

United States Court of Appeals
FOR THE DISTRICT OF COLUMBIA CIRCUIT

Argued October 3, 2018

Decided September 13, 2019

No. 16-1406

STATE OF WISCONSIN, ET AL.,
PETITIONERS

v.

ENVIRONMENTAL PROTECTION AGENCY AND ANDREW
WHEELER, ADMINISTRATOR, UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY,
RESPONDENTS

AMERICAN LUNG ASSOCIATION, ET AL.,
INTERVENORS

Consolidated with 16-1428, 16-1429, 16-1432, 16-1436,
16-1437, 16-1438, 16-1439, 16-1440, 16-1441, 16-1442,
16-1443, 16-1444, 16-1445, 16-1448, 17-1066

On Petitions for Review of Final Action of the
United States Environmental Protection Agency

Neil Gormley argued the cause for petitioners
Conservation Groups. *Valerie S. Edge*, Deputy Attorney
General, Office of the Attorney General for the State of
Delaware, argued the cause for petitioner State of Delaware.

With them on the briefs were *David Baron*, *Charles McPhedran*, *Joshua R. Stebbins*, and *Zachary M. Fabish*. *Seth L. Johnson* entered an appearance.

Misha Tseytlin, Solicitor General, Office of the Attorney General for the State of Wisconsin, and *Harvey M. Sheldon* argued the causes for State Petitioners, Cedar Falls Utilities, and City of Ames, Iowa. With them on the briefs were *Brad D. Schimel*, Attorney General, *Luke N. Berg*, Deputy Solicitor General, *Peter Michael*, Attorney General, Office of the Attorney General for the State of Wyoming, *James Kaste*, Deputy Attorney General, *Erik Petersen*, Senior Assistant Attorney General, *Leslie Sue Ritts*, *Steve Marshall*, Attorney General, Office of the Attorney General for the State of Alabama, *Robert D. Tambling*, Assistant Attorney General, *Leslie Rutledge*, Attorney General, Office of the Attorney General for the State of Arkansas, *Nicholas J. Bronni*, Deputy Solicitor General, *Michael DeWine*, Attorney General, Office of the Attorney General for the State of Ohio, *Eric E. Murphy*, State Solicitor, *Ken Paxton*, Attorney General, Office of the Attorney General for the State of Texas, *Priscilla M. Hubenak*, and *Craig J. Pritzlaff* and *Linda B. Secord*, Assistant Attorneys General. *Andrew L. Brasher*, Deputy Solicitor, Office of the Attorney General for the State of Alabama, *Michael J. McGrady*, Senior Assistant Attorney General, Office of the Attorney General for the State of Wyoming, *Lee P. Rudofsky*, Solicitor, Office of the Attorney General for the State of Arkansas, and *Ryan Walsh* entered appearances.

Norman W. Fichthorn, *Aaron M. Streett*, and *C. Grady Moore, III* argued the causes for Industry Petitioners. With them on the briefs were *E. Carter Chandler Clements*, *Peter S. Glaser*, *Margaret Claiborne Campbell*, *M. Buck Dixon*, *Scott C. Oostdyk*, *E. Duncan Getchell, Jr.*, *Michael H. Brady*, *Jane E. Montgomery*, *J. Michael Showalter*, *Amy Antonioli*, *P.*

Stephen Gidiere, III, Julia B. Barber, David W. Mitchell, Daniel J. Kelly, David M. Flannery, Kathy G. Beckett, Edward L. Kropp, Megan H. Berge, Charles T. Wehland, Todd E. Palmer, John A. Sheehan, Valerie L. Green, Ben H. Stone, Terese T. Wyly, M. Brant Pettis, Louis E. Tosi, Cheri A. Budzynski, and Michael A. Born. Alina Fortson and Jordan Hemaidan entered appearances.

Amy J. Dona and Chloe H. Kolman, Attorneys, U.S. Department of Justice, argued the causes for respondents. With them on the brief were Jonathan Brightbill, Deputy Assistant Attorney General, and Stephanie L. Hogan, Attorney, U.S. Environmental Protection Agency.

E. Carter Chandler Clements argued the cause for Industry Respondent-Intervenors. With her on the brief were Norman W. Fichthorn, Peter S. Glaser, Margaret Claiborne Campbell, M. Buck Dixon, Scott C. Oostdyk, E. Duncan Getchell, Jr., Michael H. Brady, Robert A. Manning, and Joseph A. Brown.

Andrew G. Frank, Assistant Attorney General, argued the cause for State Intervenors. With him on the brief were Eric T. Schneiderman, Attorney General at the time the brief was filed, Office of the Attorney General for the State of New York, Barbara D. Underwood, Solicitor General, Steven C. Wu, Deputy Solicitor General, Michael J. Myers, Senior Counsel, Maura Healey, Attorney General, Office of the Attorney General for the Commonwealth of Massachusetts, Jillian M. Riley, Assistant Attorney General, Environmental Protection Division, Peter F. Kilmartin, Attorney General, Rhode Island Department of Attorney General, Gregory S. Schultz, Special Assistant Attorney General, Brian E. Frosh, Attorney General, Office of the Attorney General for the State of Maryland, Michael F. Strande, Assistant Attorney General, Gordon J. MacDonald, Attorney General, K. Allen Brooks, Assistant

Attorney General, New Hampshire Office of the Attorney General, *Thomas J. Donovan, Jr.*, Attorney General, Office of the Attorney General for the State of Vermont, and *Nicholas F. Persampieri*, Assistant Attorney General. *Morgan A. Costello*, Assistant Attorney General, Office of the Attorney General for the State of New York, entered an appearance.

Charles McPhedran argued the cause for Public Health and Environmental Intervenors. With him on the brief were *Sean H. Donahue*, *Susannah L. Weaver*, *Graham G. McCahan*, *Vickie L. Patton*, *Ann Brewster Weeks*, *Neil Gormley*, *David Baron*, *Howard Fox*, *Joshua R. Stebbins*, and *Zachary M. Fabish*.

Hope M. Babcock was on the brief for *amicus curiae* American Thoracic Society in support of respondent-intervenors American Lung Association, Appalachian Mountain Club, Environmental Defense Fund, and Sierra Club.

Before: SRINIVASAN, MILLETT and WILKINS, *Circuit Judges*.

PER CURIAM: When upwind States pollute, downwind States can suffer the consequences. Congress addressed that problem in the Clean Air Act by enacting a “Good Neighbor Provision.” The Provision requires upwind States to eliminate their significant contributions to air quality problems in downwind States.

In 2016, the Environmental Protection Agency implemented that requirement by promulgating a regulation addressing the interstate transport of ozone, or smog. A number of parties brought challenges to the Rule, some contending that the Rule is too strict and others contending that it is too lenient.

We conclude that, in one respect, the Rule is inconsistent with the Act: it allows upwind States to continue their significant contributions to downwind air quality problems beyond the statutory deadlines by which downwind States must demonstrate their attainment of air quality standards. In all other respects, though, we determine that EPA acted lawfully and rationally.

I

The Clean Air Act tasks EPA with setting national ambient air quality standards, or NAAQS. *See* 42 U.S.C. § 7409(a). Individual States must ensure that their ambient air quality complies with the national standard. To that end, the Clean Air Act requires States to adopt State implementation plans, or SIPs, that provide for implementation, maintenance and enforcement of the national standard. *Id.* § 7410(a)(1). If a State fails to submit a SIP, or if EPA disapproves it, EPA must issue a federal implementation plan, or FIP, to correct any deficiency. *Id.* § 7410(c)(1).

State-level regulation of air quality faces a confounding variable. Air pollution, once emitted, drifts with the wind. Upwind pollutants affect air quality in downwind States via various chemical processes. Ozone, for example, forms from the interaction of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) in the presence of sunlight. For downwind States, upwind emissions of these ozone precursors can pose a significant problem. According to a study referenced by EPA, on average, over three-quarters of the ground-level ozone in downwind States comes from upwind emissions. 81 Fed. Reg. at 74,514.

Congress included a Good Neighbor Provision in the Clean Air Act to address the problem of upwind States' pollution impairing downwind States' air quality. The Provision prohibits States from "emitting any air pollutant in amounts" that will "contribute significantly to nonattainment" or "interfere with maintenance" of air quality in other States. 42 U.S.C. § 7410(a)(2)(D)(i).

EPA has addressed the Good Neighbor Provision's requirements in a series of rulemakings. In 2011, EPA promulgated the Cross-State Air Pollution Rule (CSAPR), which applied to States whose upwind pollution violated good neighbor obligations under the 1997 ozone NAAQS and the 1997 and 2006 fine particulate matter NAAQS. *See* 76 Fed. Reg. 48,208 (Aug. 8, 2011).

In 2008, EPA reduced the ozone NAAQS from 80 parts per billion (ppb) to 75 ppb. As a result, EPA promulgated the rule at issue in this case: an update to the CSAPR for eastern States that accounts for the stricter 2008 ozone NAAQS. *See* Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS, 81 Fed. Reg. 74,504 (Oct. 26, 2016) (Update Rule). Under the Update Rule, EPA proceeded in four steps.

At the first step, EPA identified downwind States expected to have problems attaining or maintaining air quality in compliance with the 2008 ozone NAAQS. To identify those States, EPA had to estimate the future air quality in each State. *Id.* at 74,516–17. EPA devised a measure to turn 2011 ozone measurements into 2017 projections.

EPA started with 2011 modeled data from "receptors," devices in each State that measure air quality. EPA modeled ozone concentrations in a three-by-three grid around each receptor. EPA chose the ten days with the highest projected

ozone concentration, noted which of the nine 12-km² grid cells had the highest ozone concentration on that day, and averaged the ten observations. *See id.* at 74,526–27. EPA then ran the model for 2017, inputting 2011 environmental conditions (like rainfall and fire emissions) but projected 2017 NO_x emissions rates. The percentage change from 2011 to 2017 was deemed a receptor’s “relative response factor,” which measures the sensitivity of an area to ozone formation. Multiplying a 2011 observation by the relevant response factor yielded a projection for 2017 for the receptor.

EPA projected 2017 ozone levels for each receptor by applying the relative response factor to three “design values” from a receptor across a five-year period. A “design value” is a three-year historical average of monitored ozone data. The selected design values represented 2009–2011, 2010–2012, and 2011–2013. *See id.* at 74,532. Multiplying the three design values by the applicable relative response factor resulted in three different ozone projections for 2017.

In light of the 2008 ozone NAAQS of 75 ppb, EPA considered any projected value of up to 75.9 ppb to constitute attainment. *Id.* EPA defined a receptor to be in “nonattainment” status if the average of its three projected design values and its most recent monitored design value (2013–2015) exceeded the NAAQS. *Id.* EPA also identified a third category (beyond attainment and nonattainment): a receptor would be deemed in “maintenance” status if the highest of the three projected design values exceeded the NAAQS but the other two values did not. *Id.*

At the second step, EPA identified those upwind States whose pollution was linked to nonattainment or nonmaintenance at downwind receptors. EPA quantified the impact of each State’s pollution on downwind receptors using

a model that apportioned responsibility for ozone formation at a given receptor to various categories of emitters. *See id.* at 74,536. EPA then multiplied a given State's contribution factor by the projected average ozone concentration at each receptor (calculated in Step 1) to yield each State's contribution to ozone formation at each downwind receptor.

Next, EPA screened out States whose contributions to ozone formation in a downwind State comprised less than 1% of the NAAQS (0.75 ppb) in that downwind State. *See id.* at 74,537. In other words, EPA construed "contribute significantly" and "interfere with" in the Good Neighbor Provision to require an upwind State's pollution to cause at least 0.75 ppb of ozone formation in a downwind State. EPA's analysis concluded that twenty-three States and the District of Columbia were linked to nonattainment or nonmaintenance in at least one downwind State. Fourteen States' contributions fell below the 1% threshold and thus were screened out at this step. *See id.*

At the third step, EPA quantified the amount of emissions reductions that the twenty-three upwind States and the District of Columbia would be required to make under the Good Neighbor Provision. To do so, EPA applied a multifactor test that balanced costs against benefits.

