United States Court of Appeals
For the First Circuit

No. 21-1131

CITY OF QUINCY, MASSACHUSETTS; TOWN OF HINGHAM, MASSACHUSETTS; TOWN OF BRAINTREE, MASSACHUSETTS; DOROTHY ANDERSON; ALICE ARENA; MARGARET BELLAFIORE; WENDY CULLIVAN; SUSAN GREENE; ANDREA HONORE; MICHAEL LANG; CURTIS NORDGAARD, M.D.; THOMAS PENDERGAST; JUDY ROBERTS; BETSY SOWERS; BERNADETTE WILSON; KENNETH J. DIFAZIO; JANE HACKETT, Councilor at Large; ED HARRINGTON, District Five Councilor; REBECCA HAUGH; GEORGE LORING; ARTHUR MATHEWS; PATRICK M. O'CONNOR; FRANK SINGLETON; THOMAS TANNER,

Petitioners,

v.

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION,

Respondent,

ALGONQUIN GAS TRANSMISSION, LLC,

Intervenor.

PETITION FOR REVIEW OF AN ORDER OF
THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

Before

Thompson, Lipez, and Kayatta,
Circuit Judges.

Michael H. Hayden, with whom Morrison Mahoney LLP, Nicole I. Taub and Crystal Huff, Office of the Town Solicitor, Town of Braintree, Kerry T. Ryan, and Bogle, DeAscentis & Coughlin, P.C., were on brief, for petitioner.

Seth Schofield, Senior Appellate Counsel, Office of the Attorney General of Massachusetts, with whom Maura Healey,

Attorney General for the Commonwealth of Massachusetts, was on brief, for respondent.

Jeremy C. Marwell, with whom Joshua S. Johnson and Vinson & Elkins LLP were on brief, for intervenor.

December 17, 2021

KAYATTA, Circuit Judge. The City of Quincy, the Towns of Braintree and Hingham, and a group of citizens (collectively, "the City") challenge the final decision of the Massachusetts Department of Environmental Protection (DEP) reaffirming the issuance of an air permit to Algonquin Gas Transmission, LLC (Algonquin) for a natural gas compressor station located in Weymouth, Massachusetts. DEP had previously approved Algonquin's plans to power the Weymouth station using a natural-gas-fired turbine, which emits some amount of nitrogen oxides (NO_x). The City and other petitioners convinced this court in a prior appeal that DEP did not follow its own established procedures when it eliminated an electric motor as a possible alternative to the gas-fired turbine. See Town of Weymouth v. Mass. Dep't of Env't Prot., 961 F.3d 34 (1st Cir.), modified on reh'g, 973 F.3d 143 (1st Cir. 2020). We remanded to DEP to assess whether an electric motor was in fact what Massachusetts regulations call the "best available control technology" (BACT) for the new station. After holding a hearing and considering additional record evidence, DEP again concluded that an electric motor was not BACT for the Weymouth compressor station and reaffirmed Algonquin's air permit. Satisfied that the agency's actions on remand were not arbitrary and capricious, we now deny the City's petition for further review and affirm DEP's decision after remand.

I.

Our opinion in Town of Weymouth recounts the factual background and circumstances leading up to the proceedings on remand that form the basis of this petition. See 961 F.3d at 38–41. We repeat only the essential details, beginning with a brief description of the applicable regulatory framework.

A.

Pursuant to the Natural Gas Act (NGA), 15 U.S.C. § 717 et seq., the Federal Energy Regulatory Commission (FERC) oversees the certification of interstate natural gas pipeline projects. As part of FERC's review of proposed pipelines, the agency must ensure that each project complies with all relevant federal permitting requirements, including those under the federal Clean Air Act (CAA), 42 U.S.C. § 7401 et seq. See 15 U.S.C. § 717b(d)(2). Congress expressly reserved in the NGA the rights of states to issue or deny permits under the CAA for interstate natural gas projects. See id. (providing that the NGA does not "affect[] the rights of States under . . . the Clean Air Act"); see also Town of Weymouth, 961 F.3d at 39.

For its part, the CAA embraces a "cooperative federalism" approach "such that DEP, in enforcing the Massachusetts CAA, is in fact acting pursuant to the federal CAA." Town of Weymouth, 961 F.3d at 40 n.4; see also id. at 39 n.2. Under its authority, DEP has issued comprehensive regulations

governing the control of air pollutants, including regulations regarding the issuance of air permits for stationary sources of air pollution like the Weymouth compressor station at issue in this appeal. See 310 Mass. Code Regs. § 7.02.

