

APPENDIX A

Methodology

Cap and Invest to Meet New Yorkers' Needs

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Funding Framework

Total Revenue

The New York State Energy Research and Development Authority (NYSERDA) modeled three price ceiling scenarios for the state's cap-and-invest market. Those scenarios, designated A, B, and C, project three revenue trajectories over the first decade of the Clean Air Initiative's operation. This report assumes the revenue stream projected in Scenario C, the most conservative of the three modeled, with total revenues of \$57.4 billion. Below is a reproduction of the Scenario C revenue projections, with figures in the billions of dollars. The modeling in this report, when reporting annual figures, approximates by averaging revenues annually over the course of the decade.

2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
3.0	3.1	5.2	5.4	5.5	5.6	5.7	5.8	5.9	6.0	6.1

Program Overhead

This report assumes average operational costs of 4% across the board to implement and operate the cap-and-invest program. When calculating funding levels for each program, our allocations assume that 4% has already been set aside—effectively making 96% of the projected revenues available for affordability measures and direct investments.

More Affordable Homes

Energy Rebates

The Clean Air Initiative is required by statute to return at least 30% of all revenue to consumers to enhance energy affordability. We assume that those funds will be made available to low- and moderate-income households (i.e. those making less than \$200,000 annually) as rebates on their energy bills. On average, that translates to \$1,722,000,000 set aside for approximately 6,470,000 households, per the U.S. Census 2024 projections. Dividing those funds among those households yields this report's projection of \$266 per household annually.

Household Weatherization

New York State Department of Housing and Community Resources (HCR) implements a Weatherization Assistance Program (WAP). A 2022 report on the program estimated an average weatherization cost of \$7,600 per housing unit, and indicated annual savings of \$657 per household. NYSERDA runs the Empower+ program, which also provides weatherization assistance to low income households; according to a profile of the program from the U.S. Environmental Protection Agency (EPA), in 2023 it spent \$150,000,000 to weatherize 22,000 homes, which averages to \$6,818 per home. Aver-

aging the NYSERDA and HCR per-household costs yields a \$7,209 average cost for weatherizing a housing unit. With \$3,604,500,000 in Clean Air Initiative funding, the state could weatherize 500,000 homes at that cost.

Rooftop Solar

New York State's solar energy system tax credit covers 25% of equipment expenditures up to a cap of \$5,000. Supplementing that credit with an additional \$5,000 incentive per system installed—approximately replacing the now-defunct 30% federal tax credit for home solar installations, given that an average solar energy system in New York costs \$19,538—stands to halve the cost, on average, of rooftop solar installations in New York.

This report's household savings figure is derived from EnergySage's estimate that New York households will save about \$57,570 over 25 years from installing solar panels—an average of \$2,302.80 annually.

Heat Pumps

The Switchbox Bucks for Boilers report projects that "heat pumps would cut energy costs for 6,731,700 households, saving them an average of \$1,070 a year." Switchbox also estimates that the incremental cost of heat pump and heat pump water heater system over replacing an existing furnace, boiler, or resistance heater is \$16,474. This report assumes that covering more than 90% of that additional cost, at a subsidy of \$15,000 per system, would be sufficient to encourage more widespread uptake of heat pump systems. At that subsidy level, \$3,750,000,000 in incentives could translate to 250,000 new heat pump systems installed.

Cheap, Clean Energy

Expanding the Grid (Transmission)

Currently, the cost of electricity infrastructure is borne by utility customers, including a premium of guaranteed return for utilities. State funding to replace some consumer spending on transmission lines would lower utility bills for every electricity customer. We chose not to model a per-customer savings, instead more conservatively keeping our estimates to the total investment proposed.

Community Solar

A January 2024 report from NYSERDA on the NY-Sun program, which provides community solar incentives, estimates that \$346,000,000 in subsidies would support developing 1,254 MW of community solar farms with 10% savings on customers' utility bills under a Statewide Solar For All program. NYSERDA has separately indicated that 1 MW can power roughly 175 homes.

Using this ratio of power to households yields: $1,254 \text{ MW} * 175 \text{ households} / \text{MW} = 219,450 \text{ households}$ powered by community solar farms for a cost of \$346,000,000. That equates to \$1,576 per household in subsidies to incentivize the creation of community solar capacity. With \$1,576,000,000 of Clean Air Initiative funding, the state could therefore connect 1,000,000 more homes to community solar power over the next decade.