EPA first measured the emissions reductions that would occur at various levels of cost controls. It began with a baseline case (*i.e.*, a cost-control level of \$0). It then ran the model for a cost-control level of \$800 per ton—in other words, measuring the emissions reductions that would occur if EPA required all States to apply all possible emissions controls at its EGUs (electric generating units, or power plants) up to the marginal price of \$800 per ton of NO_x. *See id.* at 74,540–41. EPA then ran the model for higher cost-control levels of \$1,400/ton,

\$3,400/ton, \$5,000/ton, and \$6,400/ton. For each of these cost-control levels, EPA also estimated the air quality improvements that would occur at each receptor in downwind States. Comparing the cost-control levels against the resulting emissions reductions and air quality improvements, EPA concluded that the cost-control level of \$1,400 per ton represented the point at which upwind “NO_x reduction potential and corresponding downwind ozone air quality improvements are maximized with respect to marginal cost” — that is, the point at which EPA would get the biggest bang for its buck. *Id.* at 74,550.

As part of that analysis, EPA also performed an “overcontrol” analysis to ensure that no upwind State would be required to reduce its emissions more than called for by the Good Neighbor Provision. Overcontrol would occur if either (1) a State’s downwind receptors all reduced their ozone concentrations below the NAAQS, or (2) a State’s contributions to all downwind receptors was reduced below the 1% contribution threshold of 0.75 ppb. *See EME Homer City Gen., L.P. v. EPA*, 572 U.S. 489, 521 (2014) (“*EME Homer II*”). EPA concluded that neither of those indicia of overcontrol existed at the \$800/ton and \$1,400/ton cost-control levels. *See* 81 Fed. Reg. at 74,551–52.

At the fourth step, EPA quantified State emissions “budgets” by calculating the emissions amount that would occur under \$1,400/ton cost controls. Under the CSAPR, States may emit more NO_x than permitted by their budgets by acquiring allowances from other States, and States may sell allowances to other States if they reduce their emissions more than required by their budgets. *Id.* at 74,554. But to ensure that a State does not entirely skirt its good neighbor obligations by buying a large number of allowances, each State is limited

to emitting no more than 121% of the emissions budget (the “assurance level”), irrespective of allowances. *See id.*

After EPA promulgated the original CSAPR, various parties brought a challenge to that rule. We initially vacated the rule, *see EME Homer City Generation, L.P. v. EPA*, 696 F.3d 7 (D.C. Cir. 2012) (“*EME Homer I*”), but the Supreme Court reversed our decision and upheld the rule in its entirety, although it left open the possibility of as-applied challenges, *see EME Homer II*, 572 U.S. at 495. On remand, we found that emissions budgets for thirteen States were invalid due to overcontrol. *EME Homer City Generation, L.P. v. EPA*, 795 F.3d 118, 124 (D.C. Cir. 2015) (“*EME Homer III*”).

In 2016, EPA promulgated the Update Rule at issue here. A number of parties have petitioned for review of the Rule in this court. *See* 42 U.S.C. § 7607(d)(9). One group of petitioners, including environmental groups and the State of Delaware (collectively, Environmental Petitioners), contends that EPA was required to adopt a more stringent rule. Another group of petitioners, including various States and industry groups (collectively, State and Industry Petitioners), argues that EPA was required to issue a more lenient rule.

II

We begin by addressing Environmental Petitioners’ claims. Environmental Petitioners challenge the Update Rule on the grounds that it: (i) fails to square with the statutory attainment deadlines, (ii) makes impermissible modeling and implementation choices, and (iii) incorrectly classifies Delaware as an attaining downwind State.

The Rule must be set aside if it is “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law”

or “in excess of statutory jurisdiction, authority, or limitations.” 42 U.S.C. § 7607(d)(9). That standard is “essentially the same” as the familiar standard of review contained in § 706(2) of the Administrative Procedure Act. *Ethyl Corp. v. EPA*, 51 F.3d 1053, 1064 (D.C. Cir. 1995).

Applying that standard, we agree with Environmental Petitioners that the Rule is inconsistent with the Act’s attainment deadlines. We reject Environmental Petitioners’ remaining claims.

A

We first consider Environmental Petitioners’ argument that the Update Rule infringes the Good Neighbor Provision by permitting upwind States to continue their significant contributions to downwind air quality problems for too long—*i.e.*, past the statutory deadlines for nonattaining downwind areas to meet the NAAQS for ozone. In fact, EPA set no concrete deadline at all for upwind States to eliminate their contributions to downwind States’ nonattainment.

The Good Neighbor Provision requires States to submit SIPs that “prohibit[], consistent with the provisions of this subchapter [*i.e.*, Title I of the Act], any source . . . from emitting any air pollutant in amounts which will . . . contribute significantly to nonattainment in . . . any other State with respect to any” NAAQS. 42 U.S.C. § 7410(a)(2)(D)(i). If a State fails to submit a SIP or submits one deemed inadequate, such that EPA must then prepare a FIP, EPA must likewise satisfy the Good Neighbor Provision in the FIP. *See EME Homer II*, 572 U.S. at 512–14 & n.15.

The question we face is one of timing: the Good Neighbor Provision calls for upwind States to eliminate their significant

contributions to air pollution in downwind States, but by when must upwind States do so? In particular, does the Provision call for upwind States to eliminate their significant contributions to downwind pollution by the deadlines for downwind areas to comply with the relevant NAAQS—here, the 2008 NAAQS for ozone?

Those deadlines are prescribed by the Act. The Act first tasks EPA with designating as “nonattainment” any area that does not meet a NAAQS. *See* 42 U.S.C. § 7407(d)(1)(A). For areas designated as nonattainment for ozone, the Act specifies that each State must secure compliance “as expeditiously as practicable *but not later than*” a date certain. *Id.* § 7511(a)(1) (emphasis added). That date is July 20, 2018, for areas in “moderate” nonattainment with respect to the 2008 NAAQS (and was July 20, 2015 for areas in “marginal” nonattainment). *See Nat. Res. Def. Council v. EPA*, 777 F.3d. 456, 465–66 (D.C. Cir. 2014); Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements, 80 Fed. Reg. 12,264, 12,268 (Mar. 6, 2015).

The Update Rule does not require upwind States to eliminate their significant contributions to downwind ozone pollution by that date—or by any date, for that matter. EPA acknowledges that, except for one State (Tennessee), it “is only quantifying a *subset* of each State’s emission reduction obligation pursuant to the good neighbor provision.” 81 Fed. Reg. at 74,520 (emphasis added); *see id.* at 74,508 n.19. And the Rule states that it represents only a “first, partial step to addressing a given upwind State’s significant contribution to downwind air quality impacts for the 2008 ozone NAAQS.” *Id.* at 74,522. That is in large part because the Update Rule confines itself to addressing upwind contributions from EGUs due to an ostensible lack of information about non-EGUs. EPA

“expects that a full resolution of upwind transport obligations would require emission reductions from sectors besides EGUs,” along with “further EGU reductions that are achievable after 2017.” *Id.* The upshot is that, while the Rule calls for a certain level of reductions in upwind contributions by the 2017 ozone year—“in time to assist downwind states to meet the July 2018 attainment deadlines”—the Rule does not purport to require upwind States to fully meet their good neighbor obligations by that time. *Id.*

Under the Update Rule, then, downwind States face a dilemma. On one hand, they operate under a statutory obligation to secure compliance with the ozone NAAQS by July 20, 2018. But on the other hand, the Rule does not require upwind States to eliminate their significant contributions to downwind pollution by that deadline. Environmental Petitioners argue that the Rule is inconsistent with the Act in failing to require upwind States to eliminate their significant contributions in accordance with the deadline by which downwind States must come into compliance with the NAAQS. We agree.

That conclusion follows from our decision in *North Carolina v. EPA*, 531 F.3d 896 (D.C. Cir. 2008). There, we considered essentially the same question we now face here: whether EPA can allow upwind States to continue their significant contributions to downwind pollution beyond the statutory deadlines for downwind States to meet the NAAQS. *North Carolina* involved the Clean Air Interstate Rule (CAIR), a prior EPA effort to implement the Good Neighbor Provision with regard to the then-applicable NAAQS for two pollutants, fine particulate matter (PM_{2.5}) and ozone. *See id.* at 903–06. Although the statutory deadline for nonattaining areas to

comply with those NAAQS was 2010, CAIR gave upwind States until 2015 to eliminate their significant contributions to downwind nonattainment. *See id.* at 911.

We held that CAIR's "deadline of 2015 [was] unlawful." *Id.* at 913. We explained that, under the terms of the Good Neighbor Provision, upwind States must eliminate their significant contributions "consistent with the provisions" of Title I of the Act. *See id.* at 911–12; 42 U.S.C. § 7410(a)(2)(D)(i). And the incorporated provisions of Title I, we further explained, include ones setting the attainment deadlines for downwind areas. *See* 42 U.S.C. § 7502(a)(2)(A) (PM_{2.5}); *id.* § 7511 (ozone). But under CAIR, "downwind nonattainment areas [were required to] attain NAAQS for ozone and PM_{2.5}" by 2010, "without the elimination" by then "of upwind states' significant contribution to downwind nonattainment, forcing downwind areas to make greater reductions than [the Good Neighbor Provision] requires." *North Carolina*, 531 F.3d at 912. As a result, we concluded, "EPA ignored its statutory mandate to promulgate CAIR consistent with the provisions in Title I mandating compliance deadlines for downwind states in 2010." *Id.*

All of that is equally true here. Just as with CAIR, the CSAPR Update Rule we consider in this case fails to eliminate upwind States' significant contributions to downwind pollution by the statutory deadline for downwind States to meet the NAAQS for ozone. That in turn "forc[es] downwind areas to make greater reductions than [the Good Neighbor Provision] requires." *Id.* Indeed, CAIR at least imposed *some* deadline for upwind States to fully satisfy their good neighbor obligations, albeit a deadline we held was too late. Here, by contrast, EPA established no deadline at all for upwind States to eliminate their significant contributions. And while EPA concluded that requiring upwind States to meet their good

neighbor obligations by the 2018 attainment deadline “simply [was] not feasible in the existing timeframe,” 81 Fed. Reg. 74,523, in *North Carolina*, EPA had likewise sought (unsuccessfully) to rely “on reasons of feasibility.” 531 F.3d at 911.

EPA contends that *North Carolina* required it only to “consider” the attainment deadline in some fashion when establishing upwind States’ good neighbor responsibilities, not to align the attainment deadline with the deadline for satisfying good neighbor obligations. And EPA argues that the Update Rule gives the requisite consideration to the July 2018 attainment deadline by requiring at least some level of good neighbor reductions by that date.

North Carolina, though, requires more than merely “considering” attainment deadlines in that manner. In fact, CAIR provided for a first phase of reductions in upwind contributions to take place before the attainment deadlines. See *id.* at 903. But that was not enough to satisfy the statute. The problem was that the eventual elimination of significant upwind contributions in the second phase of reductions would occur only long after the attainment deadlines had passed.

We explained that EPA needed to “harmonize” the “Phase Two deadline for upwind contributors to *eliminate* their significant contribution with the attainment deadlines for downwind areas.” *Id.* at 912 (emphasis added). Otherwise, downwind areas would need to attain the NAAQS “without the elimination of upwind states’ significant contribution.” *Id.* The Rule here creates the same situation. (And we note it does so with respect to both the 2018 and 2015 deadlines. Although EPA contends that the claim as to the 2015 deadlines was forfeited, we disagree. See Comment of Sierra Club et al., at

8–9, EPA Docket No. 2015-0500-0287 (Feb. 1, 2016), J.A. 1015–16.)

