A Community Assessment of Health Impacts from the Pittsfield Generating Facility on Local Communities

Prepared on behalf of the Massachusetts Clean Peak Coalition

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Executive Summary

The City of Pittsfield houses 22 Massachusetts environmental justice neighborhoods and the Pittsfield Generating Facility—a 176 MW fossil fuel-fired power plant that generates electricity during times of peak electric demand—which is near many of the City's K-12 schools, public parks, and the Housatonic River. The combustion of gas or oil fuel at Massachusetts electric power plants like the Pittsfield Generating Facility releases both local and global pollutants, causing increased rates of negative health impacts in the surrounding area, including higher rates of cancer, respiratory illnesses, and cardiovascular disease. Low-income and Black, Indigenous, and People of Color communities are especially vulnerable to health risks from pollution exposure because these communities face disproportionately high exposure to environmental contaminants and are more likely to lack access to healthcare facilities.

Replacing the aging Pittsfield Generating Facility peaker plant with an alternative, cleaner energy source like a solar plus storage facility can help reduce community exposure to pollution, improve health outcomes, and support the Commonwealth in meeting its climate targets. This Applied Economics Clinic (AEC) report, prepared on behalf of the Massachusetts Clean Peak Coalition, summarizes the negative impacts related to fossil fuel-fired emissions from the Pittsfield Generating Facility and how negative impacts from this polluting Facility fall disproportionately across the City.

More frequent operation of the Pittsfield Generating Facility in the future would increase greenhouse gas emissions and local air pollution, exacerbating the negative health outcomes of overburdened residents; this concern leads to three key takeaways (see ES-Table 1). First, as long as the Pittsfield Generating Facility is in operation, it has the potential to produce much higher greenhouse gas emissions and co-pollutants in any given year. Second, Pittsfield's vulnerable populations live in close proximity to the Facility, putting them at a disproportionate risk for the negative health impacts associated with fossil fuel-fired generation. Lastly, replacing the Facility with clean energy resources can not only improve the health outcomes for residents, but also aid the Commonwealth in achieving its decarbonization goals.

ES-Table 1. Key takeaways

Key Takeaway #1: As long as the Pittsfield Generating Facility is in operation, it has the potential to produce much higher greenhouse gas emissions and co-pollutants in any given year.
Key Takeaway #2: EJ and other vulnerable communities live in close proximity to the Pittsfield Generating Facility, increasing vulnerability to adverse health outcomes.
Key Takeaway #3: Replacing the fossil fuel-fired plant with clean energy resources can reduce emissions in the area.

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I. Introduction

Fossil fuel-fired electric generation releases both global and local pollutants that can negatively impact the health of individuals and the environment around them.[1] Greenhouse gas emissions from fossil fuel-fired plants contribute to global climate change, impacting everyone, whereas local air pollutants from power plants primarily impact the health of those living and working nearby.[2] In Pittsfield, Massachusetts, residents are exposed to emissions from the gas- and oil-fired Pittsfield Generating Facility. The communities located in Pittsfield have experienced increased health impacts associated with proximity to the plant.

Vulnerable populations across the country are considered to be more at risk to the negative health impacts from exposure to fossil fuel-fired combustion at electric power plants. In particular, income, age, healthcare access, and housing characteristics have an impact on the likelihood and severity of health impacts related to pollution exposure and other environmental stressors.[3] For example, according to the Environmental Protection Agency (EPA), Black, Indigenous, and People of Color (BIPOC) populations and low-income populations in the United States face disproportionate rates of respiratory and lung diseases from exposure to pollution; these adverse health outcomes have been linked to exposure to pollutants released from fossil fuel combustion.

This Applied Economics Clinic (AEC) report, prepared on behalf of the Massachusetts Clean Peak Coalition (Slingshot, Berkshire Environmental Action Team, Massachusetts Climate Action Network, and Clean Energy Group), assesses disparities in health outcomes across the City of Pittsfield and examines the burden placed on residents from the co-location of multiple hazardous and polluting sources and facilities. Section II reviews the Pittsfield Generating Facility's operating characteristics and a discussion of the negative health impacts related to fossil-fuel emissions. Section III presents a health vulnerability index (HVI) for Pittsfield based on U.S. Center for Disease Control and Prevention data; Section IV discusses the benefits alternative clean energy sources could provide Pittsfield as they relate to emissions reduction; and Section V summarizes key takeaways from this analysis.

II. Pollution from the Pittsfield Generating Facility

The Pittsfield Generating Facility is a fossil fuel-fired power plant located in Pittsfield, Massachusetts. Pittsfield residents face a higher risk of exposure and subsequent negative health impacts, like asthma and heart attacks, from local pollutants released by fossil fuel-fired peaker plants due to their proximity to the

[1] U.S. Environmental Protection Agency (EPA). N.d. "Human Health & Environmental Impacts of the Electric Power Sector." Available at: https://www.epa.gov/power-sector/human-health-environmental-impacts-electric-power-sector.

[2] (1) U.S. EPA. N.d. "Human Health & Environmental Impacts of the Electric Power Sector."; (2) U.S. EIA. June 2024. "Power Plants in the U.S."; (3) U.S. EPA. N.d. "Power Plants and Neighboring Communities." Available at: https://www.epa.gov/power-sector/power-plants-and-neighboring-communities; (3) U.S. EPA. June 27, 2024. "Climate Change Indicators: Greenhouse Gases." Available at: https://www.epa.gov/climate-indicators/greenhouse-gases.

[3] U.S. EPA. N.d. "Climate Change and the Health of Socially Vulnerable People." Available at: https://www.epa.gov/climateimpacts/climate-change-and-health-socially-vulnerable-people.

Facility. As a result, communities in Pittsfield have higher rates of adverse health outcomes related to pollution exposure than those living elsewhere in Berkshire County.[4]

Pittsfield Generating Facility only runs during times of the highest electric demand

The Pittsfield Generating Facility is a dual-fuel power plant located in Pittsfield, Massachusetts. This Facility is currently the only peaker plant (a plant that only runs during times of the highest electric demand and sits unused for the rest of the year) still in operation in Berkshire County; the Doreen peaking plant, also located in Pittsfield prior to its retirement, and the Woodland Plant, located in Lee, Massachusetts, both retired in 2022.[5]

The plant was built in 1990 with four combined-cycle units—all of which remain in operation today—that run primarily on gas but can accommodate oil use (see Table 1)[6] and is currently owned by Hull Street Energy, LLC, and operated by Pittsfield Generating Company, LP.[7] It hosts a total of 176 megawatts (MW) of capacity.[8] Over the past seven years, generation at the plant has steadily and substantially decreased; 117.9 gigawatt hours (GWh) of electricity was produced in 2018 or a capacity factor—the amount of electricity produced over the year compared to the maximum it could have produced—of 7.7 percent compared to just 19.9 GWh (a capacity factor of 1.3 percent) in 2023. In 2024, Pittsfield's capacity factor rose: January through November 2024 generation is 8 GWh higher than total 2023 generation.

As Pittsfield's electric generation has declined over time, so too has its fuel use and related emissions (see Table 1 below). In 2018, nearly 1,082,200 metric million British thermal units (MMBtu) of fuel were used at the plant, with 1,011,400 MMBtu from gas.[9] In the first 11 months of 2024, 295,900MMBtu of gas has been used for electric generation. In comparison, Pittsfield used 192,900 MMBtu from January to November in 2023, indicating an increased use of gas at the Facility in 2024.[10] Oil use made up less than 7 percent of total MMBtu consumed in 2018; between 2019 and 2024, the share of oil used for Pittsfield's generation peaked in 2023 at 1.3 percent of total MMBtu.

[4] U.S. Center for Disease Control. 2022. "PLACES: Census Tract Data (GIS Friendly Format), 2024 release." Available at: https://chronicdata.cdc.gov/500-Cities-Places/PLACES-Census-Tract-Data-GIS-Friendly-Format-2024-/yjkw-uj5s/about_data.
[5] U.S. Energy Information Administration (EIA). 2018-2023. *Form EIA-860*. Available at: https://www.eia.gov/electricity/data/eia860/.
[6] Britton-Mehlisch, M. 2021. "Look Ahead, Pittsfield: What you should know about the local 'peaker' plant permit on the line this week." *The Berkshire Eagle.* Available at: https://www.berkshireeagle.com/news/central_berkshires/look-ahead-pittsfield-peaker-plant-permit/article_c7860160-5477-11ec-a0e2-b352bb16ce0b.html.
[7] (1) GridInfo. N.d. "Pittsfield Generating LP." Available at: https://www.gridinfo.com/plant/pittsfield-generating-lp/50002; (2) U.S. EIA. 2018-2023. *Form EIA-860*.
[8] U.S. EIA. 2018-2023. *Form EIA-923*. Available at: https://www.eia.gov/electricity/data/eia923/; U.S. EIA. 2018-2023. *Form EIA-860*. Available at: https://www.eia.gov/electricity/data/eia860/.
[9] U.S. EIA. 2018-2023. *Form EIA-923*. Available at: https://www.eia.gov/electricity/data/eia923/.
[10] Ibid.

Table 1. Pittsfield Generating Facility characteristics (2018-2024)

Year	Generation (MWh)	Capacity Factor (%)	Gas Use (MMBtu)	Oil Use (MMBtu)	Total Fuel Use (MMBtu)
2018	117,955	7.7%	1,011,411	70,748	1,082,159
2019	80,162	5.2%	730,904	5,296	736,200
2020	35,296	2.3%	331,598	2,248	333,846
2021	63,751	4.1%	592,547	2,129	594,676
2022	56,796	3.7%	551,000	1,907	552,907
2023	19,983	1.3%	192,945	2,544	195,489
2024 (Jan - Nov)	28,068	3.6%	295,930	2,041	297,971

Data source: 1) U.S. EIA. 2018-2024. "Form EIA-923." [Page 1 Generation and Fuel Data]. Available at: https://www.eia.gov/electricity/data/eia923/; U.S. EIA. 2018-2023. "Form EIA-860." Available at: https://www.eia.gov/electricity/data/eia860/.