In order to obtain an air permit from DEP, an applicant must show that the proposed facility employs the "best available control technology" for each regulated air pollutant, including NO_x. Id. § 7.02(8)(a)(2); see also Town of Weymouth, 961 F.3d at 41. BACT is defined as "an emission limitation based on the maximum degree of reduction of any regulated air contaminant emitted from or which results from any regulated facility" that DEP "determines is achievable for such facility through application of production processes and available methods, systems and techniques for control of each such contaminant." 310 Mass. Code Regs. § 7.00; see also 42 U.S.C. § 7479(3). Simply put, BACT is the most effective emissions control technology for a pollutant that is technologically and economically feasible for the given project.

The Environmental Protection Agency (EPA) has developed a five-step, "top-down" process for determining BACT. See EPA, New Source Review Workshop Manual: Prevention of Significant Deterioration and Nonattainment Area Permitting B.5–B.6 (1990), https://www.epa.gov/sites/default/files/2015-

07/documents/1990wman.pdf [hereinafter NSR Workshop Manual]. The five steps are as follows:

- **Step 1:** The applicant identifies and lists all available control technologies that have "a practical potential for application to the emissions unit and the regulated pollutant under evaluation." Id. at B.5. However, a control technology may be excluded at Step 1 of the BACT analysis if it would "redefine the source." Helping Hand Tools v. EPA, 848 F.3d 1185, 1194 (9th Cir. 2016); see also Town of Weymouth, 961 F.3d at 43.[1]
- **Step 2:** The applicant eliminates any "technically infeasible options" from the list generated at Step 1. NSR Workshop Manual, supra, at B.7.[2]
- **Step 3:** The applicant "rank[s]" the "remaining control alternatives not eliminated in [S]tep 2" based on their

[1] A control alternative "redefines the source" and is properly excluded from the BACT analysis if using the technology essentially "requires a complete redesign of the facility." Helping Hand Tools, 848 F.3d at 1194. As a "classic" example, "a coal-burning power plant need not consider a nuclear fuel option as a 'cleaner' fuel because it would require a complete redesign of the coal-burning power-plant." Id. (citing Sierra Club v. EPA, 499 F.3d 653, 655 (7th Cir. 2007)); see also NSR Workshop Manual, supra, at B.13–B.14.

[2] A control option is "technically infeasible" if, "based on physical, chemical, and engineering principles, . . . technical difficulties would preclude the successful use of the control option on the emissions unit under review." Id.

effectiveness in reducing controlled pollutant emissions. Id. at B.7–B.8.

- **Step 4:** The applicant evaluates "the energy, environmental, and economic impacts" of each control option and eliminates any controls that do not meet certain effectiveness criteria. Id. at B.8–B.9.
- **Step 5:** The "most effective control option" that has not been eliminated is selected as BACT. Id. at B.9.

DEP has adopted EPA's five-step approach for BACT analysis in its guidance, which incorporates the NSR Workshop Manual by reference. See DEP, Best Available Control Technology (BACT) Guidance: Air Pollution Control Requirements for Construction, Substantial Reconstruction or Alteration of Facilities that Emit Air Contaminants 3 (2011), https://www.mass.gov/files/documents/2016/08/oo/bactguid.pdf [hereinafter DEP BACT Guidance]. An applicant for an air permit must submit a BACT assessment to DEP, which the agency independently reviews before making a final determination with respect to BACT. See id. at 1; see also 310 Mass. Code Regs. § 7.02(8)(a)(2). DEP assesses BACT "on a case-by-case basis taking into account energy, environmental, and economic impacts and other costs." 310 Mass. Code Regs. § 7.00.

B.

In 2015, Algonquin, a natural gas transmission company, proposed to construct and operate the Atlantic Bridge Project, an infrastructure project designed to deliver natural gas to the northeastern United States. As part of the project, Algonquin sought to build several natural gas compression facilities, including the compressor station in Weymouth. Compressor stations are necessary for the delivery of natural gas through the Atlantic Bridge Project pipeline because they increase the system pressure inside the pipeline to ensure that gas flow remains at the required rates. See Town of Weymouth, 961 F.3d at 38–39. A compressor station is powered by a "driver," which can include, among other things, a gas-fired turbine or an electric motor.