EPA notes that, when we addressed the issue of the appropriate remedy at the conclusion of our opinion in *North Carolina*, we observed that EPA would need to “decide what date, *whether 2015 or earlier*, is as expeditious as practicable for states to eliminate their significant contributions to downwind nonattainment.” 561 F.3d at 930 (emphasis added). But our reference to 2015 did not suggest that EPA could delay the deadline for upwind States to eliminate their significant contributions until 5 years after the 2010 attainment deadline. The entire object of our analysis was to reject the notion that the Phase Two deadline of 2015 could be squared with the Good Neighbor Provision. *See id.* at 913 (EPA operated “under the assumption that 2015 was an appropriate deadline for CAIR compliance. It is not.”). Rather, we presumably referred to 2015 because, as we had earlier specifically noted, EPA has separate statutory authority to extend the deadline for attaining the NAAQS for PM_{2.5}—and thereby correspondingly also extend the good neighbor deadline—for up to five years, or until 2015. *See id.* at 911 (citing 42 U.S.C. § 7502(a)(2)(A)).

In sum, under our decision in *North Carolina*, the Good Neighbor Provision calls for elimination of upwind States’ significant contributions on par with the relevant downwind attainment deadlines. The Update Rule fails to do so.

North Carolina’s understanding of the Good Neighbor Provision is confirmed by examining the Update Rule under the framework set out in *Chevron U.S.A. Inc. v. Nat. Res. Def. Council, Inc.*, 467 U.S. 837 (1984). *See EME Homer II*, 572 U.S. at 512–14 (evaluating previous EPA implementation of

the Good Neighbor Provision under *Chevron*); see also *Util. Air Regulatory Grp. v. EPA*, 573 U.S. 302, 315 (2014) (“We review EPA’s interpretations of the Clean Air Act using the standard set forth in *Chevron*.”).

“Under *Chevron*, we presume that when an agency-administered statute is ambiguous with respect to what it prescribes, Congress has empowered the agency to resolve the ambiguity.” *Util. Air. Regulatory Grp.*, 573 U.S. at 315. The question then “is whether in doing so the agency has acted reasonably and thus has ‘stayed within the bounds of its statutory authority.’” *Id.* (quoting *Arlington v. FCC*, 569 U.S. 290, 296 (2013)). Here, the Update Rule’s open-ended compliance timeframe exceeds the bounds of EPA’s statutory authority by allowing upwind States to continue their significant contributions to downwind nonattainment well past the deadline for downwind areas to comply with the NAAQS.

The threshold question under *Chevron* ordinarily would be whether the statute is ambiguous on that issue, such that the agency then would have discretion to choose among reasonable interpretations. *E.g., id.* But there is no need to resolve that threshold issue in this case, because, regardless of ambiguity, the Update Rule amounts to an unreasonable—and hence impermissible—interpretation of the statute in any event. See *Michigan v. EPA*, 135 S. Ct. 2699, 2707 (2015); *Massachusetts v. U.S. Dep’t of Transp.*, 93 F.3d 890, 892 (D.C. Cir. 1996) (declining to resolve how *Chevron* might apply because “the agency’s determination here cannot be upheld with or without deference”).

The Good Neighbor Provision, as *North Carolina* emphasized, requires upwind States to eliminate their significant contributions to downwind pollution “consistent with the provisions of this subchapter,” *i.e.*, Title I of the Clean

Air Act. 42 U.S.C. § 7410(a)(2). One of the “provisions of this subchapter” is § 7511(a)(1), which in turn requires downwind areas in moderate nonattainment to attain the NAAQS by July 20, 2018. *See id.* § 7511(a)(1); 81 Fed. Reg. at 74,507. The statute cannot reasonably be understood to enable upwind States to continue their significant contributions outside of the statutory timeframe by which downwind areas must achieve attainment, much less continue those contributions with no deadline at all.

We note that we do not conclude that the phrase “consistent with” in the Good Neighbor Provision necessarily effects an incorporation of the full contours of *every* provision of Title I in pure, lockstep fashion. As we have observed elsewhere in construing the same words in the context of the same statute, the phrase “consistent with” other statutory sections “calls for congruence or compatibility with those sections, not lock-step correspondence.” *Env'tl. Def. Fund Inc. v. EPA*, 82 F.3d 451, 460 (D.C. Cir. 1996); *see Nuclear Energy Institute, Inc. v. EPA*, 373 F.3d 1251, 1270 (D.C. Cir. 2004) (The “‘based upon and consistent with’ standard does not require EPA to walk in lockstep”).

Rather, it is the statutorily designed relationship between the Good Neighbor Provision’s obligations for upwind States and the statutory attainment deadlines for downwind areas that generally calls for parallel timeframes. The Good Neighbor Provision was enacted “to enable downwind States to keep their levels of [air pollution] in check.” *EME Homer II*, 572 U.S. at 496–97. A “reasonable statutory interpretation” of the Provision “must account for . . . the broader context of the statute as a whole.” *Util. Air Regulatory Grp.*, 573 U.S. at 321. And the attainment deadlines, the Supreme Court has said, are “the heart” of the Act. *Train v. Nat. Res. Def. Council*, 421 U.S. 60, 66 (1975); *see Sierra Club v. EPA*, 294 F.3d 155, 161

(D.C. Cir. 2002) (“the attainment deadlines are central to the regulatory scheme”) (alteration and internal quotation marks omitted). The Act’s central object is the “attain[ment] [of] air quality of specified standards [within] a specified period of time.” *Train*, 421 U.S. at 64–65.

EPA’s interpretation of the Good Neighbor Provision subverts that scheme. Under the Update Rule, downwind States face a crucial statutory obligation to secure attainment of the ozone NAAQS by July 20, 2018 (or July 20, 2015), even though upwind States face no symmetrical obligation to eliminate their significant contributions to downwind nonattainment by that deadline. The Rule thus puts downwind States to the choice of flouting the attainment deadlines or making greater reductions than the Good Neighbor Provision requires. That choice is “incompatible with the substance of Congress’ regulatory scheme.” *Util. Air Regulatory Grp.*, 573 U.S. at 322 (internal quotation marks omitted).

That becomes particularly evident when one considers the extent to which pollution from upwind States adversely affects the ability of downwind States to attain the NAAQS. According to a study EPA cited in the Update Rule’s preamble, “on average 77 percent of each state’s ground-level ozone is produced by precursor emissions from upwind states.” 81 Fed. Reg. at 74,514.

Consider, in this regard, the Rule’s 2017 projections for one nonattainment area: Fairfield County, Connecticut. EPA projects that, after the good neighbor reductions called for by the Rule, a monitor in that area would observe an average ozone concentration of 76.5 ppb, or 1.5 ppb more than the NAAQS. Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Air Quality Modeling Technical Support Document for the Final Cross State Air

Pollution Rule 14 (Aug. 2016). According to EPA, 53.82 ppb of that 76.5 ppb would be caused by pollution from U.S. States (including Connecticut itself). Appendix C, Contributions to 2017 8-Hour Ozone Design Values at Projected 2017 Nonattainment and Maintenance-Only Sites at C-4 (Aug. 2016). Yet Connecticut's own emissions, according to EPA's projections, would account for only 3.89 ppb of that 53.82. *Id.* at C-3. The rest would come from upwind contributions, with a significant share from one State alone (New York, which is projected to contribute 17.22 ppb). *Id.*

Because Connecticut does not get enough help from upwind States under the Update Rule, if Connecticut wanted to bring Fairfield County into attainment by the 2018 deadline, it would need to reduce its own ozone precursor emissions by almost 40% (1.5 ppb over 3.89). And missing that attainment deadline carries serious consequences, triggering a host of strict mandatory emissions controls and a bump-up from "moderate" to "serious" nonattainment status. *See South Coast Air Quality Mgmt. Dist. v. EPA*, 472 F.3d 882, 887 (D.C. Cir. 2006); 42 U.S.C. § 7511(a). That has recently occurred for eight nonattainment areas which failed to meet the NAAQS by the July 2018 deadline, including Fairfield County. 84 Fed. Reg. 44,239 (Aug. 23, 2019).

The structure of the provision establishing the statutory attainment deadlines for ozone reinforces the Update Rule's impermissibility. That provision calls for downwind States to secure attainment "as expeditiously as practicable but not later than" the deadline. 42 U.S.C. § 7511(a). The deadline, that is, functions as the ultimate failsafe. By imposing a first-order obligation to attain the NAAQS "as expeditiously as practicable," Congress "made clear that the States could not procrastinate until the deadline approached. Rather, the primary standards had to be met in less [time] if possible."

Union Elec. Co. v. EPA, 427 U.S. 246, 259–60 (1976). In light of that mandate, EPA “does not dispute that it has an obligation to implement [upwind States’] Good Neighbor emission reductions as expeditiously as practicable to benefit affected downwind areas.” EPA’s Br. 26.

But if EPA must provide for upwind States to satisfy their good neighbor obligations as “expeditiously as practicable,” per the provision establishing the attainment deadlines, why is it not also generally necessary for upwind States to satisfy their good neighbor obligations by the ultimate attainment deadline as a last resort, per the same provision? By structuring the Update Rule to require upwind States to meet their good neighbor requirements as expeditiously as practicable, but then permitting States to continue their significant contributions well past the attainment deadlines, EPA gives effect to the “expeditiously as practicable” part of § 7511(a) without giving any independent effect to the deadlines part of that provision.

EPA argues that the § 7511(a) attainment deadlines need not carry over to the Good Neighbor Provision because those deadlines are subject to modification by other statutory provisions. But those modification provisions do not render the deadlines discretionary or otherwise rob them of legal force. *See Sierra Club*, 294 F.3d at 161 (holding that “§ 7511(a)(1), as written[,], sets a deadline without an exception”). Rather, if a modified attainment deadline applies to downwind States, EPA may be able, if justified, to make a corresponding extension for an upwind State’s good neighbor obligations. EPA makes no contention that any such modification is applicable here.

As a last argument, EPA contends that holding upwind States to the downwind attainment deadlines would be inconsistent with the timeframe for promulgating a FIP. Under

the Act, the first downwind attainment deadline can occur within five years of the establishment of an ozone NAAQS. *See* 42 U.S.C. § 7407(d)(1)(B)(i); § 7511(a)(1). But, EPA notes, the statute contemplates that it might take more than six years to promulgate a FIP. *See id.* § 7410(a)(1), (c)(1), (k)(1)(B), (k)(2). Thus, EPA submits, upwind States cannot have been expected to cease their significant contributions by the downwind attainment deadline.

There is no inconsistency. Under the statute, EPA need not wait six years to issue a FIP. By shortening the deadline for a SIP submission, *see id.* § 7410(a)(1), and by issuing a FIP soon thereafter, *see id.* § 7410(c)(1), EPA could promulgate a FIP well before the first downwind attainment deadline. *See EME Homer II*, 572 U.S. at 509 (“After EPA has disapproved a SIP, the Agency can wait up to two years to issue a FIP But EPA is not obliged to wait two years or postpone its action even a single day.”).

EPA’s argument, in this regard, also proves too much. By EPA’s logic, EPA can wait until after the nonattainment deadline to promulgate not only a FIP addressing unfulfilled good neighbor obligations, but also a FIP addressing in-State pollution control deficiencies. After all, the same provisions EPA cites here also appear to allow EPA to take six years to promulgate a FIP after finding that a State’s SIP will not bring that same State into attainment. *See* 42 U.S.C. § 7410(k)(1)(A) (FIPs may be promulgated when Administrator decides that a SIP does not “compl[y] with the provisions of this chapter”). This would suggest that no pollution control requirement, let alone the Good Neighbor Provision, need be complied with by the attainment deadline. Yet EPA does not suggest that the timeframes for a FIP somehow render the deadlines totally nonbinding. When EPA determines that a State’s SIP is inadequate, EPA presumably must issue a FIP

that will bring that State into compliance before upcoming attainment deadlines, even if the outer limit of the statutory timeframe gives EPA more time to formulate the FIP. *See Sierra Club v. EPA*, 294 F.3d 155, 161 (D.C. Cir. 2002) (“the attainment deadlines remain intact” even if procedural deadlines are missed or changed). The same is true when a State’s SIP fails to provide for the full elimination of the State’s significant contributions to downwind nonattainment.