Most U.S. combined-cycle gas units like Pittsfield are not operated as peakers; combined cycle gas units had an average U.S. capacity factor of 59.7 percent in 2023. Gas peakers are typically a separate category of generator called a "combustion turbine", with a 2023 U.S. average capacity factor of 12.9 percent.[11]

Pittsfield Generating Facility releases pollutants with negative health impacts

Fossil fuel-fired power plants, like the Pittsfield Generating Facility, release both global and local pollutants that can negatively impact the health of individuals and the environment around them (see Table 2 below).[12] Emissions of carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (NO_x) contribute to global climate change that negatively impacts the health of communities.[13] Nearly 30 percent of the total U.S. CO_2 emissions result from the combustion of fossil fuels for electric generation.[14] In addition to greenhouse gases (CO_2, CH_4, and NO_x), fossil fuel-fired plants release "co-pollutants": local air pollutants including sulfur dioxide (SO_2), mercury (Hg), and particulate matter (PM) that have serious health impacts.[15] In particular, NO_X and SO_2 are "highly reactive", meaning they interact easily with other pollutants in the air,

[11] U.S. EIA. 2023. "Electric Power Monthly." Available at: https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_6_07_a.
[12] U.S. EPA. N.d. "Human Health & Environmental Impacts of the Electric Power Sector."
[13] U.S. EPA. N.d. "Climate Change Impacts on Health Overview." Available at: https://www.epa.gov/climateimpacts/climate-change-impacts-health.
[14] (1) U.S. EPA. N.d. "Human Health & Environmental Impacts of the Electric Power Sector."; (2) U.S. EIA. June 2024. "Power Plants in the U.S." Available at: https://hub.arcgis.com/datasets/fedmaps::power-plants-in-the-u-s--2/about; (3) U.S. EPA. April 11, 2024. "Overview of Greenhouse Gases." Available at: https://www.epa.gov/ghgemissions/overview-greenhouse-gases.
[15] (1) U.S. EPA. N.d. "Human Health & Environmental Impacts of the Electric Power Sector."; (2) U.S. EIA. June 2024. "Power Plants in the U.S."; (3) U.S. EPA. N.d. "Power Plants and Neighboring Communities." Available at: https://www.epa.gov/power-sector/power-plants-and-neighboring-communities.

creating acid rain and contributing to the formation of ground-level ozone.[16] Exposure to ozone pollution can negatively affect the lungs, leading to inflamed and damaged airways, aggravation of existing conditions such as asthma, emphysema, and chronic bronchitis, and difficulty breathing.[17]

Table 2. Local air pollutants and their related health impacts

Pollutant	Health Impacts
PM	Expsoure can lead to premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, increased respiratory symptoms (airway irritation, coughing, difficulty breathing).
SO_2	Short-term exposure can harm the respiratory system and make breathing difficult. SO_2 can combine with other pollutants in the air and contribute to PM and ozone pollution.
Hg	Exposure to mercury can have irrerversible health impacts including a decline in neurological function. Mercury can be found as an air pollutant, in fish and shellfish, and in water.

Source: (1) U.S. EPA. N.d. "Health and Environmental Effects of Particulate Matter (PM)." Available at: https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm; (2) U.S. EPA. N.d. "Sulfur Dioxide Basics." Available at: https://www.epa.gov/so2-pollution/sulfur-dioxide-basics; (3) U.S. EPA. N.d. "Health Effects of Exposures to Mercury." Available at: https://www.epa.gov/mercury/health-effects-exposures-mercury.

Short-term exposure to SO_2 can cause difficulty breathing, particularly in children and people with asthma; high concentrations of SO_2 can also form sulfur oxide in the air when combined with other compounds, contributing to the ambient level of PM in the air.[18] Similarly, airborne PM is linked to a variety of negative health outcomes affecting both the lungs and heart such as premature death, heart attacks, asthma, and decreased lung function.[19] A 1993 study published in the New England Journal of Medicine found a direct association between PM exposure and premature mortality, particularly from lung cancer and heart disease, for study participants in Watertown, Massachusetts, and five other cities.[20] More recently, a 2020

[16] (1) U.S. EPA. N.d. "Human Health & Environmental Impacts of the Electric Power Sector."; (2) U.S. EPA. N.d. "Power Plants and Neighboring Communities." Available at: https://www.epa.gov/power-sector/power-plants-and-neighboring-communities; (3) EPA. N.d. "Integrated Science Assessment (ISA) Ecological Criteria Assessment for Oxides of Nitrogen, Oxides of Sulfur, and Particulate Matter." Available at: https://www.epa.gov/isa/integrated-science-assessment-isa-ecological-criteria-assessment-oxides-nitrogen-oxides-sulfur.

[17] U.S. EPA. April 9, 2024. "Health Effects of Ozone Pollution." Available at: https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution.

[18] Sulfur oxide reacts with other chemicals in the atmosphere to create ambient particulate matter. California Air Resources Board. N.d. "Sulfate & Health." Available at: https://ww2.arb.ca.gov/resources/sulfate-and-health. "

[19] U.S. EPA. N.d. "Health and Environmental Effects of Particulate Matter (PM)."

[20] Dockery, D. W., et al. December 9, 1993. "An Association between Air Pollution and Mortality in Six U.S. Cities." *The New England Journal of Medicine, 329(24).* Available at: https://www.nejm.org/doi/full/10.1056/NEJM199312093292401.

study published in the *American Journal of Epidemiology* found that short- and long-term exposure to PM, ozone, and NO_x increased mortality risk in Massachusetts Medicare beneficiaries from 2000 to 2012.[21]

Pittsfield Generating Facility more CO_2e in the first half of 2024 than in all of 2023

Air emissions released by the Pittsfield Generating Facility are subject to the federal Clean Air Act (CAA) administered by the EPA, which requires polluting facilities to reduce and control specific "criteria air pollutants" that include greenhouse gases as well as carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide.[22] During the first quarter of 2023, compliance monitoring found that Pittsfield had violated CAA emissions limits and the violation still remains unresolved.[23]

The Pittsfield Generating Facility's greenhouse gas emissions have fallen in recent years; from 2018 to 2023, annual carbon dioxide equivalent (CO_2e) emissions fell from 58,979 metric tons (MT) to 10,437 MT (see Figure 1 below). Pittsfield experienced a substantial decline in CO_2e emissions in 2020, during the COVID-19 pandemic, however, emissions increased by 13,900 MT in the following year. A six-year low occurred in 2023, with emissions totaling 10,400 MT. Despite its recent decline in annual emissions, CO_2e emissions in the first 11 months of 2024 were greater than in all of 2023, highlighting the potential for increased greenhouse gas emissions from the plant if called upon to operate more frequently in coming years.[24]

In the past seven years, gas-fired generation has accounted for over 90 percent of annual CO_2e emissions and generation at the Pittsfield Generating Facility (see Table 3 below). Because oil has a higher emission rate than gas (0.81 MT per MWh compared to 0.52 MT per MWh), gas combustion results in less emissions than would be produced if oil was burned to create the same amount of electricity.[25] This means that in any future year in which Pittsfield relies on a higher share of oil for its fuel, the plant's emissions would rise substantially.

The Pittsfield Generating Facility is subject to Massachusetts' Operating Permit and Compliance Program.[26] Under this program, any existing facility with the potential to emit "50 or more tons per year of volatile organic compounds or NO_x, 10 or more tons per year of a single Hazardous Air Pollutant (HAP), 25 or more tons per year of combined HAPs, or 100 or more tons per year of any other pollutant" must have operating

[21] Yaguang W., Wang, Y., Wu, X., Di, Q., Shi, L., Koutrakis, P., Zanobetti, A., Dominici, F., Schwartz, J. D. (2020). "Causal Effects of Air Pollution on Mortality Rate in Massachusetts." *American Journal of Epidemiology*, 189(11), p. 1316 – 1323. Available at: https://doi.org/10.1093/aje/kwaa098.

[22] U.S. EPA. April 25, 2024. "Clean Air Act Standards and Guidelines for Electric Utilities." Available at: https://www.epa.gov/stationary-sources-air-pollution/clean-air-act-standards-and-guidelines-electric-utilities.

[23] Enforcement and Compliance History Online. 2024. "Detailed Facility Report." Available at: https://echo.epa.gov/detailed-facility-report?fid=110000308480#pollutants.

[24] The increase in emissions is a result of the plant consuming nearly 20,000 million British Thermal Units more of gas in the first half of 2024 than was used in all of 2023. Source: U.S. EIA. 2023. Form EIA-860.

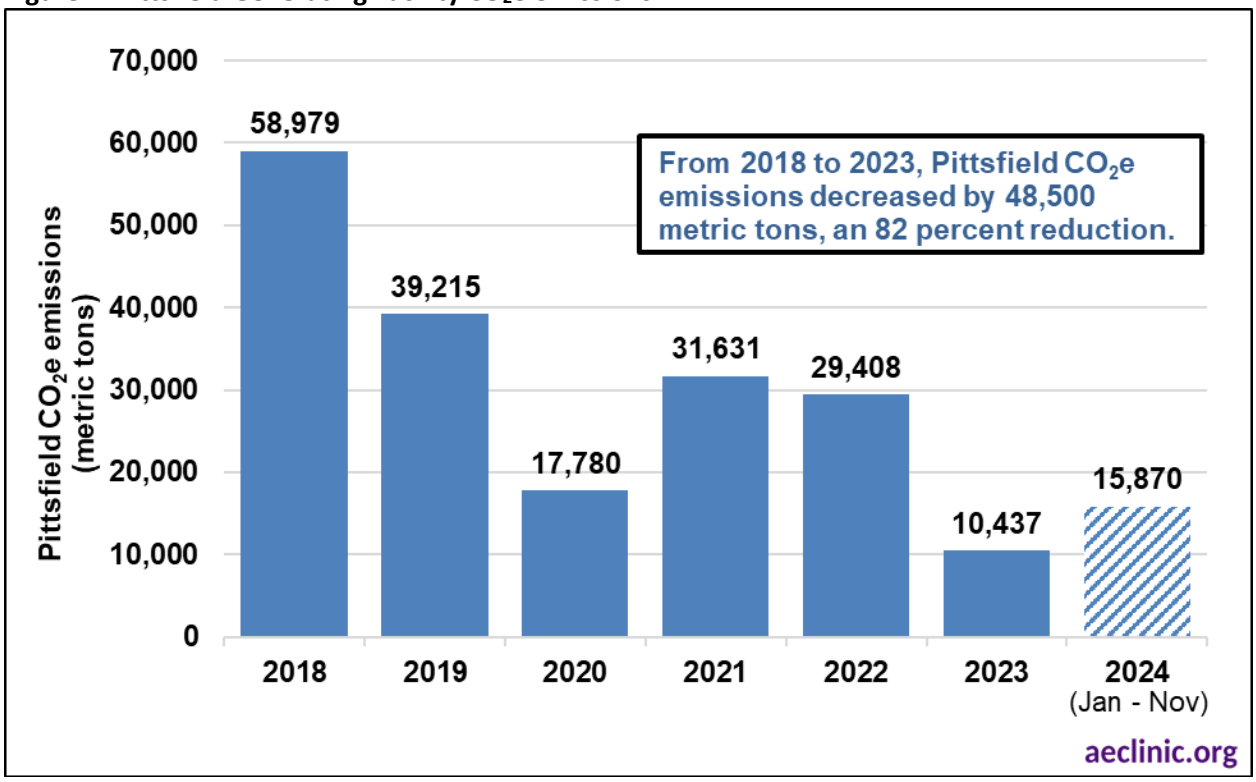
[25] U.S. EIA. N.d. "Natural gas explained." Available at: https://www.eia.gov/energyexplained/natural-gas/natural-gas-and-the-environment.php.