The average monthly electric utility bill in New York State is \$141.79. If community solar participation saves customers 10% on their utility bills, as assumed in NYSERDA's cost projections, then the average annual bill savings would come out to \$170.15.

Thermal Energy Networks

NYSERDA has identified 417 building clusters (page 8, sum of NYC and Rest of State campuses) that would make good candidates for thermal energy networks (TENs). These are clusters in which the buildings have common owners, are in close proximity, and have some centralized heating / cooling systems.

NYSERDA provides project funding for TENs through its Large Scale Thermal program. Much of the funding has gone to feasibility studies. Some of those studies include cost estimates for a TEN:

- SUNY Oswego finds a 4 building cluster will cost roughly \$13.3 million
- Syracuse University finds an 8 building cluster will cost roughly \$17.6 million

The Utility Thermal Energy Network Pilot Project is a separate New York program largely for collections of privately owned buildings. It has projected costs for multiple projects:

- Ithaca has a 39-building cluster expected to cost \$51.7 million
- Rochester has a 21-building cluster that's expected to cost \$42.3 million
- Norwich has a 32-building cluster expected to cost \$33.6 million

SUNY Buffalo's master plan also finds that a Thermal Energy Network for a 46-building cluster would cost \$311 million, but says that true costs would be \$182 million when netting out the alternative scenario in which the university has to maintain its existing system (i.e. \$182 million is the marginal cost of installing a TEN, instead of just replacing the existing system).

All together, these examples present an average of \$2.27 million per building of all-in cost for campus level thermal energy networks.

The current federal tax credit for TENs, without including adders, is 30%. That credit has not yet catalyzed widespread TENs adoption, and this report therefore proposes an additional state subsidy of 40%, stackable on the 30% credit, which would translate to a much higher incentive at a cost of \$900,000 per building for the state. We further suppose that a typical cluster converts ten buildings. The report therefore projects that \$1,800,000,000 in funding would support the construction of 200 TENs across New York.

Clean Air For Kids

Green, Healthy Schools

Alliance for a Greater New York (ALIGN) [estimates that deep retrofits](#) to all of New York City's public schools, including the materials and labor costs of electrification, would cost up to \$32 per square foot. ALIGN also estimates that installing solar energy systems across those schools, which are collectively 162 million square feet in area, would cost \$5.4 billion, or an additional \$33 per square foot. This report therefore assumes that green school conversions, including deep retrofits, electrification, and solar energy system installation would cost approximately \$65 per square foot of school.

According to [the National Council on School Facilities](#), New York State's public school buildings are collectively 433,000,000 million square feet in area, and the [Learning Policy Institute reports](#) that there are 4,802 public schools in New York State. Averaging to around 90,710 square feet per school, we project that deep retrofits, electrification, and solar energy system installation would cost roughly \$5.86 million for each public school in the state.

These estimates are broadly in line with costs reported by school districts as part of NYSERDA's [Clean Green Schools Initiatives](#):

- The [Cuba-Rushford School District](#) received \$6.1m to convert to heat pump systems in three school buildings
- The [Enlarged City School District of Middletown](#) received \$5.03 million for heat pumps for one school building.
- The Gouverneur Central School District received \$5.03 million to install a ground source heat pump and fully electrify a high school's HVAC system
- With \$5,860,000,000 in Clean Air Initiative investments, the state could then make these upgrades to approximately 1,000 schools over the next decade.

Clean Trucks and Buses

New York City won two grants from the U.S. Environmental Protection Agency's (EPA) 2024 [Clean Heavy Duty Vehicles Program](#). The first grant of \$17.3 million to the New York City Department of Citywide Administrative Services allowed the city to replace 55 diesel trucks with electric vehicles (EVs), install 10 additional fast chargers for those vehicles, and expand training for EV mechanics. That translates to \$314,545 in grant dollars awarded per truck, including the associated charging infrastructure and training. The second grant of approximately \$32 million to New York City School Bus Umbrella Services, Inc. supported the purchase of an additional 109 electric school buses, with grant funding of \$293,578 per bus.

[EPA's cost share](#) in the Clean Heavy Duty Vehicles Program was 75% for electric school buses and 65% for trucks. This report assumes that the state would halve that cost share, to 37.5% and 32.5%, respectively, for its own program, given more limited resources. We therefore project an approximate cost to the state of \$146,800 per electric school bus and \$157,250 per electric truck.