For these reasons, we conclude that, by issuing a Rule that does not call for upwind States to eliminate their substantial contributions to downwind nonattainment in concert with the attainment deadlines, EPA has strayed outside the bounds of its statutory authority under the Good Neighbor Provision.

3

EPA invokes various justifications for allowing substantial upwind contributions to continue beyond the downwind attainment deadlines. None of the agency’s asserted justifications establishes cause to disregard the requirement under the statute to align the deadline for satisfying good neighbor obligations with the deadline for attaining the NAAQS.

First, EPA opted to require partial (rather than full) satisfaction of upwind States’ good neighbor obligations due in significant part to its decision to consider only upwind emissions from EGUs. EPA decided against considering emissions reductions from non-EGUs because, “[a]s compared to EGUs, there is greater uncertainty in EPA’s current assessment of non-EGU point-source NO_x mitigation potential.” 81 Fed. Reg. at 74,542; *see id.* at 74,521.

Scientific uncertainty, however, does not excuse EPA's failure to align the deadline for eliminating upwind States' significant contributions with the deadline for downwind attainment of the NAAQS. "Questions involving the environment are particularly prone to uncertainty," but "the statutes and common sense demand regulatory action to prevent harm, even if the regulator is less than certain." *Ethyl Corp. v. EPA*, 541 F.2d 1, 24–25 (D.C. Cir. 1976) (en banc). As a result, "EPA [cannot] avoid its statutory obligation by noting [scientific] uncertainty . . . and concluding that it would therefore be better not to regulate at this time." *Massachusetts v. EPA*, 549 U.S. 497, 534 (2007). It is only when "the scientific uncertainty is so profound that it precludes EPA from making a reasoned judgment" that it can excuse compliance with a statutory mandate. *Id.* But to invoke that exception, EPA "must say so," and it has not said so here. *Id.*

The agency also concluded that "developing a rule that would have covered additional sectors and emissions reductions on longer compliance schedules would have required more of the EPA's resources over a longer rulemaking schedule." 81 Fed. Reg. at 74,522. But administrative infeasibility, like scientific uncertainty, cannot justify the Update Rule's noncompliance with the statute.

An agency cannot "shirk[] its duties by reason of mere difficulty or inconvenience." *Am. Hosp. Ass'n v. Price*, 867 F.3d 160, 168 (D.C. Cir. 2017). When an agency faces a statutory mandate, a decision to disregard it cannot be grounded in mere infeasibility. Rather, the agency would need to meet the "heavy burden to demonstrate the existence of an impossibility." *Sierra Club v. EPA*, 719 F.2d 436, 462 (D.C. Cir. 1983) (quoting *Ala. Power Co. v. Costle*, 636 F.2d 323, 359 (D.C. Cir. 1979)).

EPA has not attempted to meet that burden here. True, EPA would need to devote “more of the EPA’s resources” in order to quantify good neighbor obligations from non-EGU sources. 81 Fed. Reg. at 74,522. And “greater uncertainty” about reductions from non-EGUs might render EPA’s calculations more inaccurate than it would prefer. *Id.* at 74,542. But that does not amount to impossibility.

EPA next contends that it should be permitted to address a problem incrementally, one step at a time. EPA relies on two of our decisions for support. First, in *Grand Canyon Air Tour Coal. v. FAA*, 154 F.3d 455 (D.C. Cir. 1998), we affirmed an FAA rule that only partly fulfilled the agency’s statutory obligation to “restor[e] the natural quiet” to the Grand Canyon, *id.* at 460. We were careful to note, however, that “Congress had no specific timetable in mind.” *Id.* at 477. The opposite is true here—in fact, Congress has provided a literal timetable. See 42 U.S.C. § 7511(a)(1). Second, in *Las Vegas v. Lujan*, 891 F.2d 927 (D.C. Cir. 1989), we sustained the Interior Secretary’s decision to list only one of two similar species of tortoise as endangered, observing that “agencies have great discretion to treat a problem partially,” *id.* at 935. But the Endangered Species Act does not require the Secretary to list all endangered species by a date certain. The Clean Air Act requires upwind States to eliminate their significant contributions to downwind ozone nonattainment by prescribed deadlines.

Finally, EPA cites delays occasioned by litigation. EPA observes that its legal obligations under the Good Neighbor Provision remained uncertain until the Supreme Court issued its April 2014 decision in *EME Homer II*. And this court’s ensuing decision in *EME Homer III* in July 2015 imposed further obligations on EPA by invalidating budgets for certain States. EPA released its Proposed Rule six months later, in

December 2015, and it released the Final Rule several months thereafter, in October 2016. In this context, litigation delays cannot justify EPA's failure to bring the deadline for satisfying good neighbor obligations into alignment with the 2018 attainment deadline. The timeframes do not amount to "the existence of an impossibility." *Sierra Club*, 719 F.2d at 462.

While EPA has not justified its failure to align the deadline for upwind States to eliminate significant contributions with the deadline for downwind areas to attain the NAAQS, the agency retains some flexibility in administering the Good Neighbor Provision. We acknowledge that the "realities of interstate air pollution . . . are not so simple," and EPA faces its share of "thorny . . . problem[s]" in regulating it. *EME Homer II*, 572 U.S. at 514–16. EPA, though, possesses a measure of latitude in defining which upwind contribution "amounts" count as "significant[]" and thus must be abated. *See id.* at 518; 520 n.21. And the Supreme Court has indicated that EPA can take into account, among other things, "the magnitude of upwind States' contributions and the cost associated with eliminating them." *Id.* at 518. Additionally, in certain circumstances, EPA can grant one-year extensions of the nonattainment deadlines to downwind States. 42 U.S.C. § 7511(a)(5). EPA grants those extensions fairly commonly. *E.g.*, 84 Fed. Reg. 44238, 44238 (Aug. 23, 2019); 81 Fed. Reg. 26,697, 26,697 (May 4, 2016). And finally, EPA can always attempt to show "impossibility." *Sierra Club*, 719 F.2d at 462.

It also bears reemphasizing that the Update Rule set no deadline at all for upwind States to eliminate their significant contributions (a result even more infirm than the five-year extension struck down in *North Carolina*). We do not foreclose the possibility that the statutory command we construe here—that compliance with the Good Neighbor

Provision must be achieved in a manner “consistent with” Title I—might reasonably be read, under particular circumstances and upon a sufficient showing of necessity, to allow some deviation between the upwind and downwind deadlines. Any such deviation would need to be rooted in Title I’s framework, *cf.* 42 U.S.C. § 7511(a) (allowing one-year extension of attainment deadlines in particular circumstances), and of course would still need to “provide a sufficient level of protection to downwind States,” *North Carolina*, 531 F.3d at 912. What EPA cannot do, in our view, is determine that upwind States contribute to downwind nonattainment in a manner the agency deems “significant,” but then still allow those upwind contributions to persist out of step with the deadline for downwind areas to come into attainment.

B

Environmental Petitioners also challenge various of the Update Rule’s modeling and implementation choices. We are “at [our] most deferential” when reviewing an agency’s predictions and scientific determinations. *Balt. Gas & Elec. Co. v. Nat. Res. Def. Council, Inc.*, 462 U.S. 87, 103 (1983). We find no basis to set aside the challenged determinations here.

First, Environmental Petitioners challenge EPA’s assumption that turning on idled “Selective Catalytic Reduction” (SCR) controls would reduce an EGU’s emissions to 0.10 lbs/mmBtu. They contend that a lower rate would be more accurate, and they argue that EPA failed to provide a reasoned explanation for its choice. We conclude that EPA adequately explained its choice. EPA acknowledged that certain units could achieve a lower emissions rate with SCR, but determined that the higher rate was “generally achievable” and therefore more “appropriate” for EPA’s model, especially

because it calculated a rate on a fleet-wide basis. 81 Fed. Reg. at 74,544. Additionally, EPA applied a unit's historical rate whenever it was lower. That explanation is "rational." *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 56 (1983).

Second, Environmental Petitioners challenge EPA's choice to limit its modeling to include only intrastate generation shifting (*i.e.*, the shifting of electricity generation to cleaner power plants). Broader consideration of generation shifting, they argue, would have yielded greater potential emissions reductions. But EPA limited its modeling to intrastate generation shifting because it thought "broader" generation shifting would ignore near-term technological feasibility. See 81 Fed. Reg. at 74,544–45. And EPA rejected Environmental Petitioners' preferred modeling approach because it ignored the relevance of cost thresholds, rendering it incompatible with an approach to modeling premised on uniform cost-control thresholds. See Response to Comments at 528, J.A. 572. Again, EPA's choices were rational.

Third, Environmental Petitioners challenge EPA's approach to converting allowances from previous allowance trading programs. The Update Rule employs an allowance trading program, which permits underpolluting EGUs to sell unused allowances to overpolluting EGUs. Because this Rule is more stringent than prior rules, it imposes a conversion formula to mitigate the impact of plants losing out on allowances banked under prior rules. The formula results in a conversion ratio of approximately 3.5 old allowances per 1 new allowance. See 81 Fed. Reg. at 74,557.

Environmental Petitioners say that EPA's approach will create an "allowance glut" that will hinder the Rule's salutary effect on upwind emissions. In their view, EPA should have

declined to allow any conversion of old allowances. EPA's considered judgment, however, was that some conversion of allowances was necessary to respect EGUs' legitimate "expectation that . . . banked allowances will have some value in the future of th[e] program." *Id.* at 74,561. And if no conversion were permitted, current EGUs would have the incentive to use up their banked allowances all at once, exacerbating downwind nonattainment problems. EPA has demonstrated that its use of a 3.5-to-1 conversion ratio was reasonable.

Environmental Petitioners last raise a statutory challenge. The Rule's banked allowance program, they submit, contradicts EPA's statutory obligation to implement Good Neighbor emissions reductions "as expeditiously as practicable." 42 U.S.C. § 7411(a)(1). That challenge fails under *Chevron*. The Good Neighbor Provision does not speak directly to these choices. It is unclear, for example, whether the Provision requires a conversion ratio of 3.5 to 1, a different ratio, or no conversion at all. EPA's choices are reasonable and merit deference. Our precedents read the Good Neighbor Provision to grant EPA the authority to make precisely those kinds of policy determinations. *See, e.g., EME Homer III*, 795 F.3d at 135.

C

Delaware claims that it should have been designated a nonattaining downwind State, triggering good neighbor obligations from upwind States. Under EPA's projections for 2017, no Delaware receptors were deemed problem receptors because both average and maximum projected ozone concentrations fell below 76.0 ppb. But under the Act, upwind States' SIPs—with corresponding Good Neighbor emissions reductions—were initially due in 2011. *See* 42 U.S.C.

§ 7410(a)(1). Thus, Delaware argues, the Update Rule must use 2011 data, not 2017 data, to designate receptors as problem receptors. Otherwise, States upwind of nonattainment areas in 2011 can pollute without consequence, so long as those downwind areas come into attainment by 2017.

Delaware's argument leans too heavily on the SIP submission deadline. SIP submission deadlines, unlike attainment deadlines, are "procedural" and therefore not "central to the regulatory scheme." *Sierra Club*, 294 F.3d at 161. Nor can Delaware's argument be reconciled with the text of the Good Neighbor Provision, which prohibits upwind States from emitting in amounts "which *will*" contribute to downwind nonattainment. 42 U.S.C. § 7410(a)(2)(D)(i) (emphasis added). Given the use of the future tense, it would be anomalous for EPA to subject upwind States to good neighbor obligations in 2017 by considering which downwind States were once in nonattainment in 2011.

Delaware also claims that EPA impermissibly relied on only one year of modeling data to designate downwind problem receptors. That argument mischaracterizes EPA's methodology. The Update Rule relies on a weighted average of *three* design values (from 2009–2011, 2010–2012, and 2011–2013) in order to compute projected concentrations at each downwind receptor for 2017. *See* 81 Fed. Reg. at 74,532. Delaware's challenge thus fails.