[26] Pittsfield Generating Company LP. 2021. *Pittsfield Generating Operating Permit Renewal fact sheet*. Available at: https://eplace.eea.mass.gov/EEAPublicApp/applicationdetails.html.

permits.[27] The Pittsfield Generating Facility has the potential to emit more than 100 tons of SO_2 and 50 tons of NO_X annually, qualifying it for an operation permit.[28]

While the plant has the potential to emit over 150 tons of SO_2 and NO_X combined within a year, historic emissions have been substantially lower as a result of the plant's limited annual operation (see Table 4 below). Between 2018 and 2022, the plant emitted, on average, 1.1 tons of SO_2 and 6.2 tons of NO_X. The plant largely operates in the summer months—during ozone season[29]—when the emissions from the plant could further exacerbate local health concerns associated with increased summertime exposure to ozone. Between 2020 and 2023, the plant ran a total of 149 days, 121 of which were during ozone season (March to September).[30]

Figure 1. Pittsfield Generating Facility CO_2e emissions



Data source: U.S. EIA. 2018- 2024 Page 1 Generation and Fuel Data. Form EIA-923. Available at: https://www.eia.gov/electricity/data/eia923/.

[27] MassDEP. N.d. "MassDEP Operating Permit & Compliance Program." Available at: https://www.mass.gov/guides/massdep-operating-permit-compliance-program.
[28] Pittsfield Generating Company LP. 2021. *Pittsfield Generating Operating Permit Renewal fact sheet*.
[29] Note: The EPA notes that ozone seasons begins in March and ends in September in Massachusetts. Source: U.S. EPA. November 12, 2024. "Ozone Seasons." Available at: https://aqs.epa.gov/aqsweb/documents/codetables/ozone_seasons.html.
[30] (1) U.S. EPA. May 23, 2024. "Clean Air Markets Program Data." Available at: https://campd.epa.gov/data/custom-data-download; (2) U.S. EPA. November 12, 2024. "Ozone Seasons."

Table 3. Pittsfield Generating Facility historic CO_2e emissions by fuel

Metric	Fuel	2018	2019	2020	2021	2022	2023	2024*
CO_2e Emissions (metric tons)	Gas	53,721	38,822	17,613	31,473	29,266	10,248	15,718
	Oil	5,258	394	167	158	142	189	152
	Total	**58,979**	**39,215**	**17,780**	**31,631**	**29,408**	**10,437**	**15,870**
Generation (MWh)	Gas	109,508	79,634	35,050	63,523	56,624	19,751	27,844
	Oil	8,447	528	246	228	172	232	224
	Total	**117,955**	**80,162**	**35,296**	**63,751**	**56,796**	**19,983**	**28,068**
Emissions Rate (metric tons CO_2e per MWh)	Gas	0.49	0.49	0.50	0.50	0.52	0.52	0.56
	Oil	0.62	0.75	0.68	0.69	0.82	0.81	0.68
	Total	**1.11**	**1.23**	**1.18**	**1.19**	**1.34**	**1.33**	**1.24**

Data source: (1) U.S. EIA. 2024. Form EIA-923. Available at: https://www.eia.gov/electricity/data/eia923/; (2) U.S. EPA. 2024. "GHG Emissions factor Hub." Available at: https://www.epa.gov/climateleadership/ghg-emission-factors-hub.
**Note: Data covers January through November 2024.*

Table 4. Pittsfield Generating Facility local air pollutants

Metric	Pollutant	2018	2019	2020	2021	2022	Average
Emissions (tons)	SO_2	1.9	1.3	0.6	1.1	1.0	1.2
	NO_X	10.3	7.1	3.1	5.7	4.9	6.2

Data source: U.S. EPA. 2018-2022. Historical eGRID Data. Available at: https://www.epa.gov/egrid/historical-egrid-data.

III. Equity Analysis

Factors such as income, age, healthcare access, and housing characteristics can impact how vulnerable individuals are to pollution and environmental stressors.[31] According to EPA, children, older adults, BIPOC populations, and low-income communities are all particularly vulnerable to the health risks associated with air pollution because they are more likely to live in areas with greater susceptibility to environmental hazards, aging infrastructure, limited financial resources, and cultural, language, or citizenship barriers.[32]

Children tend to be more susceptible to health risks from exposure to air pollution due to their higher breathing rates, increased outdoor activity levels, and increased interactions with their environment (i.e.,

[31] U.S. EPA. N.d. "Climate Change and the Health of Socially Vulnerable People." Available at: https://www.epa.gov/climateimpacts/climate-change-and-health-socially-vulnerable-people.
[32] U.S. EPA. N.d. "Climate Change and the Health of Socially Vulnerable People."

touching and ingesting items in their surroundings), making them more exposed to harmful pollutants.[33] Older adults, on the other hand, face increased vulnerability due to age-related declines in immune system function, pre-existing health conditions, and limited mobility, which complicates their ability to avoid or compensate for pollution-related health risks.[34]

In the United States BIPOC individuals are exposed to more air pollution—and breathe in more particulate air pollution—than other groups[35]; exposure to contaminants in the air can affect lung function and other respiratory diseases, as well as increase the risk of heart attack. These ailments are exacerbated when pre-existing conditions are present.[36] EPA's Power Plants and Neighboring Communities Mapping Tool demonstrates that BIPOC and low-income populations experience disproportionate rates of adverse health outcomes linked to pollution from fossil fuel facilities. EPA data show that BIPOC and low-income populations are more likely to live near power plants; 39 percent of the U.S. population identifies as BIPOC, and 53 percent of people living within three miles of power plants are BIPOC individuals. In addition, 31 percent of the U.S. population is classified as low-income; low-income individuals make up 34 percent of the population within three miles of a power plant.

Socioeconomic factors impacting an individual's environment, such as limited access to healthcare, poor housing conditions, or inadequate resources to mitigate environmental stressors like extreme heat, can increase vulnerability to air pollution and its associated health risks, especially in low-income communities.[37] In general, people living in neighborhoods with lower average incomes are more vulnerable due to the proximity of sources of air pollution, underlying health problems, poor nutrition, or stress.[38] For vulnerable populations, compounding factors exacerbate and hinder their ability to adapt and mitigate in the face of increased environmental stressors such as air pollution.[39] Evidence shows that socioeconomically disadvantaged communities are already predisposed to increased exposure to harmful air pollution and emissions leading to adverse health outcomes. A Harvard T.H. Chan School of Public Health study found that Black, Asian, Hispanic, and Latino populations are historically more exposed to greater concentrations of air pollutants than White populations.[40]

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[33] Gamble, J. L., & Balbus, J. 2016. *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*. [Chapter 9]. Prepared on behalf of U.S. Global Change Research Program. Available at: https://health2016.globalchange.gov/low/ClimateHealth2016_09_Populations_small.pdf, p. 255

[34] (1) AirNow. N.d. "Older Adults and Air Quality." Available at: https://www.airnow.gov/air-quality-and-health/older-adults/; (2) Gamble, J. L., & Balbus, J. 2016. *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*. Prepared on behalf of U.S. Global Change Research Program. p. 258

[35] U.S. EPA. September 20, 2021. "Study Finds Exposure to Air Pollution Higher for People of Color Regardless of Region or Income."Available at: https://www.epa.gov/sciencematters/study-finds-exposure-air-pollution-higher-people-color-regardless-region-or-income.

[36] Gamble, J. L., & Balbus, J. 2016. *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*. [Chapter 9]. Prepared on behalf of U.S. Global Change Research Program. p. 257

[37] Ibid. p. 255

[38] Ibid. p. 252

[39] Ibid. p. 252

[40] Harvard T.H. Chan School of Public Health. January 12, 2022. "Racial, ethnic minorities and low-income groups in U.S. exposed to higher levels of air pollution." Available at: https://www.hsph.harvard.edu/news/press-releases/racial-ethnic-minorities-low-income-groups-u-s-air-pollution/.

More than 20 block groups in Pittsfield are environmental justice neighborhoods

The Pittsfield Generating Facility is located near the center of the Western Massachusetts City of Pittsfield, and is adjacent to environmental justice (EJ) neighborhoods (see Figure 2 below). In Massachusetts, EJ neighborhoods are characterized as meeting one or more of the following:[41]

- "[T]he annual median household income is 65 percent or less of the statewide annual median household income
- minorities make up 40 percent or more of the population
- 25 percent or more of households identify as speaking English less than "very well"
- minorities make up 25 percent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income."[42]

EJ neighborhoods commonly face disproportionately high exposure to environmental contaminants as well as disparities in access to health care, placing the individuals in the neighborhoods at disproportionate risk for negative health outcomes, such as cancer, respiratory illnesses, and cardiovascular disease.[43] As of 2022, the City of Pittsfield had 22 census block groups designated as EJ neighborhoods.[44] The Pittsfield Generating Facility is located within two miles of many of the EJ neighborhoods as well as many of the City's K-12 schools, public parks[45], and the eastern branch of the Housatonic River.[46] One school—Allendale

[41] Massachusetts Executive Office of Energy and Environmental Affairs. N.d. "Environmental Justice Populations in Massachusetts." Available at: https://www.mass.gov/info-details/environmental-justice-populations-in-massachusetts

[42] Ibid.