For the Weymouth compressor station, Algonquin proposed to use a "SoLoNOx" Solar Taurus 60 natural-gas-fired combustion turbine as the station's driver. The basic idea is that the Weymouth compressor station, which is co-located with the pipeline, burns a small amount of the natural gas in the pipeline as fuel in order to generate the pressure necessary to allow the rest of the gas to flow through the pipeline to its ultimate destinations. See id. at 39. However, because the SoLoNOx turbine burns natural gas, it emits NO_x, an air pollutant covered by federal

and Massachusetts state environmental regulations.[3] An electric motor does not emit NO_x.

Initially, Algonquin's air permit application did not assess whether an electric motor, rather than the gas-fired SoLoNOx turbine, was BACT. Id. at 42. But after nearby municipalities and citizen groups, including the City, raised the potential of an electric motor as an alternative to the SoLoNOx turbine, Algonquin revised its application to account for the electric motor option. Algonquin's assessment of the electric motor proposed several reasons for excluding it from the BACT analysis, including the high costs of installing and operating an electric motor. Crucially, however, Algonquin did not submit a detailed BACT analysis evaluating the electric motor option in its revised application. Nonetheless, DEP accepted Algonquin's exclusion of the electric motor without conducting its own independent BACT analysis. See id. DEP subsequently issued an air permit for the Weymouth station in January 2019, approving Algonquin's proposal to use the SoLoNOx turbine.

Unhappy with the decision, the same group of municipalities and citizen groups filed an administrative appeal, raising, among other things, DEP's failure to consider an electric

[3] The SoLoNOx is a proprietary model of dry low NO_x turbine, which is designed to reduce, although not eliminate, NO_x emissions by operating as a lower combustion temperature.

motor as BACT. See id. at 40. As relevant to that issue, Algonquin and DEP argued to the Presiding Officer of the appeal that an electric motor could be eliminated at Step 1 of the BACT analysis because it would involve a complete redesign of the Weymouth station project. Id. at 42–43. The Presiding Officer was unpersuaded by this argument, at least as then presented. Id. at 43. Instead, the Presiding Officer found that an electric motor would not be cost-effective for the Weymouth station because it would require substantial infrastructure investment and, therefore, was excludable at Step 4 of the BACT analysis. Id. Accordingly, on the Presiding Officer's recommendation, DEP's Commissioner affirmed the issuance of the Weymouth station air permit. These prior administrative proceedings culminated in a petition for review before this court and our decision in Town of Weymouth. In that opinion, we held that DEP's decision to exclude an electric motor as not BACT without performing the cost-effectiveness calculations required by the agency's established procedures was arbitrary and capricious. See id. at 47. We therefore remanded to DEP to redo the BACT analysis.[4] Id. at 59.

[4] In our initial opinion, we also vacated the grant of the air permit for the Weymouth compressor station. See Town of Weymouth, 961 F.3d at 58–59. However, after a panel rehearing, we revised our opinion to reflect that the remedy granted was remand without vacating the air permit. Town of Weymouth v. Mass. Dep't of Env't Prot., 973 F.3d 143, 145 (1st Cir. 2020).

On remand, Algonquin submitted a detailed technical addendum to its air permit application laying out a more extensive BACT analysis. Algonquin concluded that an electric motor could be excluded at either Step 1 (because it would redefine the source) or Step 4 (because it was not cost-effective). DEP's Regional Office agreed with Algonquin's analyses and reaffirmed its prior BACT determination. The City and other interested parties again requested an adjudicatory hearing before DEP's Office of Appeals and Dispute Resolution and submitted its own testimony, including a BACT analysis conducted by its expert Dr. Ranajit Sahu. Dr. Sahu concluded that an electric motor was BACT because it would not redefine the source at Step 1 and would be cost-effective at Step 4.

On January 11, 2021, after holding a hearing and considering additional filings from the parties, the Presiding Officer for the matter issued a "Recommended Final Decision After Remand," finding that DEP properly determined that an electric motor is not BACT and recommending that DEP's Commissioner reaffirm the air permit for the Weymouth compressor station. The Presiding Officer found that an electric motor could be excluded either at Step 1 of the BACT analysis because it would redefine the source or at Step 4 of the BACT analysis because it was not a cost-effective control. The Commissioner issued a "Final Decision After Remand" on January 19, 2021, adopting the Presiding Officer's

recommendations. The Commissioner noted in his decision that the exclusion of an electric motor at Step 1 and Step 4 provided "independent bases for affirming the air permit."

