



*Shutting down the single largest source of zero-carbon electricity in the downstate area jeopardizes the economy, safety, and well-being of New Yorkers, while contributing to catastrophic climate change.*

- ▽ The **Indian Point Nuclear Power Plant (IP)** generates 80% of the clean electricity (24% of the total) in downstate New York (Albany on south, NYC, and the surrounding metro area).<sup>1</sup>
- ▽ **The agreement** between New York State, Entergy (the plant's owner), and Riverkeeper (a local antinuclear group) to close IP was signed in early 2017<sup>2</sup> without public notice or participation.
- ▽ Despite a greater appreciation of climate change (NYC declared a "Climate Emergency" in 2019)<sup>3</sup> **there is scant awareness** that the first reactor (IP2) will permanently close in April 2020, followed by the second reactor (IP3) in April 2021, resulting in significant additional pollution from fossil fuel-fired generation.
- ▽ Despite Governor Cuomo's assurance at the time that replacement power will have "**no new carbon emissions**,"<sup>4</sup> these resources are not yet available. The agreement had **the foresight to include a provision to delay closure** by up to 4 years if needed.
- ▽ New York grid operator NYISO's deactivation report<sup>5</sup> shows that IP will be **replaced primarily by methane gas-fired generation** at Cricket Valley Energy (online since March 2020) and CPV Valley (operational since October 2018), making New York's electricity grid more fossil fuel-dependent than it has been since 2000.
- ▽ **Opposition to transmission projects**<sup>6</sup> prevents upstate wind and Canadian hydro power from reaching renewable-starved<sup>7</sup> downstate NY, where solar and wind provide only 2% of electricity.<sup>1</sup> Approval and construction of needed transmission projects remain highly uncertain.
- ▽ A recent comprehensive report from the Citizens Budget Commission, an influential think tank, found that the **projected expansion of solar and wind was "likely infeasible."**<sup>8</sup>
- ▽ The closure of IP means **NY is going backward** in terms of both GHG emissions and public safety, **for no rational or scientifically supportable reason.**<sup>9</sup> This is antithetical to combating climate change and is in direct opposition to NY's stated policy of reducing its carbon footprint.
- ▽ IP's closure will **increase annual CO<sub>2</sub>-equivalent emissions** by ~12-15 million metric tons, exacerbating global climate change.<sup>10</sup> Emissions from NY's power generation will increase 27-29% after IP3's closure in 2021,<sup>11,12</sup> endangering the state's ability to meet its nation-leading goals in the Climate Leadership and Community Protection Act (CLCPA).
- ▽ Electricity from **wind projects offshore Long Island** will not even start to service NYC until 2028,<sup>13</sup> and recent federal actions may cause substantial additional delays.<sup>14</sup>
- ▽ Switching from IP2's electricity to gas-fired generation will likely induce **75 cardiovascular disease-related deaths per year** from increased particulate matter pollution.<sup>15</sup> This would hurt the downstate economy \$731 million per year, using EPA's Value of Statistical Life.<sup>16</sup> The number

of preventable deaths could double with the closure of IP3 in April 2021. Regulated **nuclear power is the safest source of energy worldwide**,<sup>17</sup> and the IP generators have operated safely for 54 years.<sup>18</sup> Risks of an extremely low-probability nuclear accident<sup>19</sup> need to be balanced against documented health effects associated with outdoor air pollution.

- ▽ IP's shutdown will result in **additional fossil fuel burning at some of the dirtiest gas- and oil-“peaker” plants** in NYC, mostly located in poor and minority areas in the City.<sup>20</sup>
- ▽ Closing IP will **reduce the reliability** of the electric grid serving downstate New York, possibly causing widespread power outages, brownouts, and increased power costs.<sup>21</sup>
- ▽ While closure can be postponed until clean energy sources become available, the operator would likely need to be **compensated with Zero Emission Credits**, currently only afforded to upstate nuclear plants.<sup>22</sup>

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<sup>1</sup> NYISO. *Power Trends 2019*, Figure 16. May 2019. 2018 clean generation in TWh (nuclear 16.3 + hydro 2.6 + solar/other 1.6) vs. 69.3 TWh total downstate generation. <https://www.nyiso.com/documents/20142/2223020/2019-Power-Trends-Report.pdf#page=29>

<sup>2</sup> NY State, Riverkeeper, and Entergy. *Indian Point Closure Agreement*. January 2017. <http://www.nuclearny.org/documents/Indian-Point-Closure-Agreement-January-8-2017.pdf>

