



Environmental Justice Issues
After Indian Point Closes

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ABOUT THE AUTHOR

Herschel Specter, President of Micro-Utilities, Inc., holds a BS in Applied Mathematics from the Polytechnic Institute of Brooklyn and a MS from MIT in Nuclear Engineering. He is a Licensed Professional Engineer in the State of New York. He has had a long association with the Indian Point nuclear power plants starting as a member of the Atomic Energy Commission (now the Nuclear Regulatory Commission) where he was the Licensing Project Manager for the original licensing of the Indian Point 3 nuclear plant in the 1970s. In the 1980s the New York Power Authority hired Mr. Specter to manage the defense of Indian Point 3 in a federal adjudicatory trial in the wake of the Three Mile Island nuclear accident in Pennsylvania. Prior to joining NYPA, Mr. Specter served at diplomat rank for 5 years at the International Atomic Energy Agency in Vienna, Austria where he headed up an international effort writing design safety standards for nuclear power plants.

Mr. Specter has been Chairman of two national committees on emergency planning and was a guest lecturer for several years on emergency planning at Harvard's School of Public Health. He led an effort as a consultant to Entergy analyzing emergency responses during a hypothetical terrorist attack on Indian Point. Mr. Specter has presented testimony at the National Academy of Sciences on the Fukushima accident and on other nuclear safety matters and has been a guest speaker at many universities on matters of energy policy. Today he is one of 14 Topic Directors in Our Energy Policy Foundation, a group of about 1500 energy professionals who seek to bring unbiased and comprehensive energy information to our political leaders and members of the public.

Mr. Specter has been active on social and environmental matters. He has been a Big Brother and in 1971 had the honor of being selected as "Big Brother of the Year" for all of the USA and Canada. He also received a personal letter of commendation from the President of the United States for his work with the Youth Conservation Corps.

Mr. Specter was born in White Plains, NY and lives there now.

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1.0 Executive Summary

The impacts of closing the Indian Point nuclear power plants on achieving climate change goals, on the electrical system reliability, and on the price of electricity have been discussed before. Little has been said about possible environmental justice issues. They could be significant and are discussed here.

2.0 Introduction

This analysis explores the possibility that electricity shortages in NYC from the closure of the Indian Point nuclear plants may force NY State/Con-Ed to increase its use of existing “peaker” plants and other fossil fueled power plants in New York City in order to prevent brownouts and blackouts. Such greater use of peaker plants would significantly increase the release of greenhouse gases, specifically carbon dioxide, add to the city’s air pollution, and may cause serious health effects. Since many of these polluting fossil plants in NYC are in Potential Environmental Justice Areas, an increase in the use of these peaker fossil plants might be an environmental justice issue.

3.0 Background

When Governor Cuomo announced in January, 2017 the impending closure of Indian Point 2 and Indian Point 3 on April 30, 2020 and April 30, 2021, respectively, he committed to the people of New York that “Replacement Power Will be in Place that Adds No New Carbon Emissions...”. Yet the New York Independent Systems Operator, NYISO, in December, 2017 reported that three gas plants, then under construction, would replace both carbon-free Indian Point power plants¹. Replacing Indian Point with gas, a fossil fuel, is in direct conflict with the Governor’s environmental commitment, yet the Governor remained silent.

Two major analyses have been conducted since 2017. The first analysis examined the environmental impact if these three gas plants actually replaced Indian Point. The second analyses explored what actions NY State/Con Ed might be forced to do to assure a reliable and sufficient electricity system, should these three replacement gas plants fail to fully replace Indian Point, and the consequences of such actions. The second set of analyses is the main purpose of this report and includes a limited review of the environmental justice impacts of closing the Indian Point nuclear power plants.

4.0 Fully Replacing Indian Point with Gas

In 2018 the combined output of the two Indian Point nuclear plants was 16,334 gigawatt-hours (GWh) of carbon-free electricity. If gas were to fully replace Indian Point this would lead to the release of about 7 million metric tons of GHG, year after year. This huge annual release of GHG would, in less than three years, completely negate all the cumulative GHG reductions brought about by all the solar panels and all the wind turbines within NY State since year 2003.

NY plans to invest billions of dollars in a 9,000 Megawatt off-shore, the world’s largest, wind farm to be completed by 2035. Unfortunately, fully replacing Indian Point with gas renders this

¹ The 120 MW Bayonne gas uprate + 678 MW CPV gas plant + the 1020 MW Cricket Valley gas plant.