III

In contrast to Environmental Petitioners and Delaware, State and Industry Petitioners argue that the Update Rule—far from doing too little to curb interstate air pollution—unlawfully *overregulates* upwind emissions sources. They

present a smörgåsbord of arguments, which we address below.

A

State Petitioners contend that EPA failed to rationally analyze whether the environmental benefits of the Rule's FIPs justified their costs, and that the agency thus contravened the Good Neighbor Provision and principles of administrative law. The Good Neighbor Provision, State Petitioners note, authorizes EPA to regulate emissions that “contribute *significantly* to nonattainment.” State Pet’rs’ Br. 14 (quoting 42 U.S.C. § 7410(a)(2)(D)(i)) (emphasis in original). And in *Michigan v. EPA*, 213 F.3d 663 (D.C. Cir. 2000), State Petitioners add, we held that EPA may consider costs in determining what contributions are “significant,” *id.* at 15 (quoting *Michigan*, 213 F.3d at 675), and endorsed the principle that (in the absence of a clear legislative statement to the contrary) a regulation’s benefits must be “at least roughly commensurate with [its] costs,” *id.* (quoting *Michigan*, 213 F.3d 678–79). Accordingly, State Petitioners conclude, the Rule is unlawful because it irrationally subjects all regulated States to costly FIPs, which impose a uniform \$1,400/ton control level on emissions sources, even if a FIP for a given State forecasts *de minimis* emissions reductions. For example, State Petitioners point out, the FIP that the Rule imposes on Wisconsin projects to reduce the state’s emissions impact on the sole downwind receptor to which it is linked by just two ten-thousandths of a part per billion.

State Petitioners’ argument fails. As they tell it, in promulgating the Rule, EPA threw cost consideration to the wind and rashly required certain states, like Wisconsin, to expend great costs to achieve insignificant environmental benefits. But the record belies this narrative. Indeed, EPA settled on the Rule’s \$1,400/ton control level precisely

because, the agency found, it maximized air quality improvement achieved per increment of additional cost. 81 Fed. Reg. at 74550. Moreover, for states like Wisconsin, for which the Rule admittedly predicts relatively few emissions reductions, the Rule imposes relatively few costs. This is because—as State Petitioners themselves explain—such States “have already incorporated [most of] the [control] technology available at \$1,400 or less.” States’ Reply Br. 6. In addition, with respect to such States, EPA determined that the Rule’s projected emissions reductions are significant (even if they appear modest relative to other regulated States’ projected reductions), because any State subject to the Rule is contributing at least one percent of the 2008 ozone NAAQS to at least one downwind problem receptor. For these reasons, the Supreme Court held that the original CSAPR, which relied on a virtually identical uniform control level methodology, was a “cost-effective . . . permissible . . . and equitable interpretation of the Good Neighbor Provision.” *EME Homer II*, 572 U.S. at 524. State Petitioners fail to persuade us that the Update Rule is anything different.

B

State Petitioners argue next that the Rule is unlawful because, in quantifying upwind emissions, EPA’s source apportionment model included ozone from biogenic (*i.e.*, naturally occurring) sources. This contravenes the Good Neighbor Provision, State Petitioners contend, because the statute authorizes the agency to regulate only “emissions activity,” *i.e.*, anthropogenic (or human-caused) emissions. State Pet’rs’ Br. 38 (quoting 42 U.S.C. § 7410(a)(2)(D)(i)) (emphasis in original). State Petitioners add that EPA implicitly recognizes this limit on its authority, because the agency stated in the Rule that at step two it sought to “quantify

the contributions from anthropogenic emissions from upwind states.” *Id.* (quoting 81 Fed. Reg. at 74,526).

Assuming without deciding that the Good Neighbor Provision authorizes EPA to regulate only human-caused emissions,¹ State Petitioners’ argument nevertheless fails. As EPA explains, ozone is formed when ozone precursors, such as NO_x and VOCs, react to one another in the presence of sunlight. 81 Fed. Reg. at 74,513. Ozone precursors are emitted from both anthropogenic and biogenic sources. *Id.* It is possible, therefore, for ozone to form from purely biogenic precursors, purely anthropogenic precursors, or a mix of both. *See id.* at 74,536 n.123. State Petitioners complain that the Rule’s source apportionment model contravened the Good Neighbor Provision in classifying ozone formed from a mix of biogenic and anthropogenic precursors as anthropogenic ozone, which the Rule requires upwind States to reduce. We, however, see no problem with this, because ozone formed from a mix of biogenic and anthropogenic precursors *is* a product of human-caused emissions. True, such ozone is only partially anthropogenic. But Industry Petitioners point to no authority indicating that the Good Neighbor Provision authorizes EPA to regulate only emissions that are *entirely* attributable to human activity. Moreover, EPA rationally explained that it selected the Rule’s particular source apportionment model (as opposed to a model that provided a separate classification for ozone formed from a mix of anthropogenic and biogenic precursors) because, in the agency’s view, it was the more appropriate of the available source apportionment tools. *Id.* at 74,536. That is because it assigned culpability for downwind ozone to specific upwind sources of emissions in a manner that best advances the Good Neighbor Provision’s essential purpose of

¹ EPA does not contest this assertion, but State Petitioners point to no authority that definitively establishes its truth.

curbing interstate air pollution. *Id.* We defer, therefore, to EPA's modeling choice. *Nat'l Ass'n of Mfrs. v. U.S. Dep't of Interior*, 134 F.3d 1095, 1103 (D.C. Cir. 1998) (“[An] agency’s choice of model . . . must be respected when the record discloses that the agency examined the relevant data and articulated a reasoned basis for its decision.”).²

C

We turn next to Industry Petitioners’ arguments that certain aspects of the Rule’s methodology contravene *EME Homer II*’s prohibition on overcontrol, which proscribes EPA from requiring a State to reduce emissions below one percent of the relevant NAAQS or by more than is necessary to achieve attainment at every downwind receptor to which a state is linked. *EME Homer II*, 572 U.S. at 521. First, Industry Petitioners argue that “many” downwind problem receptors would have attained the NAAQS had the Rule excluded emissions attributable to international sources. Indus. Pet’rs’ Br. 16. Second, Industry Petitioners contend, had the Rule accounted for emissions reductions required of States subject to the Rule but not linked to a given problem receptor, a reviewing court would be “far likelier” to find that the Rule overcontrols problem receptors in general. *Id.* at 19. Third, Industry Petitioners assert, because the Rule did not reflect reasonably expected downwind controls, “some” of the upwind

² In a related argument, State Petitioners theorize that the Rule double counts any ozone produced from a combination of biogenic and anthropogenic sources because, even if the anthropogenic half were to be reduced, the lingering biogenic partner would still react with other biogenic sources to form ozone. State Pet’rs’ Br. 38–39. But as EPA points out, this argument was never raised before the agency. EPA’s Br. 71. Because it has not been preserved, we need not address it. *See Nuclear Energy Inst.*, 373 F.3d at 1290.

emissions reductions that it requires “may be unnecessary.” *Id.* at 23.

None of Industry Petitioners’ arguments succeed. As for emissions from international sources, Industry Petitioners are simply wrong that the Rule “identif[ies] as ‘problem’ receptors many whose problems were actually attributable not to upwind-state but to non-U.S. emissions.” Indus. Pet’rs’ Br. 16–17. That logic incorrectly assumes that an upwind State “contributes significantly” to downwind nonattainment only when its emissions are the *sole cause* of downwind nonattainment. But an upwind State can “contribute” to downwind nonattainment even if its emissions are not the but-for cause. After all, “[m]any (or perhaps all) receptors would *also* attain the NAAQS if all in-state contributions were eliminated, *or* if all upwind contributions were eliminated, *or* if all non-anthropogenic contributions were eliminated.” EPA’s Br. 65. Under Industry Petitioners’ position, EPA could not require emissions reductions from any of those sources because each of them could point the finger at the others. *See also Catawba County v. EPA*, 571 F.3d 20, 39 (D.C. Cir. 2009) (rejecting the argument “that ‘significantly contribute’ unambiguously means ‘strictly cause’” because there is “no reason why the statute precludes EPA from determining that [an] addition of [pollutant] into the atmosphere is significant even though a nearby county’s nonattainment problem would still persist in its absence”); *Miss. Comm’n on Env’tl. Quality v. EPA*, 790 F.3d 138, 163 n.12 (D.C. Cir. 2015) (observing that the argument that “there likely would have been no violation at all . . . if it were not for the emissions resulting from [another source]” is “merely a rephrasing of the but-for causation rule that we rejected in *Catawba County*”).

Industry Petitioners' other arguments fail because they are too particularized. As we emphasized in *EME Homer III*, for challengers who raise the possibility of overcontrol in only a few instances, "the Supreme Court has made clear . . . that the way to contest instances of over-control is not through generalized claims that EPA's methodology would lead to over-control, but rather through a 'particularized, as-applied challenge.'" *Homer III*, 795 F.3d at 137 (quoting *EME Homer II*, 572 U.S. 523–24). Accordingly, as we did when presented with similar arguments in *EME Homer III*, we reject Industry Petitioners' arguments because they do no more than speculate that aspects of "EPA's methodology *could* lead to over-control of upwind States." *Id.* at 136–37.

D

As noted in Part I, *supra*, in order to implement upwind States' good neighbor obligations, EPA devised a detailed process to determine whether downwind pollution receptors were in attainment, maintenance, or nonattainment status. Under this framework, EPA identified thirteen maintenance receptors. 81 Fed. Reg. at 74,533. Nine of those thirteen measured in attainment, in that their most recent monitored design value complied with the NAAQS. *Id.* Four upwind States—Iowa, Kentucky, Tennessee, and Wisconsin—were linked exclusively to one or more of those nine maintenance receptors. *Id.* at 74,538–39.

Industry Petitioners take two jabs at the Update Rule's definition of "maintenance" receptors and its treatment of States linked exclusively to them. First, they say EPA deviated unreasonably from past agency practice in designating receptors as maintenance, even when they monitored in attainment. Second, they claim that imposing a single uniform \$1,400/ton control level on all upwind States necessarily leads

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to overcontrol of those States linked exclusively to maintenance receptors. See Indus. Pet'r's Br. 8–15, 25–26. Neither argument succeeds.

1

Industry Petitioners accept, as they must, that EPA was permitted to base its designations, at least in part, on predictions about the state of air quality in 2017. See *North Carolina*, 531 F.3d at 913–14 (affirming as reasonable EPA's interpretation of “will” in the Good Neighbor Provision as “indicat[ing] the future tense”).

Industry Petitioners' first objection is that the agency's exclusive reliance on projections constitutes an unreasonable deviation from its past practice of relying on a combination of modeled and monitored data. 63 Fed. Reg. 57,356, 57,375 (Oct. 27, 1998) (NO_x SIP Call) (relying on both monitored *and* modeled data); *accord* 70 Fed. Reg. 25,162, 25,241 (May 12, 2005) (CAIR); *cf.* 76 Fed. Reg. 48,208, 48,230 (Aug. 8, 2011) (explaining that EPA had to “drop[]the ‘monitored’ part of the modeled + monitored test” only because “the most recent monitoring data” reflected effects of the unlawful Clean Air Interstate Rule).

Our decision in *North Carolina* squarely forecloses that argument, and its reasoning fully explains the agency's purported switch to reliance only on projected air quality. The Good Neighbor Provision directs EPA to regulate emissions that both “contribute significantly to nonattainment,” and also “interfere with maintenance,” of air quality standards. See 42 U.S.C. § 7410(a)(2)(D)(i); *North Carolina*, 531 F.3d at 909–10. In *North Carolina*, EPA had interpreted the Good Neighbor Provision's maintenance prong narrowly, as ensuring only against retrogression by previously nonattaining

receptors. *Id.* at 910. This court overturned that interpretation because it failed to give “independent effect” to the “interfere with maintenance” prong, leaving those areas “barely meeting attainment” without any “recourse” against upwind States’ contamination of their air quality. *Id.*; accord *EME Homer II*, 572 U.S. at 516 n.18 (describing EPA’s duty to “reduce” emissions from upwind States sufficient to ensure that “*an already-attaining State* [maintains] satisfactory air quality”) (emphasis added); *EME Homer III*, 795 F.3d at 136 (explaining that EPA rule “afford[ed] independent effect to the ‘interfere with maintenance’ prong”).