<sup>3</sup> Bernard / New York Times. *A ‘Climate Emergency’ Was Declared in New York City. Will That Change Anything?* June 2019. <https://www.nytimes.com/2019/07/05/nyregion/climate-emergency-nyc.html>

<sup>4</sup> Governor Cuomo Announces 10<sup>th</sup> Proposal of the 2017 State of the State: Closure of the Indian Point Nuclear Power Plant by 2021. January 2017. <https://www.governor.ny.gov/news/governor-cuomo-announces-10th-proposal-2017-state-state-closure-indian-point-nuclear-power>

<sup>5</sup> NYISO. *Generator Deactivation Assessment Indian Point Energy Center*. December 2017. The other identified methane project, uprate of the plant at Bayonne Energy Center II in New Jersey, has been withdrawn. <https://www.nyiso.com/documents/20142/1396324/Indian-Point-Generator-Deactivation-Assessment-2017-12-13.pdf>

<sup>6</sup> Eadie / Sierra Club - Atlantic Chapter. *Stop CHPE; No need to import Canadian electricity from 1,200 miles away*. March 2015. <https://atlantic2.sierraclub.org/content/stop-chpe-no-need-import-canadian-electricity-1200-miles-away>

<sup>7</sup> New York League of Conservation Voters Education Fund. *Breaking Down the Barriers to Renewable Energy in New York State*. March 2019. <https://www.aceny.org/blog/2019/3/12/breaking-down-the-barriers-to-renewable-energy-in-new-york-state-1>

<sup>8</sup> Citizens' Budget Commission. *Getting Greener: Cost-Effective Options for Achieving New York State's Greenhouse Gas Goals*. December 2019. [https://cbcny.org/sites/default/files/media/files/REPORT\\_GettingGreener\\_120602019\\_3.pdf](https://cbcny.org/sites/default/files/media/files/REPORT_GettingGreener_120602019_3.pdf)

<sup>9</sup> Specter / Micro Utilities. *The Best Emergency Plan for Indian Point, Rev. 2*. November 2019 [http://www.infoshare.org/main/The\\_Best\\_Emergency\\_Plan\\_for\\_Indian\\_Point\\_-\\_HSpecter.pdf](http://www.infoshare.org/main/The_Best_Emergency_Plan_for_Indian_Point_-_HSpecter.pdf)

<sup>10</sup> Combined Cycle Gas Turbines generate 758-932 gCO<sub>2</sub>-eq/kWh at 2.3%-3.5% methane leak rates. Displacing 16.3 TWh of nuclear generation (12 gCO<sub>2</sub>-eq/kWh) with gas-fired electricity increases annual GWP<sub>20</sub> emissions by 12.2-15.0 million tonnes (Mt) CO<sub>2</sub>e. Methane is a 84x-worse pollutant than CO<sub>2</sub> over a 20-year time horizon (GWP<sub>20</sub>). New York's CLCPA defined CO<sub>2</sub> equivalencies for other greenhouse gases over 20 years, a time-frame appropriate for addressing the urgency of climate change.

UN IPCC. *Technology-specific Cost and Performance Parameters Annex III*, Table A.III.2. 2014. [https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc\\_wg3\\_ar5\\_annex-iii.pdf#page=7](https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_annex-iii.pdf#page=7).

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*Measuring Methane: A Groundbreaking Effort to Quantify Methane Emissions from the Oil and Gas Industry*. 2018. <https://www.edf.org/sites/default/files/EDF-Methane-Science-Brochure.pdf>.

Cornell Chronicle. *Howarth advised on methane portions of NY's new climate law* <https://news.cornell.edu/stories/2019/07/howarth-advised-methane-portions-nys-new-climate-law> July 2019.

Biogeosciences. *Ideas and perspectives: is shale gas a major driver of recent increase in global atmospheric methane?* <https://www.biogeosciences.net/16/3033/2019/>

<sup>11</sup> NYSERDA. *New York State Greenhouse Gas Inventory*, Table 1. July 2019. <https://www.nyserda.ny.gov/-/media/Files/EDPPP/Energy-Prices/Energy-Statistics/greenhouse-gas-inventory.pdf>

<sup>12</sup> Environmental Progress. *Closure of Indian Point Would Spike Power Emissions 29%, Reversing 14 years of Declines*. January 2017. <http://environmentalprogress.org/big-news/2017/1/8/breaking-closure-of-indian-point-would-spike-power-emissions-29-reversing-14-years-of-declines>