The City now challenges DEP's decision after remand to reaffirm the air permit for the Weymouth compressor station. As it did before, Algonquin intervened as a respondent. See Town of Weymouth, 961 F.3d at 41. We have original jurisdiction over this petition for review under the NGA. Id. at 40–41; 15 U.S.C. § 717r(d)(1).

II.

As we noted in Town of Weymouth, the NGA does not provide a standard of review for a state agency's final permitting decisions. See 961 F.3d at 41. The City and DEP previously maintained differing positions as to whether the federal Administrative Procedure Act or instead the Massachusetts Administrative Procedure Act should apply, but as we explained before, the standards do not vary materially, at least with respect to this case. See id. The parties do not now raise any objections to this approach. Thus, as before, we will review formally adjudicated findings of fact for "substantial evidence," and reverse agency decisions if they are "arbitrary and capricious." Id.

III.

A.

We begin our analysis of the merits of the City's petition with the City's principal claim: that DEP's exclusion of an electric motor as not BACT was arbitrary and capricious. There is no dispute that an electric motor would be technically feasible at Step 2 and would be ranked higher in control effectiveness than the SoLoNOx turbine at Step 3. So, if the City is correct that an electric motor survives exclusion in both Step 1 and Step 4, an electric motor should be selected as BACT at Step 5. If, however, we conclude that DEP reasonably eliminated an electric motor at either Step 1 or Step 4, we will affirm DEP's determination that an electric motor is not BACT. As we will explain in more detail below, because we conclude that DEP did not act arbitrarily and capriciously when it eliminated an electric motor at Step 4 of the BACT analysis, we need not resolve the parties' disagreement as to Step 1.

At Step 4, DEP assesses, among other things, the "economic impacts" of the control alternatives remaining after Step 3. NSR Workshop Manual, supra, at B.26. The economic feasibility of a control option is measured by the technology's cost-effectiveness at reducing emissions of regulated pollutants -- with effectiveness "measured in terms of tons of pollutant emissions removed" and cost "measured in terms of annualized

control costs." Id. at B.36; see also DEP BACT Guidance, supra, at 4. Agency guidance explains that "[c]ost effectiveness calculations can be conducted on an average[] or incremental basis." NSR Workshop Manual, supra, at B.36. Here, DEP and Algonquin assessed the average cost-effectiveness of an electric motor in its BACT analysis.

According to the NSR Workshop Manual, average cost-effectiveness, which measures the dollar value of each ton of pollutant removed, is calculated as:

> control option annualized cost / (baseline emissions rate - control option emissions rate)

Id. at B.37 (mathematical notations reformatted).

The numerator, the annualized cost of the control option, is "the capital cost of the control technology or technique amortized over its expected lifetime, plus annual operating and maintenance costs." DEP BACT Guidance, supra, at 4. To determine the annualized capital cost, total capital investments are multiplied by the capital recovery factor, which is calculated as:

> [real interest rate * (1 + real interest rate)^(economic life of equipment in years)] / [(1 + real interest rate)^(economic life of equipment in years) - 1]

See id., app. B, at b.10 (representing the formula symbolically).

The denominator of the average cost-effectiveness formula is the difference between the baseline emission rate --

which "represents a realistic scenario of upper boundary uncontrolled emissions for the source," NSR Workshop Manual, supra, at B.37 -- and the emissions rate of the control option being evaluated. This figure indicates the annual reduction in tons of regulated pollutant that is expected to result from adopting the control option under consideration. See DEP BACT Guidance, supra, at 6. For the Weymouth station, because an electric motor does not emit NO_x, the control option emissions rate is zero.

Applying the average cost-effectiveness formula described above produces a measure of the cost per ton of pollutant (in this case, NO_x) controlled per year by using the control alternative. For NO_x, DEP has established that technologies falling in (or below) the range of $11,000 to $13,000 per ton of NO_x removed per year will be considered cost feasible. See DEP BACT Guidance, supra, at 5. Control technologies with an average cost-effectiveness that is more costly than this range may be excluded as not BACT at Step 4.

After completing the average cost-effectiveness calculations, DEP concluded that an electric motor was not BACT for the Weymouth station because its average cost-effectiveness far exceeded the range set by DEP. As inputs to the denominator, DEP considered two alternative baseline emissions rates for the

gas-fired turbine: 9 ppmvd[5] (or 10.03 tons per year) and 25 ppmvd (or 30.32 tons per year).