EPA’s Rule does what the rule in *North Carolina* did not. It gives effect to the upwind States’ independent duty not to impede downwind States’ maintenance of air quality standards. As EPA explained, “the possibility of failing to maintain the NAAQS in the future, even in the face of current attainment of the NAAQS, is exactly what the maintenance prong of the good neighbor provision is designed to guard against.” 81 Fed. Reg. at 74,531. So the Rule’s designation method for maintenance receptors was reasonable, and its decision to change its approach to protect receptors in maintenance status was a sensible response to *North Carolina*’s requirement that EPA give full effect to the statute’s distinct maintenance command. See 42 U.S.C. § 7410(a)(2)(D)(i).

As for State Petitioners’ insistence that EPA should have relied on a combination of monitored and modeled data, that argument overlooks that the agency’s projections were predicated directly upon monitored data from 2009–2013. See 81 Fed. Reg. at 74,532. Any standard more demanding—a requirement, for example, that maintenance receptors actually monitor in nonattainment between 2013–2015—would run headlong into *North Carolina*’s directive that EPA give “independent effect” to the

maintenance prong. *North Carolina*, 531 F.3d at 909.

As previously noted, EPA applied a uniform cost threshold of \$1,400/ton to identify necessary emission reductions in contributing upwind States. In other words, the Rule requires that States deploy all available technologies capable of reducing emissions at a cost of \$1,400 or less per ton of NO_x reduced. 81 Fed. Reg. at 74,541.

Industry Petitioners contend that this uniform control threshold led to overcontrol in the four States linked exclusively to maintenance receptors (rather than to receptors showing nonattainment). Indus. Pet'rs' Br. 25–26. Specifically, after *EME Homer II*, the maintenance prong only authorizes EPA to “limit emissions ‘by just enough to permit an already-attaining State to maintain satisfactory air quality.’” *EME Homer III*, 795 F.3d at 137 (quoting *EME Homer II*, 572 U.S. at 515 n.18).

Industry Petitioners say the agency's approach ran afoul of that mandate in two interrelated ways. First, for States linked exclusively to maintenance-only receptors, they argue that their existing upwind emission levels are by definition compatible with attainment in the downwind States, so that any additional reductions beyond “existing . . . levels” constitute overcontrol. Indus. Pet'rs' Br. 26. Second, Industry Petitioners contend that, as a conceptual matter, if the \$1,400/ton control level were sufficient to resolve issues at *nonattainment* receptors, then that same standard would, by definition, lead to overcontrol of those States linked exclusively to *maintenance* receptors. *Id.* at 25–26.

Both arguments fail because they ignore key aspects of the agency's reasoning. Industry's insistence that current levels suffice for maintenance wrongly assumes that maintenance receptors will violate the NAAQS only if upwind emissions increase beyond the existing baseline. But things are not that simple. Variations in atmospheric conditions and weather patterns can bring maintenance receptors into nonattainment even *without* elevated emissions. See 81 Fed. Reg. at 74,513–14, 74,532, 74,537–38.

Likewise, the argument that the uniform control standard necessarily overshoots for maintenance receptors presupposes that the Update Rule fully satisfies upwind States' Good Neighbor responsibilities. Not so—as the Rule repeatedly self-describes, it is only a partial remedy. See, e.g., 81 Fed. Reg. at 74,505, 74,508, 74,520–22.

More fundamentally, as we discussed with respect to Industry Petitioners' over-particularized claims of overcontrol, these arguments fail to identify a single “*actual* . . . instance[] of over-control,” which is what *EME Homer II* calls for. *EME Homer III*, 795 F.3d at 137 (emphasis added) (interpreting *EME Homer II*, 572 U.S. at 523–24). In the Update Rule, EPA conducted a rigorous overcontrol analysis, and concluded that even with the new \$1,400/ton control level, only a small subset of maintenance and nonattainment receptors were projected to succeed in fully resolving their air quality problems. See 81 Fed. Reg. at 74,551–74,552. Of all the upwind States, only Tennessee was linked exclusively to those fully resolved receptors. *Id.* And even then, the agency confirmed that problems at Tennessee's linked receptors could not be resolved at a less stringent level of control. *Id.* As this record illustrates, where evidence of “actual” overcontrol is needed, Industry Petitioners' conceptual objections alone cannot suffice. See *EME Homer II*, 572 U.S. at 515 n.18.

E

State Petitioners challenge EPA's use of a grid-cell approach for identifying maintenance and nonattainment receptors. State Pet'rs' Br. 24–29. EPA uses that method to calculate a monitor's relative response factor. It does so by putting the monitor at the center of a twelve-square-kilometer grid, which consists of nine four-square-kilometer cells, and then analyzing the air quality in each of the individual cells. 81 Fed. Reg. at 74,526–27. For “coastal” monitors near the ocean, the grids included “offshore” cells in the air quality measurements. *See id.* at 74,534.

State Petitioners claim that these offshore cells artificially inflated projected ozone concentrations at the coastal monitors, and that Iowa and Wisconsin were linked exclusively to those misidentified air quality strugglers. State Pet'rs' Br. 24–29; 81 Fed. Reg. at 74,534, 74,538–39 (Tables V.E-2, V.E-3). In the States' view, EPA should have based its designation decisions on data derived solely from the cell in which the monitor was located or from all of the over-land cells within the grid. State Pet'rs' Br. 24–29.

That objection fails for four reasons.

First, the agency offered a reasonable explanation for why its grid-cell approach was “most representative” of onshore ozone concentration levels. For starters, these models can be imprecise at the “grid cell level”—that is, small variations in the model may influence whether ozone is shown to form in one particular cell rather than its neighbor. 81 Fed. Reg. at 74,534. That precision problem is further compounded by the fact that monitors are often located close to the border of several cells. *Id.* Taking those two problems into account, the agency reasonably worried that it would miss data “most

representative” of ozone concentrations, if it were to disregard high concentrations in neighboring cells and focus exclusively on the individual monitor cell. *See id.*; *EME Homer III*, 795 F.3d at 135 (describing the considerable “deferen[ce]” owed to agency “modeling choices”).

Second, EPA found that over-water ozone often blows onto the land above coastal monitors, and so capturing that input is critical to accurately gauging air quality in the monitor area. 81 Fed. Reg. at 74,534; *North Carolina*, 531 F.3d at 925 (affording “substantial deference to EPA’s technical expertise”).

Third, the accuracy of EPA’s judgment is confirmed by the fact that, even under State Petitioners’ single-cell approach, the lone receptor to which Iowa and Wisconsin are linked would still demonstrate maintenance, and thus a need to preserve that status. *Cf.* 81 Fed. Reg. at 74,534–35. Having pressed the single-cell approach on the agency, State Petitioners cannot seriously complain about a methodology that produced a functionally identical result.

Fourth, trying a different tack, State Petitioners latch onto *Michigan v. EPA*’s command that the agency regulate only “onshore state nonattainment.” 213 F.3d at 681. But Petitioners omit critical context. In *Michigan*, we struck Wisconsin’s inclusion in a downwind attainment plan because EPA had shown only that Wisconsin contributed significantly to nonattainment in Lake Michigan itself. The record did not reveal a downwind contribution to “any other State[.]” *Id.* at 681 (quoting 42 U.S.C. § 7410(a)(2)(D)(i)(I)). The fatal blow for EPA’s approach was when the agency “conceded” at oral argument that it had provided no record “explanation to support” a linkage “between the Lake Michigan receptor area and the onshore states.” *Id.* (internal quotation marks omitted).

EPA was careful not to make that same mistake a second time. So here, EPA explained carefully and on the record how data from those offshore cells could be reasonably probative of air quality at any given coastal receptor. *See* 81 Fed. Reg. at 74,534. *Michigan* is not the categorical bar Petitioners describe, and EPA's approach was fully consistent with its holding.³

F

Industry Petitioners next complain that EPA failed to fully consider the emissions-reducing effects of a 2016 Pennsylvania rule. Indus. Pet'rs' Br. 17–18. That argument falls wide of the mark.

EPA took into account State-level efforts to reduce emissions when forecasting 2017 air quality during the rulemaking process. But for reasons of modeling-reliability, EPA included only those State emissions rules in effect through February 1, 2016. 81 Fed. Reg. at 74,528 n.108. That was EPA's "cutoff date" because, after February 1, 2016, "it [would] no longer [be] possible to incorporate updates into the input databases" before EPA had to run the model. *Id.*

³ In a footnote, Industry Petitioners argue that Arkansas, Mississippi, and Pennsylvania were also negatively affected by the inclusion of offshore cells because those States were linked to monitors located in close proximity to large bodies of water. Indus. Pet'rs' Br. 29 n.15. But that lone, underdeveloped footnote does not even show whether these States were actually impacted by the agency's methodology. In any event, " cursory arguments made only in footnotes" generally do not preserve an issue, and there is no reason to make an exception here. *Abdelfattah v. U.S. Dep't of Homeland Sec.*, 787 F.3d 524, 532 (D.C. Cir. 2015) (formatting modified).

In April 2016—several months after that cutoff date—Pennsylvania finalized a rulemaking to implement “Reasonably Available Control Technology” (“Control Technology”) that was designed to limit the emission of NO_x and VOCs. That rule was scheduled to be implemented on January 1, 2017, almost a year after EPA’s modeling window had closed.

While unable to include the Pennsylvania rule in its modeling, EPA acknowledged its potential magnitude, and so chose to conduct a “robust separate analysis to evaluate [the Control Technology’s] impacts.” EPA, Memorandum on Pennsylvania Rulemaking, J.A. 463. That study concluded that the Pennsylvania rule did “not affect EPA’s identification of [any] nonattainment or maintenance receptors.” *Id.*, J.A. 465.

Industry Petitioners now fault the agency for considering only the rule’s effect on NO_x emissions, while ignoring its (far more modest and unquantified) effect on emissions of VOCs. That argument is a nonstarter. First off, Industry Petitioners fail to explain how the agency could have figured reductions in VOCs emissions into its analysis since the Pennsylvania rule makes no effort to quantify them.

Anyhow, the regulated electric utilities, which account for the majority of the Control Technology’s emission reductions, were projected to emit almost sixty times more NO_x than VOCs in the absence of the Pennsylvania rulemaking. Given that even the reductions in NO_x had no appreciable effect on EPA’s receptor designations, it was perfectly reasonable for the agency to conclude that factoring in the even more nominal effects of VOCs regulation would not be worth the candle. *Cf. Thompson v. Clark*, 741 F.2d 401, 408 (D.C. Cir. 1984) (The Administrative Procedure Act “has never been interpreted to

require the agency to . . . analyse [*sic*] every . . . alternative raised by the comments, no matter how insubstantial.”). For those reasons, EPA’s decision was well within legal bounds.

G

Industry Petitioners lodge several objections to EPA’s methodology for calculating States’ emissions budgets. But a comprehensive picture of the agency’s approach exposes where those arguments fall short.

EPA’s \$1,400/ton control level reflects the costs associated with turning on idled selective catalytic reduction equipment, as well as with the installation of “state-of-the-art combustion controls,” like “low-NO_x burners” and “over-fire air.” 81 Fed. Reg. at 74,541.⁴ EPA used an Integrated Planning Model (“Integrated Model”) that simulated the electricity market to project both (i) a “baseline case” of what 2017 emissions would be without any additional pollution controls, *id.* at 74,528, 74,532; and (ii) a “control case” that incorporated the selective catalytic reduction and combustion control equipment, *see id.* at 74,541, 74,548–49 (Tables VI.C-1-2).