<sup>13</sup> NYSERDA. *Offshore Wind Policy Options Paper*. January 2018. Page 85. Table 17: Capex, opex, and capacity factor results for the base deployment case. Base-case deployment of capacity serving NYC: 400MW in 2028, 400MW in 2029, 400MW in 2030. These add up to 4.9 TWh. <https://www.nyserda.ny.gov/-/media/Files/Publications/Research/Biomass-Solar-Wind/Master-Plan/Offshore-Wind-Policy-Options-Paper.pdf>

<sup>14</sup> Storrow / E&E News. *Trump admin throws wrench into offshore wind plans*. August 2019. <https://www.eenews.net/stories/1060921573>

<sup>15</sup> Pollution impacts from electricity switching modeled using the ReCiPe method for Life cycle impact assessment with SimaPro V10 by PRE Consultants. Cricket Valley generation (1,100 MW x 65% capacity utilization) will increase PM<sub>2.5</sub> concentration by 3.5 µg/m<sup>3</sup> over a 25-mile radius, home to 592k residents (as per NYC Metro Region Explorer <https://metroexplorer.planning.nyc.gov/People/>). Prorated cardiovascular disease (CVD) mortality of 1,437 x 0.9% x 3.5 µg/m<sup>3</sup> = 45.2 incremental deaths per year. CPV Valley (678 MW x 65% utilization) impacts 551k residents, increasing cardiovascular disease-related deaths by 30. Background particulate matter concentration data extracted from Brauer, et al. *Exposure Assessment for Estimation of the Global Burden of Disease Attributable to Outdoor Air Pollution*. Environmental Science & Technology 2012, 46, 652–660. <http://dx.doi.org/10.1021/es2025752>. CVD mortality relationship from Dockery, DW; Pope, CA 3rd; Xu, X; Spengler, JD; Ware, JH; Fay, ME; Ferris, BG Jr; Speizer, FE. *An association between air pollution and mortality in six U.S. cities*. December 1993. N Engl J Med. 329(24):1753-9. <https://www.ncbi.nlm.nih.gov/pubmed/8179653>. Intraurban intake fraction dataset from Apte, JS; Bombrun, E; Marshall, JD; Nazaroff, WW. *Global intraurban intake fractions for primary air pollutants from vehicles and other distributed sources*, Environmental Science & Technology 46, p. 3415-3423, 2012. <http://dx.doi.org/10.1021/es204021h>

<sup>16</sup> EPA. *Mortality Risk Valuation*. Retrieved February 2020. <https://www.epa.gov/environmental-economics/mortality-risk-valuation>

<sup>17</sup> Ritchie / OurWorldInData. *What are the safest sources of energy?* February 2020 <https://ourworldindata.org/safest-sources-of-energy>

<sup>18</sup> U.S. Nuclear Regulatory Commission <https://www.nrc.gov/info-finder/reactors/ip2.html> and <https://www.nrc.gov/info-finder/reactors/ip3.html>

<sup>19</sup> Latest findings from the United Nations and WHO studies indicate that there will be less than 1 radiation-related fatality due to the Fukushima Nuclear Accident versus over 15,500 from the tsunami caused by a category 9 earthquake. UNSCEAR. 2013. *Sources, Effects and Risks of Ionizing Radiation*, [https://www.unece.org/docs/publications/2013/UNSCEAR\\_2013\\_GA-Report.pdf#page=19](https://www.unece.org/docs/publications/2013/UNSCEAR_2013_GA-Report.pdf#page=19) and WHO. FAQs: *Health consequences of Fukushima Daiichi Nuclear Power Plant accident in 2011* [https://www.who.int/ionizing\\_radiation/a\\_e/fukushima/faqs-fukushima/en/](https://www.who.int/ionizing_radiation/a_e/fukushima/faqs-fukushima/en/)

<sup>20</sup> New York City Council Committee on Environmental Protection. *Res. No. 320: Resolution calling on the state of New York to phase out Number 4 and Number 6 fuel oil in power plants in its plan to meet carbon dioxide reduction goals*. November 2016. Available upon request.

<sup>21</sup> Craig / Daily Voice PLUS. *Engineer Predicts Indian Point Closure Will Cause Widespread Blackouts, Pollution*. <https://dailyvoiceplus.com/westchester/politics/engineer-predicts-indian-point-closure-will-cause-widespread-blackouts-pollution/746826/>

<sup>22</sup> McDermott Will & Emery / EnergyBusinessLaw. *NY Creates New Emissions Credit for Nuclear Plants*. September 2016. <https://www.energybusinesslaw.com/2016/09/articles/environmental/ny-creates-new-emissions-credit-for-nuclear-plants/>