[43] (1) Gochfeld, M., & Burger, J. 2011. "Disproportionate exposures in environmental justice and other populations: the importance of outliers." *American Journal of Public Health*, 101(S1), S53-S63. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC3222496/#; (2) Banzhaf, S., Ma, L., and Timmins, C. 2019. "Environmental Justice: The Economics of Race, Place, and Pollution." *Journal of Economic Perspectives, 33 (1),*185-208. Available at: https://www.aeaweb.org/articles?id=10.1257/jep.33.1.185; (3) Miranda, L. M., Edwards, S. E., Keating, M. H., and Paul, C. J. 2011. "Making the Environmental Justice Grade: The Relative Burden of Air Pollution Exposure in the United States." *International Journal of Environmental Research and Public Health, 8(6),*1755-1771. https://doi.org/10.3390/ijerph8061755.

[44] Massachusetts Bureau of Geographic Information. 2022. *2020 Environmental Justice Populations*. Available at: https://s3.us-east-1.amazonaws.com/download.massgis.digital.mass.gov/shapefiles/census2020/EJ%202020%20updated%20municipal%20statistics%20Nov%202022.pdf.

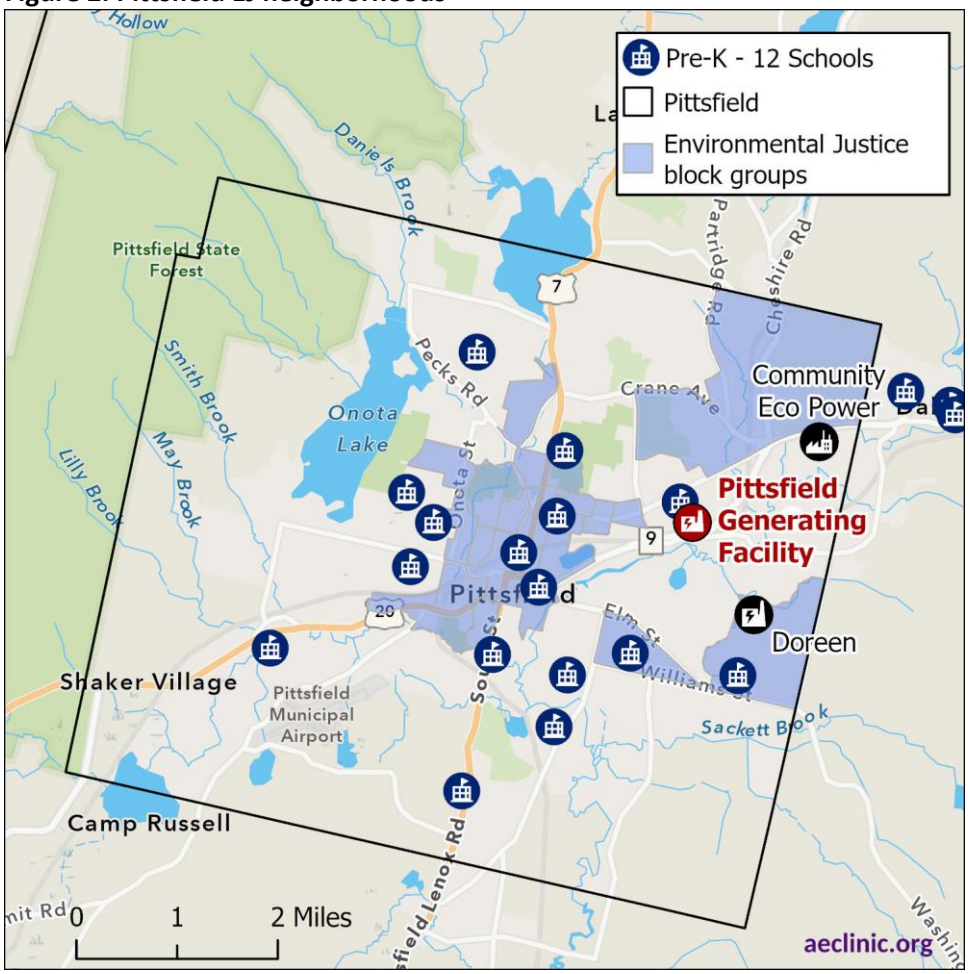
[45] Berkshires Outside. N.d. "Allen Heights Park."

[46] (1) MassWildlife's Natural Heritage & Endangered Species Program. 2011. "The River and Its Valley." Available at: https://www.mass.gov/doc/the-river-and-its-valley/download; (2) MassWildlife and The Nature Conservancy. N.d. "BioMap: The Future of Conservation in Massachusetts." Available at: https://gis.eea.mass.gov/portal/apps/webappviewer/index.html?id=e2b6c291e0294c3281488621aaa095bf.

Elementary school, with enrollment of 273 students, shares a property line with the Facility.[47]

In 2022, Pittsfield's BIPOC population comprised 18 percent of the total population, more than 6 percent greater than Berkshire County as a whole. Further, 22.2 percent of Pittsfield's population was living below the federal poverty line ($29,678 for a family of four) compared to 18.4 percent for Berkshire County and just 15.6 percent for Massachusetts as a whole.[48] English-isolated households make up 1.32 percent of the population in Pittsfield, slightly more than Berkshire County but far lower than Massachusetts. (See Table 5 below for a detailed breakdown of demographics).

Figure 2. Pittsfield EJ neighborhoods



Note: Block groups are divisions of census tracts that have the same first digit of their four-digit census block number

[47] (1) Niche. N.d. "Allendale Elementary School." Available at: https://www.niche.com/k12/allendale-elementary-school-pittsfield-ma/; (2) Berkshires Outside. N.d. "Allen Heights Park." Available at: https://berkshiresoutside.org/place/allen-heights-park-pittsfield-ma/.

[48] United States Census Bureau. 2023. Poverty Thresholds for 2022 by Size of Family and Number of Related Children Under 18 Years. Available at: https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html.

and contain between 600 to 3,000 people. Source: United States Census Bureau. N.d. "Glossary." Available at: https://www.census.gov/programs-surveys/geography/about/glossary.html#par_textimage_4.Data source: (1) U.S. EIA. 2020. Form 860. Available at: https://www.eia.gov/electricity/data/eia860/; (2) Massachusetts Bureau of Geographic Information. 2023. "MassGIS Data: Massachusetts Schools (Pre-K through High School)." Available at: https://www.mass.gov/info-details/massgis-data-massachusetts-schools-pre-k-through-high-school; (3) Massachusetts Bureau of Geographic Information. June 6, 2024. "MassGIS Data: 2020 Environmental Justice Populations." Available at: https://www.mass.gov/info-details/massgis-data-2020-environmental-justice-populations.

Table 5. Population demographics of Pittsfield, Berkshire County, and Massachusetts

Area	Population	% BIPOC	% Below Poverty Line	% Limited English
Pittsfield	43,730	18.0%	22.2%	1.32%
Berkshire County	128,763	11.8%	18.4%	0.88%
Massachusetts Statewide	**6,984,205**	**27.3%**	**15.6%**	**6.01%**

Data source: U.S. Census Bureau. 2022. American Community Survey 5-Year Estimates. [Table IDs: S1602, B03002, S1701]. Available at: https://data.census.gov/.

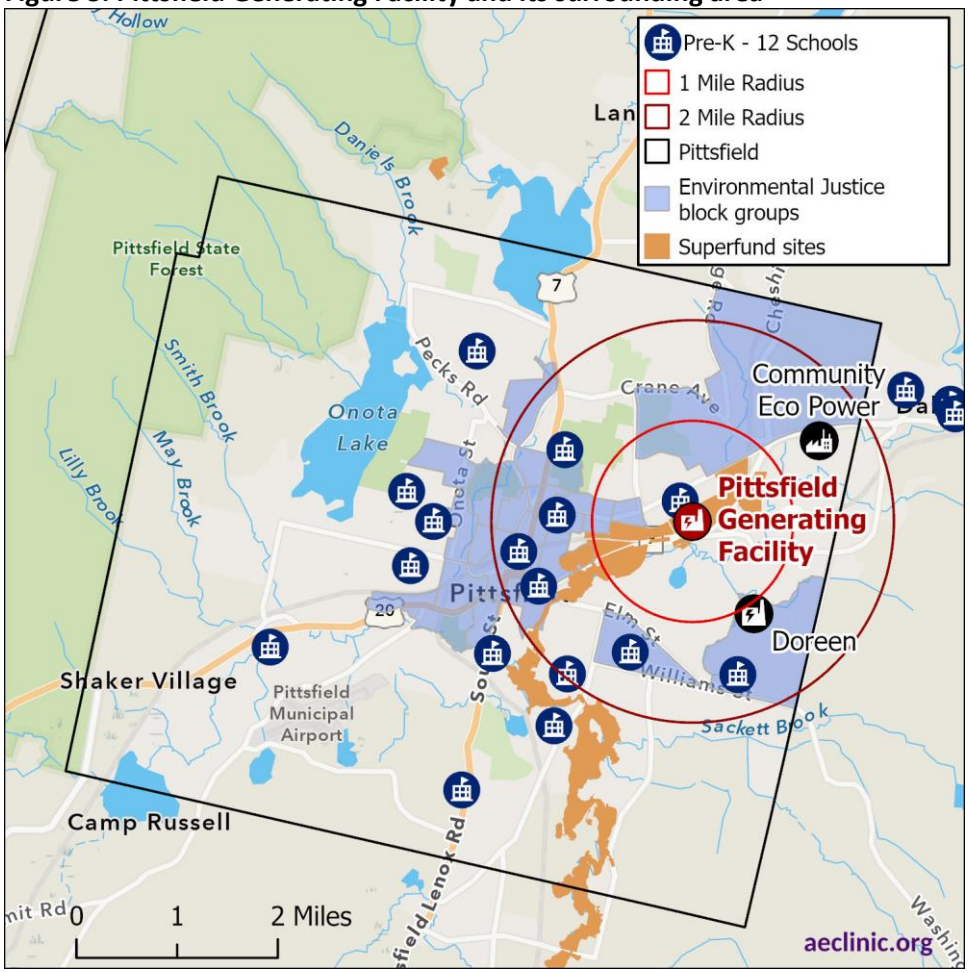
Vulnerable populations live in close proximity to the Pittsfield Generating Facility