For the numerator, DEP adopted Algonquin's estimate of the total capital cost of installing an electric motor ($12,242,077), measured as the net additional cost of an electric motor over a gas-fired turbine.[6] As for the capital recovery factor, DEP applied an interest rate of 10.137% and assumed a fifty-year economic life for the electric motor, resulting in annualized capital costs of $1,250,993. The final component DEP considered for the numerator was annual operating costs. To calculate this figure, DEP determined the annual cost of electricity to fuel the proposed electric motor ($7,943,500) and subtracted annual operating costs uniquely associated with a gas-fired turbine ($2,106,763), arriving at annual operating costs of $5,836,737. Summing the annualized capital costs and the annual

[5] The unit ppmvd stands for parts per million by volume (dry basis), which is a measure of the concentration of a specified substance in air. Emissions in ppmvd are converted into tons of pollutant per year for purposes of the Step 4 cost-effectiveness calculations.

[6] All parties assume that the relevant control option costs in the numerator of the formula are the net costs associated with the use of an electric motor over a gas-fired turbine. Going forward, references to "capital costs" represents the capital costs unique to installing an electric motor reduced by the capital costs unique to a gas-fired turbine and references to "operating costs" represents the operating costs unique to running an electric motor reduced by the operating costs unique to a gas-fired turbine.

operating costs, DEP determined that the total annualized control cost was $7,087,730.

Dividing the total annualized control cost ($7,087,730) by the respective baseline emissions rates (10.03 tons per year and 30.32 tons per year), DEP found that an electric motor's average cost-effectiveness was significantly higher than DEP's cost-feasibility range of $11,000 to $13,000 per ton of NO_x removed per year.[7] Indeed, according to DEP's calculations, even entirely excluding the capital costs required to install an electric motor at the Weymouth station, the average cost-effectiveness of an electric motor still greatly exceeded the upper bound of DEP's guideline range.[8]

In its briefing before this court, the City argues that DEP's conclusion that an electric motor should be excluded at Step 4 of the BACT analysis as cost-infeasible was erroneous for several reasons. First, the City asserts that DEP erred by using incorrect baseline emissions rates for a gas-fired turbine in the

[7] According to DEP's calculations, the average cost-effectiveness of an electric motor was $706,653 per ton of NO_x controlled (assuming a 9 ppmvd baseline emissions rate) or $233,764 per ton of NO_x controlled (assuming a 25 ppmvd baseline emissions rate).

[8] Excluding capital costs entirely, DEP calculated the average cost-effectiveness of an electric motor to be $581,928 per ton of NO_x controlled (assuming a 9 ppmvd baseline emissions rate) or $192,505 per ton of NO_x controlled (assuming a 25 ppmvd baseline emissions rate).

denominator of the cost-effectiveness calculation (9 and 25 ppmvd) and should have used a higher baseline emissions rate (120 ppmvd) instead. The City explains that 120 ppmvd is a more accurate representation of the upper-bound emissions expected from a gas-fired turbine during non-standard conditions like low-load and sub-zero temperature operation. Second, the City contends that DEP improperly considered the cost of electricity in the numerator of the formula as an annual operating cost of an electric motor. The City argues that DEP should have written off an electric motor's annual operating costs because Algonquin could have completely recovered the cost of electricity used by the motor from its consumers.[9] Third, as to the annual capital costs component of the numerator, the City asserts that DEP's acceptance of Algonquin's calculations for the total capital and infrastructure costs of installing an electric motor was not supported by substantial evidence. Fourth, the City argues that DEP applied an unrealistic interest rate of 10.137% to calculate

[9] The City's expert, Dr. Sahu, argued in testimony before the Presiding Officer that the natural gas costs Algonquin used in its calculation of the annual operating cost of the gas-fired turbine were underestimated to make the operating costs for the electric motor look comparatively more expensive. In his own BACT Step 4 calculations, Dr. Sahu used the retail rate of natural gas as opposed to the lower wholesale rate proposed by Algonquin, which drastically reduced the total annual control cost in the numerator of the cost-effectiveness calculations. However, it does not appear that the City attempts to renew this contention on appeal. We, therefore, consider it waived.

the annualized capital costs of an electric motor and should have used the bank prime interest rate of 3%. Finally, the City contends that DEP improperly relied on its own guidance by evaluating an electric motor's cost-effectiveness against an outdated average cost-effectiveness range that was unadjusted for inflation.[10] In proceedings before the agency, the City proposed an inflation-adjusted cost-effectiveness range of $20,350 to $24,050.