In setting a given State’s emissions budget, the agency took the difference between the baseline and control cases—what it calls the “relative-rate delta”—and subtracted it from the State’s actual 2015 emission rate. 81 Fed. Reg. at 74,547–48. That emissions rate—expressed in terms of pounds of NO_x per one million British thermal units of emitted heat (“lbs/mmBtu”)—was then multiplied by the State’s 2015 heat

⁴ Selective catalytic reduction takes place when a reagent is injected into a pollutant gas flue, inducing a chemical reaction that transforms the pollutant into a more palatable chemical or chemicals. *See* J.A. 1462–66.

input to produce the individual State emissions budget. *Id.* at 74548–49 (Tables VI.C-1-2). Industry Petitioners challenge several steps in the analysis, but none of their arguments succeed.

First, they claim that EPA was unrealistic to expect that the relevant emission controls could be fully installed during the less-than-eight-month period between when the Update Rule was finalized and when it was set to take effect. They say at least eighteen months is needed, citing supporting anecdotes.

But all those anecdotes show is that installation can drag on when companies are unconstrained by the ticking clock of the law. That does not establish how much time is technically *required* to complete installation. EPA reasonably based its determination on a real-world example identified during an earlier rulemaking. Industry Petitioners fail to explain, by reference to the actual mechanics of installation, why that EPA judgment was so plainly wrong as to demonstrate arbitrary, capricious, or unreasoned decisionmaking. In what is effectively a war of competing anecdotes, EPA wins because “we are forbidden from substituting our judgment for that of the agency.” *Ass’n of Am. R.R.s v. Interstate Commerce Comm’n*, 978 F.2d 737, 740 (D.C. Cir. 1992) (formatting modified).

Second, Industry Petitioners take issue with EPA’s “idling” assumption—that is, the proposition that certain less efficient electric generating units would temporarily cease operations once energy supply exceeds demand. Indus. Pet’rs’ Br. 23–24. By way of background, Industry Petitioners raised concerns, during the comment period, that the agency’s model assumed an unrealistic number of imminent unit retirements. In response, EPA promised to “constrain[] the model to prevent . . . retirement projections” before 2020. J.A. 361. The

Integrated Model nevertheless assumed that certain units would be “idled” whenever supply outstrips demand. According to Industry Petitioners, treating those units as idled “amount[s] to the same thing” as deeming them permanently retired from production. Indus. Pet’rs’ Br. 24.

That argument mixes apples and oranges. Idling is a natural component of modeling programs, like the Integrated Model, that are designed to reflect electricity markets “as accurately as possible.” 81 Fed. Reg. at 74,528. To capture actual market mechanics, the model determines the least-cost method of anticipating electricity demand over a given period, and it assumes that less efficient units will be “idled” in the short run when they are not needed to meet demand. That temporary, on-again-off-again idling is quite distinct from permanent retirement and closure of a facility. That a model overestimates the rate of long-run retirements thus says nothing about whether it accurately projects the ebb and flow of short-run supply and demand. So EPA’s decision to limit near-term retirement projections based on long-run unprofitability says nothing about the use of temporary, market-driven idling in its economic models.

Industry Petitioners supplement with an argument that EPA failed to fully explain its idling assumption on the record. Indus. Reply Br. 12. But that is neither here nor there, because Industry Petitioners make no showing that the idling assumption actually altered State emissions budgets. EPA used the Integrated Model only to determine the delta between a State’s baseline case and the control case, which it then applied to the State’s historical 2015 emission rates. Because any projected idling was held constant between the baseline case and the control case, it could not affect how much units were expected to reduce their emissions relative to their historical baseline. *Cf.* 81 Fed. Reg. at 74,547.

Third, Industry Petitioners claim the agency promised to treat .1 lbs/mmBtu as a ceiling on the emissions-reduction potential for units equipped with selective catalytic reduction. But instead the agency sometimes assumed rates as low as .075 lb/mmBtu in its actual emission-budget analysis. Indus. Pet'rs' Br. 24–25. That argument does not stand up to scrutiny.

EPA initially proposed calculations based on the assumption that selective catalytic reduction-equipped units could achieve a NO_x emissions level of .075 lbs/mmBtu. See 81 Fed. Reg. at 74,544. In the Final Rule, EPA required a *less-demanding* threshold for Industry of .1 lbs/mmBtu. *Id.* at 74,543. At the same time, EPA had learned during the comment period that certain, newer plants had a proven track record of achieving superior emissions rates. So EPA decided in the Final Rule that those units would be assigned their historical rate if lower than .1 lbs/mmBtu. That decision not to license plants with better emission controls to emit more NO_x than they already do was eminently reasonable.

In a related argument, Industry Petitioners complain that EPA applied its .075 lbs/mmBtu limit for selective catalytic reduction-controlled units that share “common stacks” with uncontrolled units. Indus. Pet'rs' Br. 24. But these common stack arrangements prevent the agency from gathering “reliable data to determine the emission rates of the individual units.” J.A. 461. EPA therefore adopted a .075 lbs/mmBtu estimate in both the base and control cases, effectively concluding that those units equipped with selective catalytic reductions were incapable of “achiev[ing] any additional reductions.” J.A. 461–62.

Because that emissions-reduction capacity was held constant between the base and control measures, Industry

Petitioners have failed to show how the statutory or regulatory scheme required EPA to take a different approach to dealing with the lack of empirical data from combined stacks. Nor did they show how the underlying emissions rate could have affected the delta EPA relied on in calculating a State's emissions-reduction potential, given that the reduction was held constant. EPA's Br. 87–88; *cf.* 81 Fed. Reg. at 74,547.

IV

A

Industry Petitioners challenge the emissions budgets for Mississippi, Oklahoma, Indiana, and Illinois, as well as several specific emissions-allowance allocations to units in those States. The gist of the argument is that the complaining States want larger emissions budgets, and the complaining units want a larger share of those budgets in the form of increased allowances. But a majority of these challenges arise in direct response to EPA's decision in the Final Rule to use the relative-rate method in calculating emissions limits. And because that methodological change was introduced for the first time in the Final Rule and the decision to adopt it was made in response to comments, 81 Fed. Reg. at 74,547–48; J.A. 419, Industry Petitioners' challenges to the relative-rate method are not yet ripe for judicial review. *See* 42 U.S.C. § 7607(d)(7)(B).

The Clean Air Act requires, as a predicate for judicial review, that EPA first be afforded the opportunity to address objections to its rules, and that those objections be raised with "reasonable specificity during the period for public comment." 42 U.S.C. § 7607(d)(7)(B). Where "it was 'impracticable to raise a particular objection' or if 'the grounds for the objection arose after that [comment] period,'" the party challenging the agency action "still must petition EPA for administrative

reconsideration before raising the issue before this Court.” *EME Homer III*, 795 F.3d at 137 (quoting 42 U.S.C. § 7607(d)(7)(B)). Should EPA choose not to grant reconsideration, that decision is independently reviewable. *Id.*; 42 U.S.C. § 7607(d)(7)(B).

So no matter how EPA responds, a petition for reconsideration is “what the statute requires and what [this court] therefore must insist upon,” even if it might “seem a roundabout” way of doing things. *EME Homer III*, 795 F.3d at 137. After all, we cannot fairly review how the agency responded to an argument that was never presented to it. See *Smith v. Berryhill*, 139 S. Ct. 1765, 1779 (2019) (“Fundamental principles of administrative law . . . teach that a federal court generally goes astray if it decides a question that has been delegated to an agency if that agency has not first had a chance to address the question.”); see also *Util. Air Regulatory Grp. v. EPA*, 744 F.3d 741, 747 (D.C. Cir. 2014) (“[T]he only objections that may immediately be raised upon judicial review are those that were raised during the public comment period. Objections raised for the first time in a petition for reconsideration must await EPA’s action on that petition.”). That administrative exhaustion requirement is “strictly” enforced. *Nat. Res. Def. Council v. EPA*, 571 F.3d 1245, 1259 (D.C. Cir. 2009) (per curiam).

Industry Petitioners run headlong into this exhaustion requirement when they complain that Oklahoma’s and Mississippi’s emissions in the agency’s 2017 base cases far exceeded those States’ actual 2015 emissions. Those inflated bases, they say, translated into unrealistically low emissions budgets for both States. Indus. Pet’rs’ Br. 36, 39–40. EPA responds that its methodology neutralizes any errors that might have caused those distortions by holding constant, between the base and control cases, those erroneous inputs that caused the

purported inflation in the base. EPA's Br. 89, 96–97. Industry Petitioners beg to differ, asserting that the artificial inflation is not, in fact, neutralized or cancelled out because: (i) if the base and control cases are multiplied, then the delta between the two will increase; and (ii) the marginal cost of emissions reduction goes up as overall emissions go down, *see* Indus. Reply Br. 17–18.

The questions of whether, and the extent to which, the relative-rate method actually neutralizes distortions are not properly before us. Because the challenged methodology first appeared in the Final Rule, Industry Petitioners' arguments should have been raised in a petition for agency reconsideration. Just like *EME Homer III*, this court is “without authority” to decide a challenge that petitioners “did not and could not have raised . . . during the period for public comment.” 795 F.3d at 137. Instead, agency reconsideration is “the *only* appropriate path” forward. *Id.* (emphasis added). Presumably that exhaustion requirement is why at least two of the Industry Petitioners have already sought agency reconsideration.⁵ Until EPA acts on those reconsideration petitions, the challenges are not yet ripe for our review. *Id.*; *cf.*

⁵ *See* Oklahoma Gas and Electric Company, Petition for Reconsideration, EPA–HQ–OAR–2015–0500–0589, at 5 (“Because the 2017 budget-setting base case was unrealistically high, the ‘delta’ between that number and the 2017 cost threshold was also too high.”), <https://www.regulations.gov/document?D=EPA-HQ-OAR-2015-0500-0589>; *id.* (explaining that “[i]t was *impossible* . . . to comment on EPA’s revised emissions budget calculation methodology” because it “was first presented . . . in the Final Rule”) (emphasis added); Western Farmers Electric Cooperative, Petition for Reconsideration, EPA–HQ–OAR–2015–0500–0588, at 4 (describing the relevant disparity as the “*Perverse IPM Result*”) (emphasis in original), <https://www.regulations.gov/document?D=EPA-HQ-OAR-2015-0500-0588>.

Appalachian Power Co. v. EPA, 135 F.3d 791, 818 (D.C. Cir. 1998) (per curiam) (“The purpose of the exhaustion requirement is to ensure that the agency is given the first opportunity to bring its expertise to bear on the resolution of a challenge to a rule.”). And those Petitioners who have not yet moved for reconsideration run into that same bar on judicial review. *EME Homer III*, 795 F.3d at 138.

The arguments by Energy Association and Indiana Utility Group (“Indiana Petitioners”) meet the same fate. They complain that (i) the relative-reduction method yielded a budget far below the one proposed under EPA’s initial formula; and (ii) EPA’s reliance on 2015 heat-input data, rather than the 2014 data cited in the proposed rule, harmed Indiana units because the State’s heat input fell considerably between the two years. Indus. Pet’rs’ Br. 31.

Petitioners, of course, enjoy no special entitlement to either the initial emissions figure or the less-current data referenced in the proposed rule. And to the extent that the Indiana Petitioners mean to challenge the reasonableness of the relative-rate method or the representativeness of the 2015 data, those empirically laden propositions must first be exhausted in a motion for reconsideration. *Cf. Weinberger v. Salfi*, 422 U.S. 749, 765 (1975) (“Exhaustion is generally required as a matter of preventing premature interference with agency processes, so that the agency may function efficiently and so that it may have an opportunity to correct its own errors, to afford the parties and the courts the benefit of its experience and expertise, and to compile a record which is adequate for judicial review.”).⁶

⁶ Indiana Petitioners recognize this implicitly when, in a single sentence in their reply brief, they suggest that EPA was required to resubmit its relative-reduction methodology for additional comment.