Improving Transportation

Increase Upstate Transit Service and Frequency

The New York Public Transit Association (NYPTA) recommends spending \$145 million per year to improve upstate transit service. That cost estimate includes improvements to more than half a dozen transit systems in Albany, Syracuse, Buffalo, Rochester, Binghamton, Westchester, Poughkeepsie, and Long Island. This report adopts NYPTA's recommendation.

Fast Electric Vehicle Charging Stations

On average, direct-current fast charging (DCFC) stations consist of two chargers with two ports each. According to NYSERDA, DCFC stations cost about \$25-50,000 for the charging equipment, combined with \$50-100,000 in electrical service upgrades. Using the midpoint for each, we assume a charging station with four ports will cost \$112,500, or \$28,125 per port.

Following the model of the National Electric Vehicle Infrastructure grant, we assume the state would cover up to 80% of charging port costs. That translates to a cost to the state of \$22,500 per charging port. Using the U.S. Department of Energy's estimate that New York would need 6,850 DCFC charging ports to support 2 million electric vehicles, this report allocates \$154,125,000 to fund a complete buildout of DCFC charging infrastructure.

Electric Vehicle Incentives

This report assumes a state incentive for new electric vehicles of \$3,750 per EV, for half the value of the previous federal tax credit. We assume a rebate of \$2,000 per used EV, in the model of New York's proposed Previously Owned Zero-Emission Vehicles Rebate Program.

Used EVs accounted for about 31% of all EV sales in the U.S. in November 2025, the latest data available at the time of writing. This report closely approximates that proportion, assuming a total allocation of \$400,000,000 to support the purchase of 200,000 used EVs and \$1,687,500,000 to support the purchase of 450,000 new EVs over the course of a decade—a sum total of 650,000 vehicles, 30.77% of which are used.

Investing in People and Communities

Community-Directed Investments

The report authors found it impractical to anticipate the nature of community-directed investments in advance, given that they will ultimately reflect the priorities of the communities themselves. For that reason, we instead generally account for \$2 billion of revenues being made available for planning, development, and implementation grants for disadvantaged communities, anticipating that those funds will be directed where local residents need them most.

Jobs Training Programs

Illinois' Climate and Equitable Jobs Act (CEJA) is regarded as one of the nation's leading models for integrating comprehensive workforce investments and labor standards into climate investments. A brief analysis indicates that about 4% of the annual investments under CEJA flow directly to workforce development programs. The report authors sought to approximately match that proportion of funding and allocated 2.5% of projected Clean Air Initiative revenues, or \$1,435,000,000 over the decade, to jobs training.

Support for Small Businesses

The Clean Air Initiative's revenues will move through the Climate Action Fund, which includes the Industrial Small Business Climate Action Account. That account delivers "up to 3 percent of proceeds to support energy affordability for industrial small businesses." This report assumes that the state will allocate the full 3%, or \$1,722,000,000, to that purpose.

Upgrading Public Infrastructure

NYC Public Housing

The report authors contemplated modeling specific uses for Clean Air Initiative investments in retrofits and upgrades at New York City Housing Authority (NYCHA) properties, such as expanding the Clean Heat for All pilot program, but ultimately determined that it would not be constructive to be overly prescriptive in how NYCHA should manage its investments in repairs, weatherization, or efficiency upgrades. For that reason, the report allocates \$500,000,000 to NYCHA over 10 years for repairs, weatherization, and efficiency without modeling the outcomes of a specific set of projects.

State-Owned Buildings

The heterogeneity of New York's state-owned building stock made general projections based on the cost of electrification or weatherization per square foot too unspecific to be useful in this report. That being the case, the report allocates \$500,000,000 to public building retrofits over 10 years without projecting the specific impact of those investments.

Forests and Urban Trees

According to [Forest for All NYC](#), the average cost of planting and maintaining a tree in NYC is \$3,300. With \$1,155,000,000 of dedicated funding over the next decade, the report projects that the city could plant 350,000 additional trees.

The Nature Conservancy estimates an average reforestation cost of \$6,500 per acre, reflecting updated cost estimates for site preparation and planting, tree protection, seedlings, maintenance and monitoring, planning, and landowner incentives. These estimates are derived directly from 2024-2025 nursery price lists, contractor quotes, and recent planting projects. With \$1,950,000,000 of funding over the next decade, the state could restore 300,000 acres of forestland.