EPA uses a 3-mile radius when assessing the impacts of air emissions on local communities but notes that health impacts also can be experienced in neighborhoods located farther away.[49] Eight K-12 schools are located within just two miles of the Pittsfield Generating Facility (see Figure 3). Allendale Elementary is the closest of these schools and shares a property line with the plant. In addition to schools, the plant is in close proximity to senior centers and senior housing communities; the Rose Manor senior housing community is 0.6 miles from the plant, and the Ralph J. Froio Senior Center is 2.3 miles from the plant. Pittsfield residents living and working near the plant have also been exposed to air pollution from two other electric generating plants (Doreen and Community Eco Power plants) that retired in 2022; both retired plants are within a two-mile radius of the Pittsfield Generating Facility.[50]

[49] U.S. EPA. N.d. "Power Plants and Neighboring Communities."

[50] (1) U.S. EIA. 2018-2023. *Form EIA-860*; (2) Waste Advantage. April 12, 2022. "With No Other Bidders, Sale of Community Eco Power to Casella Appears Imminent." Available at: https://wasteadvantagemag.com/with-no-other-bidders-sale-of-community-eco-power-to-casella-appears-imminent/.

Figure 3. Pittsfield Generating Facility and its surrounding area



Data source: (1) U.S. EIA. 2020. Form 860. Available at: https://www.eia.gov/electricity/data/eia860/; (2) Massachusetts Bureau of Geographic Information. 2023. "MassGIS Data: Massachusetts Schools (Pre-K through High School)." Available at: https://www.mass.gov/info-details/massgis-data-massachusetts-schools-pre-k-through-high-school.

Pittsfield residents are exposed to multiple polluting and hazardous sites

In Pittsfield, the co-location of hazardous sites and polluting facilities puts residents at a higher risk of negative health outcomes. In addition to the Pittsfield Generating Facility, up until 2022 two other peaker power plants were in operation in Berkshire County: the Doreen Plant located in Pittsfield and the Woodland Plant in Lee, both of which began operation in 1969 and ran on oil, emitting both CO_2 and co-pollutants at a higher rate than gas-fired plants.[51] Doreen and Woodland were retired and demolished in

[51] (1) U.S. EIA. 2023. *EIA Form-860*. Available at: https://www.eia.gov/electricity/data/eia860/; (2) Polito, B. July 2024. "Two Berkshire Peaker Plants Have Been Put in the Past." Available at: https://www.iberkshires.com/story/76085/Two-Berkshire-Peaker-Plants-Have-Been-Put-in-the-Past.html.

2022. Pittsfield was also home to the Community Eco Power trash burning plant (or "waste-to-energy" facility) until 2021; Community Eco Power burned 80,000 tons of trash from Pittsfield and Berkshire County in 2021.[52]

Pittsfield contains 16 brownfield sites on which hazardous substances, pollutants, or contaminants may be present, complicating future use and development; these sites cover over 50 acres of the municipality's total area of 25,900 acres (40.5 square miles).[53] In addition, Pittsfield is home to a Superfund site identified by EPA as requiring cleanup due to the presence of hazardous waste and contamination.[54] The General Electric-Pittsfield/Housatonic River Superfund site (see Figure 3 above) consists of nearly 324 acres with ten designated "Removal Action Areas"—short-term removal responses intended for cleanup due to a threat to human health[55]—associated with the operation of General Electric's Transformer, Plastics, and Ordinance Divisions.[56] In 1999, General Electric agreed to address the presence of hazardous substances, including Polychlorinated biphenyls (PCBs), in the Removal Action Areas.[57]

Allendale Elementary School, located adjacent to the General Electric Superfund site, was contaminated with PCBs when soil was taken from the Superfund site and used as fill during the school's construction in 1950. An agreement between General Electric and the City of Pittsfield allowed soil from General Electric's property to be used as fill material at the school grounds.[58] In the 1980s, local pediatricians raised concerns when PCBs were found at a construction site where the fill materials used at the school were collected.[59] Despite this warning, the Massachusetts Department of Environmental Protection failed to sample the school's soil for PCBs until the 1990s; sampling was conducted in January of 1990 and found PCBs present at the school site.[60] In 1998, almost 50 years after the Allendale Elementary School was built, EPA became involved in developing remediation solutions for the school.[61]

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[52] Parnass, L. March 2022. "If Pittsfield trash incinerator plant sale goes through it will close, which could mean you'll pay more for trash disposal." Available at: https://www.berkshireeagle.com/news/local/community-eco-power-sale-to-casella-on-tap/article_ae8c1362-a0d4-11ec-a099-2fcaa7f7a42e.html.

[53] (1) U.S. EPA. N.d. "Brownfields." Available at: https://www.epa.gov/brownfields/about; (2) Massachusetts Department of Environmental Protection (MassDEP). "Find Brownfields Sites." Available at: https://www.mass.gov/info-details/find-brownfields-sites.; (3) United States Census Bureau. N.d. "Quick Facts: Pittsfield city, Massachusetts." Available at: https://www.census.gov/quickfacts/fact/table/pittsfieldcitymassachusetts/INC110222.

[54] U.S. EPA. N.d. "Superfund." Available at: https://www.epa.gov/superfund/what-superfund.

[55] U.S. EPA. 2024. "Non-Time-Critical Removal Actions." Available at: https://www.epa.gov/superfund/non-time-critical-removal-actions

[56] U.S. EPA. June 20, 2024. "GE Plant Area of the GE-Pittsfield/Housatonic River Site." Available at: https://www.epa.gov/ge-housatonic/ge-plant-area-ge-pittsfieldhousatonic-river-site.

[57] U.S. EPA. 2009. *Revised Conceptual Removal Design/Removal Action Work Plan for Silver Lake Sediments*. Available at: https://www.epa.gov/sites/default/files/2016-10/documents/01-449572-1-pages.pdf.

[58] U.S. EPA. June 20, 2024. "GE Plant Area of the GE-Pittsfield/Housatonic River Site: Overview of the Allendale School." Available at: https://www.epa.gov/ge-housatonic/allendale-school-ge-pittsfieldhousatonic-river-site.

[59] U.S. EPA. June 20, 2024. "GE Plant Area of the GE-Pittsfield/Housatonic River Site: Overview of the Allendale School."

[60] U.S. EPA. June 20, 2024. "GE Plant Area of the GE-Pittsfield/Housatonic River Site: Overview of the Allendale School."

[61] U.S. EPA. June 20, 2024. "GE Plant Area of the GE-Pittsfield/Housatonic River Site: Overview of the Allendale School."

PCB exposure has been linked to potential carcinogenic effects, such as cancer, and non-carcinogenic effects, such as weakened immune systems, premature birth, and neurological development delays in humans.[62] The presence of PCBs in the school's soil posed a significant health risk to the children attending it as well as the teachers and other staff. By 2008, 43,000 cubic yards of contaminated soil had been removed from the school, and the site now has no restrictions on the use or handling of its soil.[63]

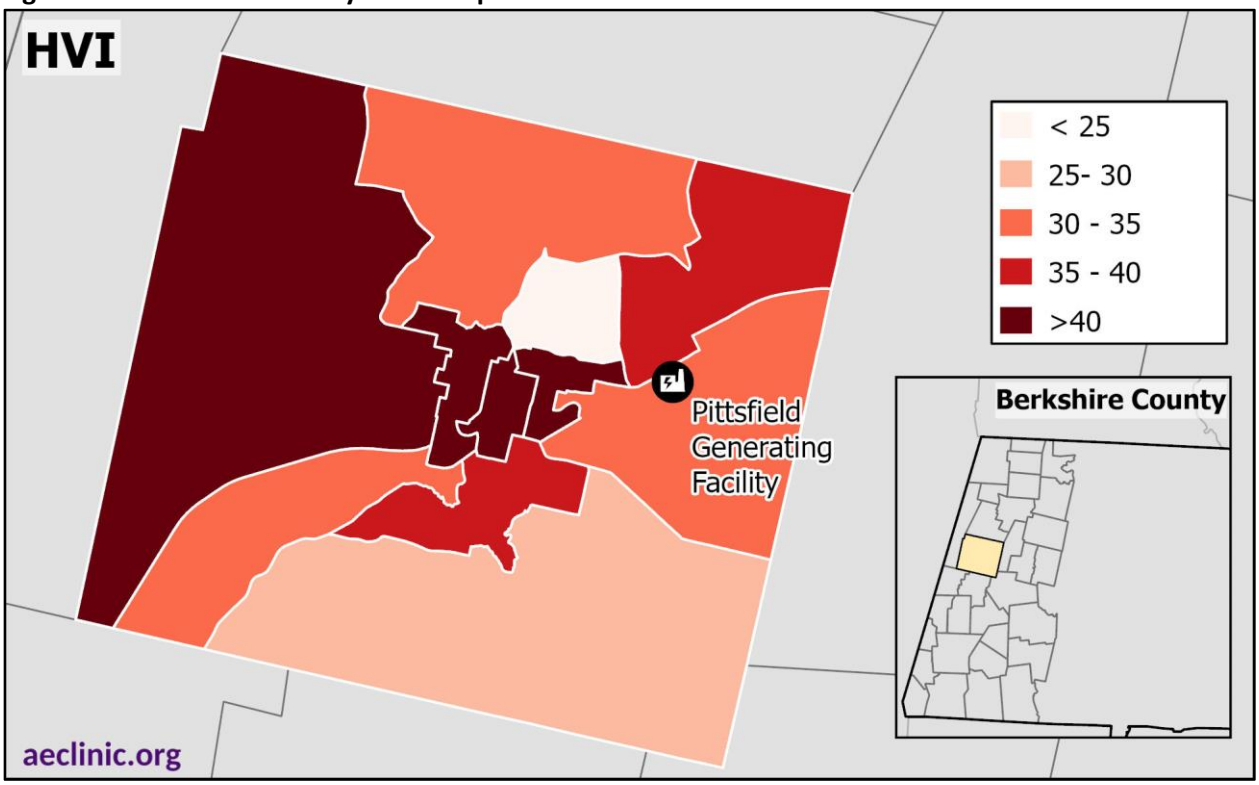
Pittsfield residents are disproportionately exposed to health risks from local pollution