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enormous project near useless. The cumulative GHG reductions brought about by this gigantic off-shore wind farm will be less than the cumulative GHG releases from these Indian Point gas replacements until around year 2038, or later. With climate scientists warning us that we must start to rein in climate change within 12 years or less, an off-shore wind farm break-even date of 2038 is far too late.

NY State recently passed the CLCPA act. This enormous off-shore wind farm would be essential to its successful implementation. Replacing Indian Point with gas would undermine the whole CLCPA act before it even got started.

Because of the existential threat of climate change, many environmental groups oppose replacing existing nuclear power plants with fossil fueled power plants. This opposition has been voiced by the Union of Concerned Scientists, The Environmental Defense Fund, the Natural Resources Defense Fund, and by Riverkeeper.

5.0 The Reliability of NYC's Electricity Supply System

NYC already has a serious problem with its electricity supply system. A very large and growing fraction of its electricity supply capacity is well beyond the age² when it should have been retired and replaced by modern electricity sources. Closing Indian Point, which supplies 25% of the city's electricity, significantly adds to the jeopardy the city already is in.

A review³ of the adequacy of the three Indian Point replacement gas plants has been conducted. This review showed that even if all three gas plants were dedicated to replacing Indian Point, their combined output would result in a 23% shortfall, 3,788 megawatt-hours, compared to the two Indian Point plants. Other gas plants may have to be called upon to make up for this shortfall by the three NYISO identified gas plants.

However, two of these three NYISO identified gas plants, the Bayonne Uprate and the CPV plant, do not appear to actually be available to replace Indian Point. The Bayonne Uprate plant, a gas peaker plant, should never been counted as a possible replacement to Indian Point. Peaker plants serve a different purpose than base load plants like Indian Point. After building a 6.5 mile long submarine cable from Bayonne, New Jersey to Brooklyn, NY, the Bayonne plant, already in service to Brooklyn, would not be available to replace Indian Point. Similarly, the CPV plant, now rated at 621.7 MW from its original 678 MW, also is already in service to NYC. By replacing older, less efficient, gas plants in NYC, CPV claims that it reduces GHG releases by around 500,000 metric tons per year. This large environmental benefit would be lost if the CPV plant were used to replace Indian Point.

This only leaves the 1020 MW Cricket Valley plant, expected to be operational by 2020, as possibly available to replace the two Indian Point nuclear plants.

² "New York City's Aging Power Plants: Risks, Replacement Options, and the Role of Energy Storage." Strategen Consulting, September 20, 2017

³ "Where Will the Electricity Come From?", Herschel Specter, Micro-Utilities, April, 2019, mhspecter@verizon.net

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5.1 What happens when Indian Point 2 closes?

If Indian Point 2 is closed by April 30, 2020 and if the 1020 MW Cricket Valley gas plant were fully operational by then, there would still be a shortfall of about 316 megawatt hours per year. This might be tolerated because it is small compared to the whole electricity demand in NYC, around 53,360 megawatt hours per year. However, this use of the Cricket Valley plant to replace Indian Point 2 would lead to an increase in GHG releases of approximately 3.3 million metric tons of carbon dioxide every year.

Lessons might be taken from the CPV plant which claims to reduce GHG by 500,000 metric tons per year because it replaces more GHG intensive older gas plants. The Cricket Valley power plant is much larger than the CPV plant, 1020 MW versus 621.7 MW, or 1.64 times larger. If Cricket Valley could replace older NYC gas plants, like CPV does, this might be worth $(1.64)(500,000) = 820,000$ metric tons of carbon dioxide each year. Instead of causing an annual 3.3 million metric ton increase in the CO₂ releases by replacing Indian Point 2, there might be a savings of about 820,000 metric tons each year, a swing of about 4.1 million metric tons of carbon dioxide per year⁴. To appreciate the magnitude of this swing, these 4.1 million metric tons release per year matches the GHG releases from the manufacturing industries and construction in NYC. In 2015 NYC released 52.0 million metric tons of GHG from all sources⁵ of which 13.3 million metric tons comes from electricity production. Based on NYISO data⁶, in 2018 the whole electricity sector in for all of NY State produced about 33 million metric tons of carbon dioxide. The swing of about 4.1 million metric tons of GHG tied to the CPV plant is a large fraction of NYC's and NY State's GHG releases from the electricity sector. Overall, fully replacing Indian Point with gas would release 7 million metric tons of GHG per year, more than a 20% of the whole electricity sector for NY State.