It is unnecessary to delve too deeply into the labyrinthine ledgers of Algonquin's and DEP's cost-effectiveness calculations. Algonquin in its brief (and DEP at oral argument) contend that even if we were to agree with the City as to all its other proposed figures, an electric motor would still be properly eliminated at Step 4 unless we also agree with the City that the cost of electricity should be excluded. The City in its reply brief offered no cogent response to this contention. And our own review of the record does indeed indicate that the City's critical path to demonstrating that an electric motor is cost-effective at Step 4 runs through the City's claim that the cost of electricity to fuel an electric motor should be excluded from the electric motor's annual operating costs.

[10] DEP's BACT Guidance, issued in 2011, explains that the cost-effectiveness range applied here has been in use "[s]ince 1990." DEP BACT Guidance, supra, at 5.

As an illustration, let us assume that the City is correct that the proper baseline emissions rate for the gas-fired turbine is 120 ppmvd (or 145.54 tons per year NO_x), the highest estimated rate proposed by the City's expert.[11] We can also assume that we should adopt the City's proposed interest rate of 3%.[12] Calculating the average cost-effectiveness based on these figures results in an estimate of $43,373 per ton of NO_x reduced.[13] This well exceeds the City's proposed higher cost-effectiveness range

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[11] The City's expert, Dr. Sahu, proposed a baseline emissions rate of 120 ppmvd for a gas-fired turbine. From that rate, Dr. Sahu converted the emissions rate from ppmvd to tons per year based on two different conversion rates. For the purposes of this illustration, we assume the higher of the converted baseline emissions rates: 145.54 tons per year NO_x. This represents the upper-bound of the City's proposed baseline emissions rate.

[12] Adopting the City's proposed interest rate of 3% results in annualized capital costs of $475,794 based on Algonquin's estimate of $12,242,077 in total capital costs of installing an electric motor over a gas-fired turbine, and an assumption that the economic life of an electric motor is 50 years (an assumption both parties accept).

Annualized capital costs = $12,242,077 * [0.03 * (1 + 0.03)^50] / [(1 + 0.03)^50 - 1] = $475,794.

[13] Annual operating costs = $7,943,500 (annual operating costs of an electric motor) - $2,106,763 (unique annual operating costs of a gas-fired turbine) = $5,836,737.

Annualized cost of an electric motor = $5,836,737 (annual operating costs) + $475,794 (annualized capital costs) = $6,312,531.

Reduction in NO_x emissions from an electric motor = 145.54 tons per year (baseline emissions rate of a gas-fired turbine) - 0 tons per year (emissions rate of an electric motor).

Average cost-effectiveness of an electric motor = $6,312,531 per year / 145.54 tons per year = $43,373 per ton.

of $20,350 to $24,050 per ton of NO_x reduced. To take this further, suppose we also agree with the City that DEP's estimates for the total capital costs of installing an electric motor are wholly inaccurate. Although the City does not provide its own figure, we can proceed under the assumption that the additional capital costs of installing an electric motor over a gas-fired turbine are $0, a number that is likely lower than any the City could have provided. The average cost-effectiveness of an electric motor in this scenario is still nearly double the City's proposed range.[14]

Only if we accept the City's argument that the annual operating costs of an electric motor should be completely written off does the cost of an electric motor become low enough so that the other alleged errors to which the City points could make a difference in the outcome. Thus, the City's argument turns on whether the annual operating costs -- i.e., the cost of electricity necessary each year to operate an electric motor -- should be set at $0 in the cost-effectiveness calculation at Step 4 of the BACT analysis.[15]

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[14] Annualized cost of an electric motor = $5,836,737 (annual operating costs) + $0 (annualized capital costs) = $5,836,737.

Average cost-effectiveness of an electric motor = $5,836,737 per year / 145.54 tons per year = $40,104 per ton.