Pittsfield residents face heightened health risks due to their proximity to the Pittsfield Generating Facility and other air pollution sources; census tracts in Pittsfield tend to have higher rates of pollution-related health outcomes than other tracts in Berkshire County. Tracts located in Pittsfield have the highest prevalence of asthma, chronic obstructive pulmonary disease, and stroke among the adult population compared to other census tracts in Berkshire County.[64] At the same time, they are exposed to other environmental hazards from brownfield sites and the Superfund site. The co-location of the Pittsfield Generating Facility's pollution from fossil fuel-fired generation with other environmental hazards exacerbates adverse health outcomes, particularly for socioeconomically vulnerable communities. Data from the National Center for Health Statistics show a discrepancy in life expectancy across census tracts near the power plant compared to those located farther away.[65] Individuals living in the neighborhoods of Morningside and Westside (downstream from the plant) live, on average, 10 to 12 years less than individuals living in neighborhoods in the southeastern part of the city.[66] Many Pittsfield residents face systemic barriers to healthcare access due to their lack of health insurance (see Figure 7 below)—a serious obstacle to the early detection of illnesses and a risk factor for severe illnesses.

AEC calculated a health vulnerability index (HVI) for Pittsfield, combining census tract-level data on cancer, asthma, chronic obstructive pulmonary disease, stroke, and depression prevalence, as well as a lack of health insurance. The communities in Pittsfield with the highest HVI values—those most likely to host residents overburdened by health impacts and lacking health insurance—are those closest to the Pittsfield Generating Facility (see Figure 4, where darker reds indicate greater burdens).

[62] U.S. EPA. October 17, 2024. "Learn about Polychlorinated Biphenyls." Available at: https://www.epa.gov/pcbs/learn-about-polychlorinated-biphenyls.
[63] U.S. EPA. June 20, 2024. "GE Plant Area of the GE-Pittsfield/Housatonic River Site: Overview of the Allendale School."
[64] CDC. 2022. "PLACES: Census Tract Data (GIS Friendly Format), 2024 release."
[65] National Center for Health Statistics. March 9, 2020. "Life Expectancy at Birth for U.S. States and Census Tracts, 2010-2015." Available at: https://www.cdc.gov/nchs/data-visualization/life-expectancy/index.html.
[66] National Center for Health Statistics. March 9, 2020. "Life Expectancy at Birth for U.S. States and Census Tracts, 2010-2015."

Figure 4. Health Vulnerability Index map



Data source: CDC. 2022. PLACES: Census Tract Data (GIS Friendly Format), 2024 release. Available at: https://chronicdata.cdc.gov/500-Cities-Places/PLACES-Census-Tract-Data-GIS-Friendly-Format-2024-/yjkw-uj5s/about_data.

The HVI combines values from six measures of health burdens sourced from the Center for Disease Control and Prevention's PLACES data: the shares of the population with cancer, asthma, stroke, chronic obstructive pulmonary disease (COPD), depression, and lacking health insurance (see Table 6). These measures are model-based estimates for census tracts, with the underlying data coming from the 2021/2022 Behavioral Risk Factor Surveillance System, 2010 Census Bureau population estimates, and the 2015-2019 American Community Survey.[67] For each census tract, population shares for the six health measures are converted into six component indices, each with values ranging from 0 to 100/6 (or 16.7), where a higher score indicates a greater degree of vulnerability. The HVI is calculated as the sum of these component indices.

[67] Center for Disease Control. 2022. "PLACES: Census Tract Data (GIS Friendly Format), 2024 release." Available at: https://chronicdata.cdc.gov/500-Cities-Places/PLACES-Census-Tract-Data-GIS-Friendly-Format-2024-/yjkw-uj5s/about_data.

Table 6. HVI components

Component	Description	Maximum Value
Cancer prevalence	The share of the adult population with non-skin cancer or melanoma.	16.7%
Asthma prevalence	The share of the adult population that currently has asthma.	16.7%
Stroke prevalence	The share of the adult population experiencing strokes.	16.7%
COPD prevalence	The share of the adult population with chronic obstructive pulmonary disease among adults.	16.7%
Depression prevalence	The share of the adult population experiencing frequent mental distress.	16.7%
Lack of health insurance	The share of the population between the ages of 18 and 64 that lack health insurance.	16.7%
Health vulnerability index	The sum of component indicies for each health measure.	100%

Data source: CDC. 2022. PLACES: Census Tract Data (GIS Friendly Format), 2024 release. Available at: https://chronicdata.cdc.gov/500-Cities-Places/PLACES-Census-Tract-Data-GIS-Friendly-Format-2024-/yjkw-uj5s/about_data.

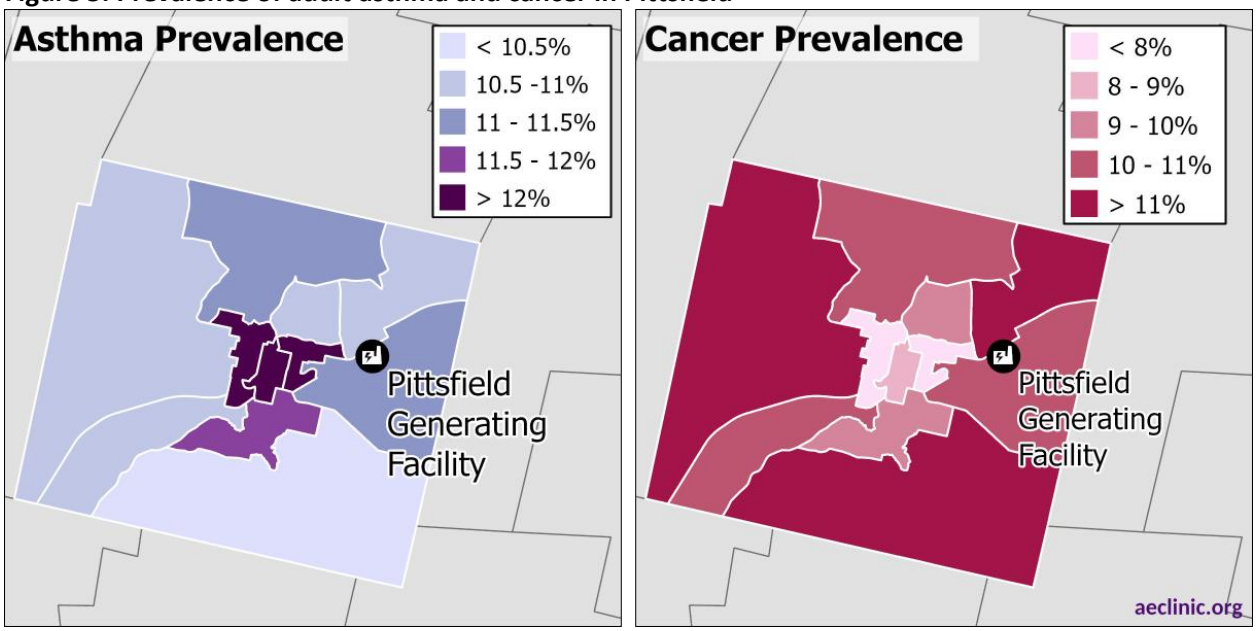
Across Pittsfield, the share of the adult population with asthma ranges from 10.4 percent to 13.3 percent by census tract (see Figure 5 below). The census tract average across Massachusetts is 10.6 percent. Tracts located in the center of Pittsfield (west of the Pittsfield Generating Facility and the Superfund site) have the greatest share of adults with asthma; 12 percent or more of the adult population in these tracts have asthma. In contrast, the tracts lining a portion of the border of Pittsfield have the highest share of the population with cancer. The share of the adult population by tract with cancer across the municipality ranges from 6.9 percent to 12.4 percent, whereas the average in Massachusetts is 7.5 percent.

The share of the adult population experiencing strokes or having COPD is highest in the tracts located in the center of Pittsfield—west of the Pittsfield Generating Facility and the Superfund site (see Figure 6 below). The share of the adult population experiencing incidence of stroke ranges from 10.5 percent to 21.5 percent by tract, whereas the average in Massachusetts is 12.9 percent. The share of the adult population experiencing COPD ranges from 8.7 percent to 21.5 percent by tract, compared to the Massachusetts average of 10.6 percent.

In Pittsfield, the share of adults experiencing poor mental health ranges from 31.6 percent to 37.4 percent by tract, compared to the Massachusetts average of 31.2 percent (see Figure 7 below). Four of the census tracts in Pittsfield are within the category greater than 35 percent (reaching as high as 37.4 percent), one of which is within 0.1 miles of Pittsfield Generating Facility. The share of Pittsfield's uninsured population is highest in the center, with more than 4.5 percent of the population in those tracts lacking health insurance. Across Pittsfield, the share of uninsured adults ranges from 2.6 percent to 6.9 percent by tract, and in Massachusetts, the average is 4.1 percent.