5.2 What happens when Indian Point 3 closes?

If Indian Point 3 were to close by April 30, 2021 none of the three gas plants NYISO identified as replacements for Indian Point would be available. In 2018 Indian Point 3 generated 8,333 MWh of carbon-free electricity. Because of this very large shortfall New York State and Con-Ed might have to turn to these older and polluting peaker gas plants to prevent brownouts and blackouts during peak demand periods, and perhaps more frequently. It is not clear if these over-aged gas plants would even be up to the task.

⁴ The assumption here is that Indian Point is fully replaced by gas. This would require other gas sources beyond this identified by NYISO. With these additional gas sources, the total GHG releases comes to about 7 million metric tons per year.

⁵ "Inventory of New York City Greenhouse Gas Emissions in 2015", Figure 1, April, 2017

⁶ NYISO "Power Trends 2019", Figure 22 combined with NYISO, "2019 Load & Capacity Data Report" Table 1-2

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5.3 Reliability and climate change

The Indian Point nuclear plants are reliable, operating over 93% of the time. They do not release GHG. Neither NY State nor any other group has yet put forth an Indian Point replacement plan that is both reliable and protects the environment.

6.0 Air Quality Impacts from Older Peaking Units

According to Section 2 of the Strategen report (See footnote 2):

“Exposure to ground-level ozone and fine particulate matter (PM 2.5) pollution are major health risks for New York City residents. According to the NYC Department of Health and Mental Hygiene, exposure to ozone above background levels causes New Yorkers to suffer annually from:

- *400 premature deaths*
- *850 hospitalizations and*
- *4500 emergency department visits for asthma*

Meanwhile, ozone –related hospital admission rates are 2x higher for children and 4x higher for adults in high poverty neighborhoods.

While New York City has made significant progress in addressing several types of air pollution over recent years, it has struggled to significantly reduce levels of ozone and PM 2.5. In fact, New York City and the surrounding areas are currently in non-attainment for federal ozone standards. In 2015, the U.S. Environmental Protection Agency established a maximum 8-hour average ozone concentration standard of 70 ppb. Figure 7 indicates that the regions where the state is in non-attainment with the standard. As of September 1, 2017 the NYC metro area already exceeded this standard on 14 occasions in the year.

Ozone pollution is formed by emissions from a variety of sources including NO_x emissions from power plants. In addition to contributing to NO_x and SO_x, emissions also serve as a precursor for PM 2.5 pollution. Recent analysis by NY DEC shows that NO_x emissions from old combustion turbine power plants have contributed significantly to NO_x emissions on high ozone days. DEC modeling showed that older peaking plants may be contributing ~5ppb toward the 8-hour daily max for ozone concentration of 70 ppb.”

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6.1 TABLE A-1

TABLE A-1, derived from the Strategen report, lists the ten highest emitting plants, nine of which are in Potential Environmental Justice areas. These plants are ranked by their total ozone season emissions, averaged over 2011 to 2016.

TABLE A-1 Ten Highest Polluting Plants

Rank	Name	NOx Controls?	Tons of NOx Emissions, in 2016	Located in Potential Environmental Justice Area?
1	Ravenswood	Yes	1,147	Yes
2	Arthur Kill	No	344	No
3	Astoria generating station	No	196	Yes
4	Narrows	No	199	Yes
5	Astoria Gas Turbine	No	119	Yes
6	East River	No	128	Yes
7	Gowanus	No	41	Yes
8	Astoria 1&11	Yes	69	Yes
9	59 th Street	Yes	32	Yes
10	NYPA Astoria CC	Yes	36	Yes

7.0 Conclusion

The **CP** in the recently passed **CLCPA** act stands for **Community Protection**. To achieve this there must be environmental justice. Replacing the Indian Point plants with gas generated electricity, particularly if such electricity comes from gas power plants in Potential Environmental Justice areas, is in conflict with the **Community Protection** aspect of the **CLCPA** act. Allowing gas to replace the carbon-free Indian Point nuclear plants or failing to prevent shortages of electricity is in conflict with the **CL** portion of the **CLCPA** act.