[15] The City presents, in the statement of the case section of its opening brief, a potential alternative argument: that Algonquin inflated the annual cost of electricity to power an electric motor. The City proposes that a more accurate figure would be $6,574,775 per year. This argument is waived because the

The City asserts that the annual electricity costs of an electric motor should be $0 because Algonquin can simply pass along its utility costs to its consumers and completely recoup these costs each year. The City's argument focuses on a supposed admission from one of Algonquin's witnesses, Christopher Harvey, that Algonquin or its parent company could recover the electricity costs required to power an electric motor by including an additional charge in the rates negotiated with its customers. If the City is correct and annual operating costs should be set at $0, it would significantly shrink the numerator in the cost-effectiveness formula and make an electric motor's economic feasibility a closer question.

The Presiding Officer, though, found that Christopher Harvey's testimony only established that Algonquin's parent company could negotiate electric power costs into the rates it charges its customers as a general matter, not that it could be done for the Weymouth station or the Atlantic Bridge Project in particular. Indeed, Harvey's testimony explained that the recovery of electricity costs "varie[d] by contract and by individual pipeline."

City failed to develop it outside of a casual mention in the background section of its brief. See United States v. Zannino, 895 F.2d 1, 17 (1st Cir. 1990). In any event, adopting the City's proposed figure would still not make an electric motor cost-effective.

Additionally, even assuming that Algonquin could recover all of the electricity costs of an electric motor from its customers, the City points to no authority supporting its contention that recoverable utility costs must be excluded from the cost-effectiveness analysis. Nor do we see any basis for finding this contention so compelling as to make its rejection by DEP arbitrary and capricious. It is not self-evident why pass-along costs must, as a categorical matter, be excluded from the annual operating costs of a control technology simply because they can be recouped from consumers. Unless a business is to run at a loss, all costs are presumably passed along to customers in some form or another.

Relevant EPA guidance, which DEP has adopted, expressly contemplates that electricity and other utility costs be factored into the assessment of the operating costs of a proposed control technology. For instance, the NSR Workshop Manual explains that when assessing the "energy requirements of the control technology" in Step 4, "the energy impacts analysis can, in most cases, simply be factored into the economic impacts analysis" because energy consumption "can usually be quantified in terms of additional cost or income to the source." NSR Workshop Manual, supra, at B.29-B.30; see also id., app. B, at b.9 (considering electricity as a direct cost in an example cost estimate). Similarly, DEP's BACT Guidance makes clear that "[a]s a matter of course, energy impacts

and costs are considered in the economic impacts assessment of Top-Down BACT." DEP BACT Guidance, supra, at 4; see also id. at 5 (listing "[f]uel and electricity costs" as line items to include in the economic impacts analysis). Finally, the EPA Air Pollution Control Cost Manual, which DEP expressly references in its BACT Guidance, contemplates including the electricity costs of a control as an operating cost. See EPA, Office of Air Quality Planning and Standards, EPA Air Pollution Control Cost Manual, ch. 2, § 2.4.1, at 9 (2017) (categorizing utility costs as an operating cost and including electricity as a utility cost); see also id. § 2.6.5.4, at 33 (describing electricity as an example of an annual utility cost). Thus, in including the cost of electricity as an annual operating cost for an electric motor, DEP simply followed its established guidance and procedures. See DEP BACT Guidance, supra, at 4 (incorporating the EPA Air Pollution Control Cost Manual by reference).

For all of these reasons, the City has not convinced us that DEP inappropriately considered the cost of electricity as a component of the annual operating cost of an electric motor. And, as we have explained, that decision obviates any need to consider the collectively inconsequential other alleged errors in DEP's BACT analysis.

Because DEP's finding that an electric motor could be excluded at Step 4 of the BACT analysis was neither arbitrary nor

capricious, we have no need to also decide whether an electric motor could also be excluded at Step 1. Therefore, we decline to address whether an electric motor would "redefine the source" at Step 1.

B.

The City's only other argument is that DEP failed to comply with Massachusetts's Environmental Justice Policy (the "EJ Policy"). We previously rejected a nearly identical claim based on this policy brought by the City and other petitioners in Town of Weymouth. See 961 F.3d at 54. Although the City points us to intervening changes to the EJ Policy since our decision, we see nothing in those changes that disturbs our prior reasoning. In any event, in Town of Weymouth we remanded to DEP to conduct further proceedings "limited to the purposes we [had] identified." Id. at 59 (remanding to that agency to reconduct the BACT analysis). A reassessment of the air permit under the EJ Policy was not one of those purposes.

IV.

We deny the City's petition for review and affirm DEP's final decision after remand.