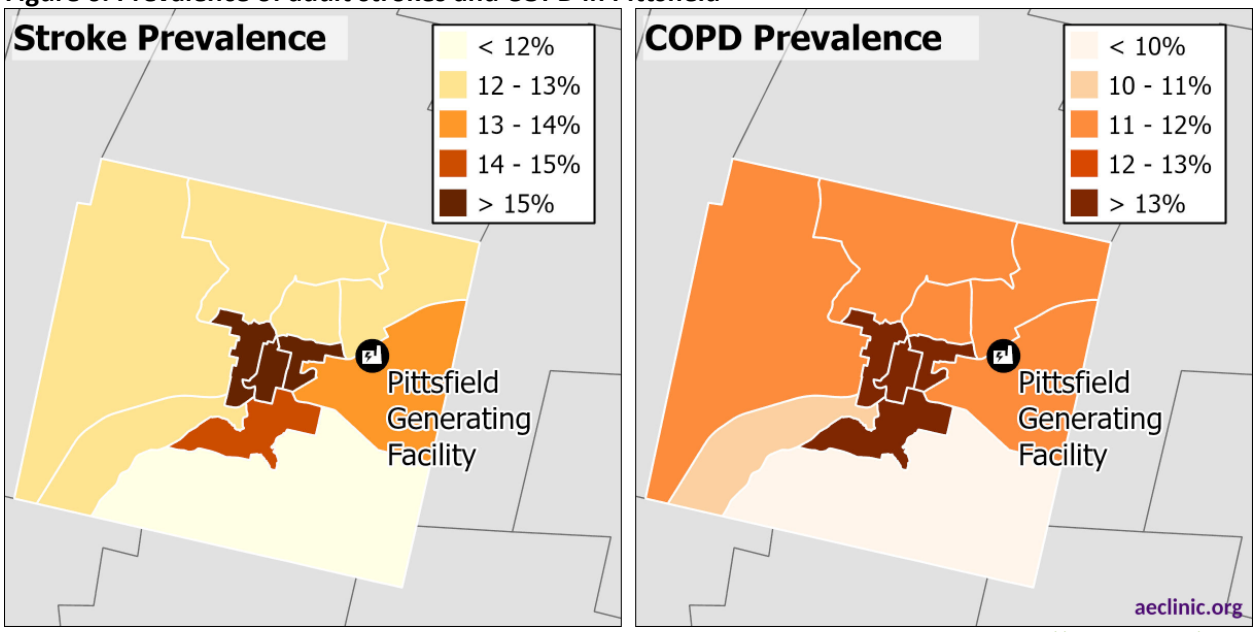
To avoid exacerbating existing health conditions from exposure to emissions from fossil fuel-fired peaker plants, some communities have pushed for alternative, cleaner energy resources, like solar, wind or energy storage facilities.

Figure 5. Prevalence of adult asthma and cancer in Pittsfield



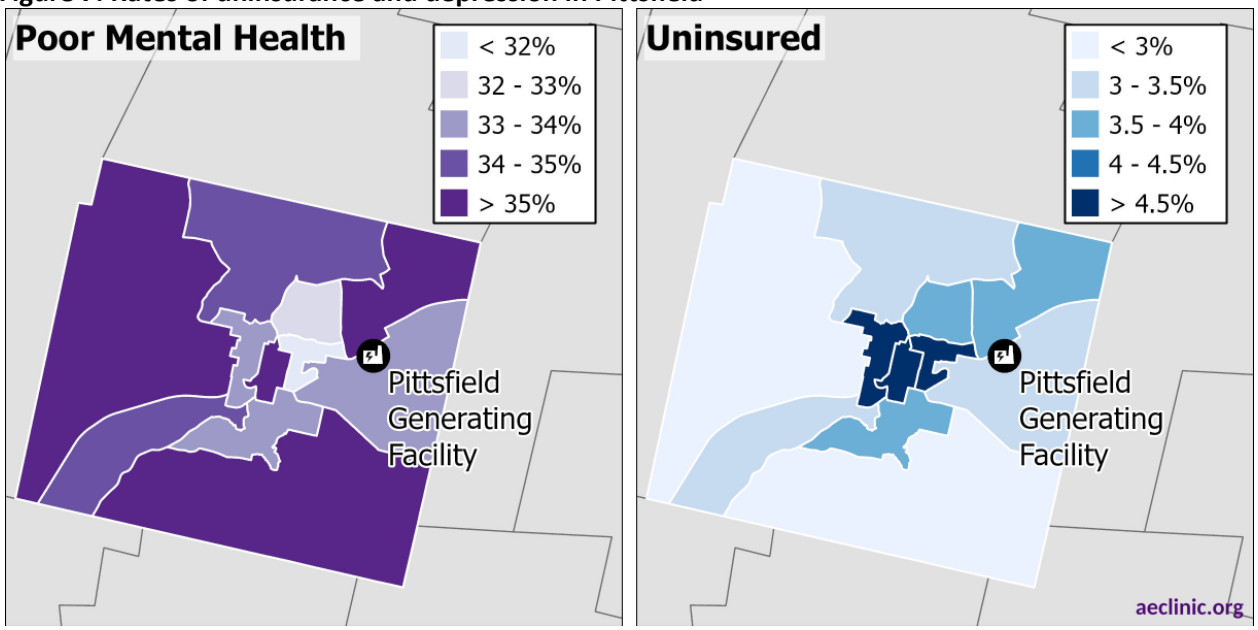
Data source: CDC. 2024. PLACES: Census Tract Data (GIS Friendly Format), 2024 release. Available at: https://data.cdc.gov/500-Cities-Places/PLACES-Census-Tract-Data-GIS-Friendly-Format-2024-/yjkw-uj5s/about_data.

Figure 6. Prevalence of adult strokes and COPD in Pittsfield



Data source: CDC. 2024. PLACES: Census Tract Data (GIS Friendly Format), 2024 release. Available at: https://data.cdc.gov/500-Cities-Places/PLACES-Census-Tract-Data-GIS-Friendly-Format-2024-/yjkw-uj5s/about_data.

Figure 7. Rates of uninsurance and depression in Pittsfield



Data source: CDC. 2024. PLACES: Census Tract Data (GIS Friendly Format), 2024 release. Available at: https://data.cdc.gov/500-Cities-Places/PLACES-Census-Tract-Data-GIS-Friendly-Format-2024-/yjkw-uj5s/about_data.

IV. Alternative Energy Sources

Replacing fossil-fuel plants like the Pittsfield Generating Facility with clean energy resources can help reduce negative health impacts from air pollution. For example, a 2018 Environmental Impact Statement (EIS) of the *New York State Energy Storage Roadmap* (released by the New York State Department of Public Service (NYSDPS) and New York State Energy Research & Development Authority (NYSERDA)) identified the potential health benefits of deploying battery storage to replace peaker plants.[68] Battery storage, for example, can be used to collect energy at times of low demand and be discharged back to the grid during peak demand, reducing the need for fossil fuel-fired peaker plants to run during peak demand. The EIS identified avoided emissions of greenhouse gases and criteria air pollutants, as well as a reduction of state health care expenditures due to reduced treatments of asthma, bronchitis, and respiratory conditions as potential public health benefits of the Roadmap.[69] In addition, the EIS identified benefits to New York's energy system, such as improved power quality and reliable delivery, better use of existing equipment, and improved reliability of electric transmission and distribution systems.[70]

Reducing reliance on fossil fuel-fired electricity can help prevent climate change impacts

[68] Industrial Economics, Incorporated. 2018. *Final Generic Environmental Impact Statement CASE 18-E-0130 – In the Matter of Energy Storage Deployment Program*. Prepared for New York State Department of Public Service and New York State Energy Research & Development Authority. Available at: https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterSeq=55960.
[69] Ibid. p. 21.
[70] Ibid. p. 21.

Fossil fuel plants themselves can spur reduced reliability of electric transmission by contributing to greenhouse gas emissions and the resultant impacts of climate change. NYSDPS's and NYSERDA's EIS found that replacing fossil fuel-fired generation with clean energy resources can aid in the prevention of climate change-caused extreme weather that is increasingly exacerbating grid disruptions.[71] The EIS suggests that reducing reliance on fossil fuels for energy generation would help prevent increases in the frequency of extreme precipitation and extreme heat events in New York, as well as increases in the incidence of local and coastal flooding and preventing longer summer dry periods.[72]

Clean energy resources reduce both local and global pollutants, benefiting communities in Pittsfield and areas around the world. A 2018 California based study found that retiring coal- and oil-fired power plants is associated with a reduced likelihood of preterm births for women within 6 miles of the power plants.[73] In 2024, Pennsylvania State University researchers found that retiring coal plants in Pennsylvania would reduce PM pollution and, in turn, decrease the number of deaths attributed to PM exposure in the Commonwealth.[74] Similar analysis of Virginia modeled the health impacts of decarbonizing the power sector—based on the Virginia Clean Economy Act—and found co-benefits, including avoided deaths, reduced hospital emissions from respiratory and cardiovascular-related issues, and fewer lost work days.[75]

Across the United States, the transition to clean energy resources is underway

Across the country, a transition from fossil fuel-fired generation to clean energy resources has begun. AEC's 2024 report, *Insights from Fossil Fuel Replacement Case Studies*, prepared on behalf of the Berkshire Environmental Action Team, examines case studies of fossil fuel-fired peakers transitioning to clean energy across the country.[76] These case studies provide insight into important pathways for achieving the Commonwealth's electric sector emissions limits. In Preston, Connecticut, the Tunnel Jet Peaking Facility

[71] (1) Industrial Economics, Incorporated. 2018. *Final Generic Environmental Impact Statement CASE 18-E-0130 – In the Matter of Energy Storage Deployment Program*. Prepared for New York State Department of Public Service and New York State Energy Research & Development Authority. p. 21; (2) Klass, A., Macey, J., Welton, S., & Wiseman, H. May 2022. Grid Reliability Through Clean Energy. *Stanford Law Review, Volume 74.* Available at: https://review.law.stanford.edu/wp-content/uploads/sites/3/2022/05/Klass-et-al.-74-Stan.-L.-Rev.-969.pdf, p. 987

[72] Industrial Economics, Incorporated. 2018. *Final Generic Environmental Impact Statement CASE 18-E-0130 – In the Matter of Energy Storage Deployment Program*. Prepared for New York State Department of Public Service and New York State Energy Research & Development Authority. p. 21.

[73] Casey, J., Karasek, D., Ogburn, E., Goin, D., Dang, K., Braveman, P., & Morello-Frosch, R. 2018. "Retirements of coal and oil power plants in California: association with reduced preterm birth among populations nearby." *American Journal of Epidemiology*, *187*(8), 1586-1594. Available at: https://academic.oup.com/aje/article/187/8/1586/4996680.