The Indiana Petitioners' remaining contentions do not advance the ball. They criticize EPA's decision to assign emissions rates between .07 and .075 lb/mmBtu to units newly equipped with selective catalytic reduction, even though those technologies had not yet been put into operation in 2015 and 2016. Indus. Pet'rs' Br. 32 & n.30. But EPA reasonably assumed that these technologies would be in use when the Rule took effect in 2017, and so EPA assigned these units an emission rate of .075 lbs/mmBtu to "reflect" the full effects of the new technology. J.A. 420. As for the .07 lbs/mmBtu rate, the figure was used not to adjust the State's 2015 emissions data, but rather to calculate its relative-rate delta. EPA claims that, because it was assigned in both the base and control cases, the method neutralized any inflating effect. EPA's Br. 94 n.24. If Petitioners have any colorable quibble, it is with the proposition that the relative reduction methodology neutralizes the effects of mistaken inputs. And as we have said, that argument must first be raised in a motion for reconsideration.

B

Industry Petitioners from Oklahoma and Illinois challenge other aspects of EPA's budget and unit allocation decisions. Their arguments are no more successful.

As previously explained, EPA computed unit allocations based on a plant's projected share of its State's overall ozone-season heat input, capped at the unit's actual emissions between 2011 and 2015. 81 Fed. Reg. at 74,562. In setting that

But Petitioners have forfeited this cursory reframing of the argument by failing to raise it until their reply brief. *See World Wide Minerals, Ltd. v. Republic of Kazakhstan*, 296 F.3d 1154, 1160 (D.C. Cir. 2002).

cap, EPA relied principally upon measured data reported directly by industry to the agency under 40 C.F.R. Part 75, Subpart G. “Where EPA data [were] unavailable,” the agency said it would also rely on data from the United States Energy Information Administration. J.A. 260.

Western Farmers Electric Cooperative, one of the Oklahoma Industry Petitioners, complains that, for certain units, EPA relied on just one year of available reported data, and refused to fill in the gaps with data from the Energy Information Administration. Indus. Pet’rs’ Br. 40–42. This, they claim, was contrary to the purpose of EPA’s multi-year averaging approach, which was designed to avoid aberrations and to best approximate each unit’s true heat input. Indus. Reply Br. 21.

The Cooperative is mistaken. EPA reasonably prioritized its own data, which “relies on unmodified historic data reported directly by the vast majority of covered sources, whose designated representatives have already attested to [its] validity.” 76 Fed. Reg. at 48,288. In deciding whether to use the Energy Information Administration’s estimates to fill in the gaps, EPA faced a tradeoff between accuracy, on the one hand, and long-run representativeness, on the other. We see no reason to disturb the balance that EPA struck. *Cf. Catawba County*, 571 F.3d at 41 (describing the “extreme degree of deference [given] to [EPA] when it is evaluating scientific data within its technical expertise”) (formatting modified).

In an effort to evade that deference, the Cooperative frames its challenge as the agency “[d]eparting” from its own internal standards. Indus. Pet’rs’ Br. 40–41. But absent evidence that the agency ever committed to or even applied the Cooperative’s preferred approach, the deviation claim falls flat.

Last, Prairie State Generating Company (“Prairie State”), an Illinois-based petitioner, claims it was unfairly disadvantaged by EPA’s unit classification system. Indus. Pet’rs’ Br. 29–30. That system divided units into two general categories: “existing” and “new.” 81 Fed. Reg. at 74,564–65 (describing also a third category for new units in Indian country, not at issue here). Over ninety percent of each State’s budget went to “existing units”—that is, those units that started operation prior to January 1, 2015, and for which EPA possessed at least one year of measured emissions data. 81 Fed. Reg. at 74,564.

By comparison, “new units” are ones for which EPA lacks even this first year’s worth of data. Because the agency lacked reliable emissions data on these new units, it established a new-unit “set-aside” for each State. EPA calculated it based on (i) a uniform two percent baseline, which “reflect[s] a reasonable upper bound of state-level share of emissions from new units;” and (ii) state-specific additions based on amounts that EPA “projects to be emitted from ‘planned’ units in 2020.” J.A. 257. Should new-unit allowances go unallocated, they are then redistributed to existing units before the relevant compliance deadline. 81 Fed. Reg. at 74,565. Relatedly, EPA shifts to the set-aside all allowances from units that have ceased operations for over five years. *Id.* This five-year-long dormancy requirement was necessary because a sudden loss of allowances might “cause a unit, which would otherwise retire, to continue operations in order to retain ongoing allowance allocations.” *Id.* at 74,566.

Prior rulemaking had defined Prairie State as a “new” unit. But by January 2015, when it was well into “normal operations,” it was reclassified as an “existing unit” under the Update Rule, with allocation based upon its actual heat input. Indus. Pet’rs’ Br. 28–29.

Prairie State's principal complaint is that it would have been able to enjoy the benefits of new-unit set asides if it were classified as a new, rather than an existing, unit. *See Indus. Pet'rs'* Br. 29–31. But a preference for more youthful treatment is not a legal argument. In 2011, during the prior rulemaking, Prairie State was new; five years later, not so much.

Prairie State's various ancillary contentions amount to no more than explanations for why it would have been better off if EPA had deviated from its even-handed approach and treated it as a new unit, despite its several years of operation. To the extent Prairie State is attacking, indirectly, the Rule's definition of "new units" or its allocation for retiring units, both of those agency choices were reasonable and sufficiently explained. 81 Fed. Reg. at 74,565. Because "new units" were defined as those for which EPA lacks a single year's worth of reliable emissions data, EPA necessarily could not rely on actual emissions data to make an allocation. J.A. 256. And a set aside for retiring units was necessary to ensure that the allowance allocations did not have the perverse incentive of deterring retirement. 81 Fed. Reg. at 74,566.⁷

⁷ Prairie State's challenge to EPA's budget-setting decision is equally fruitless. According to Prairie State, EPA deflated Illinois' budget allocation by averaging Prairie State's highest heat inputs between 2011 and 2015, which were "artificially low due to issues with [Prairie State's] advanced technology." *Indus. Pet'rs'* Br. 29. But Prairie State's first premise is wrong. EPA relied only on the State's most recent measured data from 2015, not the three-year average, in setting State budgets. 81 Fed. Reg. at 74,547. And by Prairie State's own admission, it "began normal operations in 2014." *Indus. Pet'rs'* Br. 28. There was neither error nor discernible prejudice to Prairie State in that budget-setting decision.

To make that long story short, all of the Industry Petitioners' State- and unit-specific arguments fail.

V

State Petitioners offer up a pair of procedural challenges to the Rule. But both claims suffer fatal jurisdictional defects.

First, Texas, Ohio, and Wisconsin claim that EPA sat on their timely SIP submissions beyond the twelve-month statutory deadline, *see* 42 U.S.C. § 7410(k)(2), so that it could develop the data and methodology necessary to justify rejecting the SIPs and to impose FIPs in their place. State Pet'rs' Br. 29–38; *see* 81 Fed. Reg. 53,309 (Aug. 12, 2016) (disapproval of Wisconsin SIP); 81 Fed. Reg. 53,284 (Aug. 12, 2016) (disapproval of Texas SIP); 81 Fed. Reg. 38,957 (June 15, 2016) (disapproval of Ohio SIP). They ask that we vacate the Rule and instruct the agency to revisit these SIPs based exclusively upon data acquired before the Section 7410(k) deadline. State Pet'rs' Br. 37–38.

Those arguments are, in effect, collateral attacks on EPA's SIP denials—and they come too late in the game. The SIP denials were finalized in June and August of 2016. The States filed their petitions for review in this case in November and December of 2016, far outside of the sixty-day jurisdictional window for challenging SIP denials. *See* 42 U.S.C. § 7607(b)(1); *Dalton Trucking, Inc. v. EPA*, 808 F.3d 875, 879–80 (D.C. Cir. 2015) (sixty-day window is jurisdictional). To the extent the States challenge these SIP denials, their untimely arguments lie beyond our jurisdiction.

The States insist “[i]t is the FIP that is defective, and the FIP that is attacked here.” States' Reply Br. 14. Even if accurate, that would be entirely beside the point. In *EME*

Homer II, the States claimed that EPA, as a condition for promulgating Good Neighbor FIPs, had to give them a second bite at compliant SIPs once the agency had calculated their significant contributions to downwind nonattainment. 572 U.S. at 506–07. The Supreme Court explained that this was not a collateral attack because “[t]he gravamen of the . . . challenge” was that EPA failed to timely comply with a condition precedent for promulgating FIPs, “not that [its] disapproval of any particular SIP was erroneous.” *Id.* at 507. As evidence, the Court emphasized that the States’ argument “*does not depend on the validity of the prior SIP disapprovals*. Even assuming the legitimacy of those disapprovals, the question remains whether EPA was required to do more . . . to trigger the Agency’s statutory authority to issue a FIP.” *Id.* (emphasis added).

By contrast, here, even if the States’ argument were to lead to the invalidation of the Update Rule, its success would “depend on the [in]validity of the prior SIP disapprovals,” and their argument expressly “assum[es]” the illegitimacy of EPA’s decisions. *Id.* at 507. That is the hallmark of an improper collateral attack. The true gravamen of the claim lies in the agency’s failure to timely act upon the States’ SIP submissions and, relatedly, its reliance on data compiled after the SIP action deadline. Both go directly to the legitimacy of the SIP denials. And, critically, those problems exist whether or not EPA follows up with a FIP of its own.

Lastly, we cannot decide Wyoming’s claim that EPA “misled western States into believing that [it] would not apply the [the relevant] modeling to the West,” State Pet’rs’ Br. 42, and yet “applied the CSAPR modeling directly to the West without performing a regional or state-specific analysis and disapproved parts of [Wyoming’s] SIP revision,” *id.* at 43.

Wyoming lacks standing to press that argument here because its injury is traceable not to the Update Rule, but rather to separate rulemakings in which EPA “solicit[ed] public comment” on the appropriateness of applying the CSAPR modeling to Wyoming, 81 Fed. Reg. 81,712, 81,716 (Nov. 18, 2016), and disapproved Wyoming’s SIP, 82 Fed. Reg. 9,142 (Feb. 3, 2017). Because the Update Rule has not caused the complained-of injury, Wyoming cannot demonstrate a key element of standing, *see Friends of the Earth, Inc. v. Laidlaw Environmental Servs. (TOC), Inc.*, 528 U.S. 167, 180–81 (2000), and we are without authority to consider its argument.

VI

Finally, in light of our invalidation of the Update Rule in one respect, we take up the question of the proper remedy. As a general rule, we do not vacate regulations when doing so would risk significant harm to the public health or the environment. *See Allied-Signal, Inc. v. Nuclear Regulatory Comm’n*, 988 F.2d 146, 150–51 (D.C. Cir. 1993). For that reason, we have remanded without vacatur in previous Good Neighbor Provision cases. *See EME Homer III*, 795 F.3d at 138; *North Carolina v. EPA*, 550 F.3d 1176, 1178 (D.C. Cir. 2008) (per curiam). And we have done the same in other cases involving the Clean Air Act. *See, e.g., Env’tl. Def. Fund, Inc. v. EPA*, 898 F.2d 183, 190 (D.C. Cir. 1990) (remanding without vacatur because vacatur would undermine “the enhanced protection of the environmental values covered by the [Clean Air Act]”).

We follow the same course here. Vacatur of the Update Rule “could cause substantial disruption to the [allowance] trading markets that have developed.” *EME Homer III*, 795 F.3d at 132. And “some good neighbor obligations [imposed by the Rule] may be appropriate for some of the relevant

upwind States.” *Id.* Thus, we conclude that vacatur is inappropriate.

We decline Environmental Petitioners’ request, however, to impose a six-month timeframe on EPA’s promulgation of a revised rule. But of course, “we do not intend to grant an indefinite stay of the effectiveness of this court’s decision.” *North Carolina*, 550 F.3d at 1178. And Environmental Petitioners could attempt to “bring a mandamus petition to this court in the event that EPA fails to modify [the Rule] in a manner consistent with our . . . opinion.” *Id.*

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For the foregoing reasons, the petitions for review are granted in part and denied in part.

So ordered.