and expected to deliver electricity into NYC by 2024.
- **880 MW Sunrise Wind:** 30 miles east of Montauk Point and expected to deliver electricity into Long Island by 2024.
- **1,000-2,500 MW offshore wind:** PSC-approved total for NYSERDA's next round of contracts, expected later in 2020.

NYC will rely primarily on natural gas power plants until new transmission lines and more renewables come online.

TRANSMISSION

Greening NYC's electricity depends in part on bringing renewable energy from areas where it's plentiful or cheaper to develop. But New York State currently has a transmission bottleneck that prevents upstate clean power from reaching downstate, where it is needed.

Policymakers are beginning to focus on this challenge. Last year, the NYISO greenlighted two projects to expand transmission in existing rights of

way and deliver more than 1,000 MW from upstate generators to the downstate area by 2024. And the state's new **Accelerated Renewables Act** includes a transmission investment program to fast-track new developments.

Offshore wind will require new transmission to connect directly to NYC. In addition, two proposed transmission projects would bring clean power directly into NYC:

- **1,000-1,250 MW Champlain Hudson Power Express:** A 333-mile line to transmit low-carbon hydropower from Quebec to Queens. The project is mostly permitted and set to begin construction in 2021, pending a power purchase agreement.
- **1,000 MW Empire State Connector:** A 265-mile line to transmit power from near Utica to Brooklyn. The project is soliciting bids for contracts to supply the electricity upstate and to consume the electricity downstate, with service planned for 2024.

DISTRIBUTION AND BUILDINGS




The distribution system is comprised of the infrastructure and local wires that deliver power directly to customers. Con Edison's upcoming Electric Long Range Plan will include capital investments to replace or upgrade old equipment in light of the CLCPA targets. The utility is also focused on grid-modernization programs, like the ongoing rollout of **five million smart meters** by 2022.

Increasingly, local grid strategies are focused on customer-side actions to reduce carbon and shift demand away from peak times. These distributed energy resources like solar PV, energy storage and demand response are on the rise in NYC:

- **210 MW** of installed solar capacity in NYC supported by NYSERDA incentives.
- **10 MW** of electrical battery storage installed, and about 50 properties with energy storage of some kind.
- **300 MW** of energy storage mandated for Con Edison territory by 2022.
- **316 MW** battery storage approved by the PSC for construction at the Ravenswood power plant in Queens to replace fossil fuel generation during peak times.
- Con Edison's **non-wires solutions** include the **BQDM** program, which pays customers to reduce energy use during peak times.
- **494 MW** of demand response capacity enrolled in NYC in summer 2019.

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ACRONYMS

BQDM: Brooklyn Queens Demand Management Demand Response Program

CLCPA: Climate Leadership and Community Protection Act

NYISO: New York Independent System Operator

Zone J: the NYISO electricity load region for New York City

NOTES

Greenhouse gas emissions for electricity from the 2017 Inventory of NYC Greenhouse Gas Emissions.

Energy, peak demand and capacity from NYISO **Gold Book 2020** (p. 19, 20, 23, 93 and 94). Excludes distributed solar.

Electricity supply from NYC Mayor's Office analysis using a grid model that accounts for local generation and electricity imports to Zone J (see analysis in **City of New York Public Policy Transmission Needs Proposal** filed with the NYISO June 19, 2019).

Electricity generation for NYC and Westchester from US EPA's **eGRID 2018**.

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