[74] Campos Morales, C., Pakhtigian, E., Landry, J., Wiseman, H., Pham, A., & Peng, W. 2024. "Designing Retirement Strategies for Coal-Fired Power Plants To Mitigate Air Pollution and Health Impacts." *Environmental Science & Technology*, *58*(35), 15371-15380. Available at: https://pubs.acs.org/doi/10.1021/acs.est.4c00704.

[75] Ortiz, L., Stiles, R., Whitaker, S., Maibach, E., Kinter, J., Henneman, L., Kral, J., Bubbosh, P., & Cash, B. 2023. "Public health benefits of zero-emission electric power generation in Virginia." *Heliyon*, *9*(9). Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC10559951/.

[76] Burt, J., Seliga, E., Stasiso, T., McNamee, L., & Stanton, E. 2024. *Insights from Fossil Fuel Replacement Case Studies*. Applied Economics Clinic. Available at: https://aeclinic.org/publicationpages/12/2024/insights-from-fossil-fuel-replacement-case-studies.

hosted a 17-MW kerosene-fired turbine.[77] Following its decommissioning in 2023, the plant is being replaced with a 17-MW battery energy storage system co-located at FirstLight's Tunnel Hydro facility on the Quinebaug River.[78] The Arthur Kill Power Station in Staten Island, New York, is currently undergoing a solar and storage conversion for one of its units.[79] Other plants not included among the case studies in AEC's report but undergoing similar transitions include the Kincaid Power Plant in South Fork Township, Illinois, undergoing battery and solar replacement, and the Sherburne County Coal Generator in Becker, Minnesota, which is in the process of being replaced by new solar generation.[80]

This fossil fuel to clean energy transition is also underway at facilities across Massachusetts. The West Springfield Generation Station, previously operated as a 352 MW gas-fired plant, is undergoing an $80 million redevelopment project featuring 45 MW of battery storage, expected to begin operation in 2025.[81] The retired Salem Harbor Station coal- and oil-fired power plant is set to be redeveloped as the Salem Offshore Wind Terminal in service of the offshore wind industry.[82] In Western Massachusetts, the site of the former coal-fired Mount Tom Power Plant has become the Mount Tom Solar Farm, a 5.7-MW solar project completed in 2017.[83]

Replacing the Pittsfield Generating Facility with clean energy will aid the Commonwealth in achieving its emissions reduction limits

In 2022, the Commonwealth released its *Clean Energy and Climate Plan for 2050* (CECP 2050), describing

[77] (1) Murray, C. October 13, 2022. "FirstLight Power to replace Connecticut peaker plant with 17MW battery energy storage system." Available at: https://www.energy-storage.news/firstlight-power-to-replace-connecticut-peaker-plant-with-17mw-battery-energy-storage-system/; (2) Crowley, B. October 13, 2022. "FirstLight to Retire Kerosene-Fired Turbine, Plans Hydro-Powered Battery Replacement in Preston." CT Examiner. Available at: https://ctexaminer.com/2022/10/13/firstlight-to-retire-kerosene-fired-turbine-plans-hydro-powered-battery-replacement-in-preston/.

[78] Murray, C. October 13, 2022. "FirstLight Power to replace Connecticut peaker plant with 17MW battery energy storage system."

[79] Jones-Gorman, J. June 1, 2024. "'Largest' battery storage site in NYC will soon rise in this Staten Island neighborhood." SI Live. Available at: https://www.silive.com/news/2024/06/largest-battery-storage-site-in-nyc-will-soon-rise-in-this-staten-island-neighborhood.html;

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Massachusetts' plan to meet net-zero emissions by 2050.[84] To achieve this goal, the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) established emissions sublimits by economic sector; the electric power sector is required to reduce emissions 93 percent from 1990 levels by 2050, corresponding to an emissions limit of 2 million MT CO_2e.[85] In addition, the Commonwealth's *Clean Energy and Climate Plan for 2025 and 2030* (CECP 2025/2030) sets out short-term actionable strategies that Massachusetts plans to employ to achieve a 33 percent reduction in statewide emissions by 2025 and a 50 percent reduction by 2030 (from 1990 levels).[86] The CECP 2025/2030 outlines pathways for achieving a 53 percent reduction by 2025 and a 70 percent reduction by 2030 for the electric sector established by the EEA.[87]

Replacing fossil-fuel peakers with clean energy or storage resources is a key strategy for the Commonwealth in achieving its emissions reduction goals. The Massachusetts Office of Energy Transformation (OET) lists decarbonization of peak electric demand as a key focus area and has established a working group composed of utilities, fossil fuel workers, business groups, technology providers and innovators, and environmental justice advocates to identify pathways for reducing reliance on fossil fuel-fired peaker plants.[88] Replacing the Pittsfield Generating Facility with renewable energy or storage technology can help reduce peak demand and peak emissions, and aid in meeting the Commonwealth's overall decarbonization goals for the electric sector.

V. Key Takeaways

More frequent operation of the Pittsfield Generating Facility in the future would increase greenhouse gas emissions and local air pollution that would exacerbate the negative health outcomes of overburdened residents. This concern leads to three key takeaways (see Table 7). First, as long as the Pittsfield Generating Facility is in operation, it has the potential to produce much higher greenhouse gas emissions and co-pollutants in any given year. Second, Pittsfield's EJ and other vulnerable populations live in close proximity to the facility, putting them at a disproportionate risk for the negative health impacts associated with fossil fuel-fired generation. Lastly, replacing the facility with clean energy resources can not only improve the health outcomes for residents, but also aid the Commonwealth in achieving its decarbonization goals.

[84] Massachusetts Executive Office of Energy and Environmental Affairs. 2022. *Clean Energy and Climate Plan for 2050*. Available at: https://www.mass.gov/doc/2050-clean-energy-and-climate-plan/download.
[85] Ibid. p. 19.
[86] Massachusetts Executive Office of Energy and Environmental Affairs. 2022. Clean Energy and Climate Plan for 2025 and 2030. Available at: https://www.mass.gov/doc/clean-energy-and-climate-plan-for-2025-and-2030/download.
[87] Ibid. p. 63.
[88] (1) Massachusetts Office of Energy Transformation (OET). N.d. "Focus Areas." Available at: https://www.mass.gov/orgs/office-of-energy-transformation; (2) Massachusetts OET. July 7, 2024. "Healey-Driscoll Office of Energy Transformation Announces Advisory Board and Focus on Peaker Plants, Everett LNG Terminal, and Affordability." Available at: https://www.mass.gov/news/healey-driscoll-office-of-energy-transformation-announces-advisory-board-and-focus-on-peaker-plants-everett-lng-terminal-and-affordability.

Table 7. Key takeaways

Key Takeaway #1: As long as the Pittsfield Generating Facility is in operation, it has the potential to produce much higher greenhouse gas emissions and co-pollutants in any given year.
Key Takeaway #2: EJ and other vulnerable communities live in close proximity to the Pittsfield Generating Facility, increasing vulnerability to adverse health outcomes.
Key Takeaway #3: Replacing the fossil fuel-fired plant with clean energy resources can reduce emissions in the area.

Key Takeaway #1: As long as the Pittsfield Generating Facility is in operation, it has the potential to produce much higher greenhouse gas emissions and co-pollutants in any given year.

The Pittsfield Generating Facility operates as a peaker plant, meaning it operates only during times of high electric demand. Despite its limited use, the plant is subject to both federal and state emissions regulations. In recent years, the plant experienced a downward trend in operation and emissions. However, in the first 11 months of 2024 emissions from the plant rose to 15,900 MT of CO_2e, nearly 5,400 metric tons more than released in all of 2023.[89] In 2024, the plant operated with a capacity factor of 3.6 percent, but the plant has the potential to run more frequently; in 2018 the plant operated with a capacity factor of 7.7 percent and produced nearly 59,000 MT of CO_2e, highlighting the potential the plant has to increase emissions if called to operate more frequently in the future.[90]

Key Takeaway #2: EJ and other vulnerable communities live in close proximity to the Pittsfield Generating Facility, increasing vulnerability to adverse health outcomes.

Low-income, BIPOC populations, older adults, and children are disproportionately at risk for negative health outcomes associated with pollution because they are more likely to live in areas with greater susceptibility to environmental hazards, among other factors.[91] The EPA uses a 3-mile radius to assess the potential impacts of emissions on local communities.[92] Within just two miles of the plant live many vulnerable populations that may experience negative health impacts from the plant's operations. Our analysis shows that residents living in census tracts near the plant face some of the highest shares of pollution-related health outcomes in the City.

Compared to other Berkshire County municipalities, Pittsfield residents have higher rates of pollution-related health outcomes and greater shares of low-income and BIPOC populations. Multiple K-12 schools, senior centers, senior living facilities, and EJ communities are located close by to the Facility. The school in closest proximity, Allendale Elementary, is adjacent to the Pittsfield Generating Facility, placing students, teachers, and staff at risk for adverse health outcomes.

Key Takeaway #3: Replacing the fossil fuel-fired plant with clean energy resources can

[89] U.S. EIA. 2018-2023. *Form EIA-923*.
[90] Ibid.
[91] U.S. EPA. N.d. "Climate Change and the Health of Socially Vulnerable People."
[92] U.S. EPA. N.d. "Power Plants and Neighboring Communities."

reduce local air emissions as well as greenhouse gas emissions.

Replacing fossil-fuel power plants with clean energy improves health outcomes for community members and reduces the burdens created by the co-location of polluting facilities and environmental hazards. Pittsfield residents are exposed not only to air pollution from the Pittsfield Generating Facility, but also the residual effects of long-term exposure to two recently retired power plants located nearby. In addition, Pittsfield hosts multiple brownfield and Superfund sites, placing further burden on residents and workers. Replacing the Pittsfield Generating Facility with clean energy resources would not only reduce local air emissions and aid in improving health outcomes for Pittsfield residents, but also would reduce the number of co-located hazards and polluting facilities in the area. This type of clean energy replacement is practical and viable, with examples already in process at several former power plants around the Commonwealth.