PRECEDENTIAL

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

_____

No. 22-3026

_____

KEYSTONE-CONEMAUGH PROJECTS LLC,
Petitioner

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY; ADMINISTRATOR ENVIRONMENTAL PROTECTION AGENCY

_____

On Petition for Review of Actions of the United States Environmental Protection Agency

_____

Argued: November 6, 2023

Before: RESTREPO, BIBAS, and SCIRICA, *Circuit Judges*.

(Filed: May 2, 2024)

Gina F. Buchman
Babst Calland
505 9th Street NW
Suite 602

Washington, DC 20004

Joseph V. Schaeffer [ARGUED]
Michael Winek
Babst Calland
603 Stanwix Street
Two Gateway Center, 6th Floor
Pittsburgh, PA 15222

Counsel for Petitioner

Robert A. Reiley
Pennsylvania Department of Environmental Protection
Office of Chief Counsel
9th Floor
400 Market Street
Rachel Carson State Office Building
Harrisburg, PA 17101

Jesse C. Walker [ARGUED]
Office of Attorney General of Pennsylvania
Bureau of Regulatory Counsel
RCSOB 9th Floor
P.O. Box 8464
Department of Environmental Protection
Harrisburg, PA 17105

Counsel for Intervenor Pennsylvania Department of Environmental Protection

Brandon N. Adkins [ARGUED]
United States Department of Justice
Environment & Natural Resources Division

P.O. Box 7611
Ben Franklin Station
Washington, DC 20044

Counsel for Respondents

Zachary M. Fabish
Sierra Club Environmental Law Program
50 F Street NW
8th Floor
Washington, DC 20001

Charles McPhedran [ARGUED]
Earthjustice
1617 John F. Kennedy Boulevard
Suite 2020
Philadelphia, PA 19103

Mychal Ozaeta
Earthjustice
707 Wilshire Boulevard
Suite 4300
Los Angeles, CA 90017

Counsel for Intervenor Respondent Sierra Club

Stephen D. Daly
Katherine L. Vaccaro
Manko Gold Katcher & Fox
Three Bala Plaza East
Suite 700
Bala Cynwyd, PA 19004

Counsel for Intervenor Respondent Montour LLC

Michael F. Strande
Office of Attorney General of Maryland
1800 Washington Boulevard
Suite 6048
Baltimore, MD 21230

Counsel for Amicus Appellee State of Maryland

Christian D. Wright
Office of Attorney General of Delaware
820 N French Street
Carvel Office Building
Wilmington, DE 19801

Counsel for Amicus Appellee State of Delaware

Claiborne E. Walthall
Office of Attorney General of New York
Environmental Protection Bureau
The Capitol
Albany, NY 12224

Counsel for Amicus Appellee State of New York

OPINION OF THE COURT

SCIRICA, *Circuit Judge*

The Commonwealth of Pennsylvania submitted a plan to regulate emissions to the EPA for its approval, as the Clean Air Act requires. At first, the EPA approved of the plan. But then, in August 2020, this Court vacated that approval and directed the Agency to either approve a new state-made plan or "formulate a new federal . . . plan" to implement emissions standards in the Commonwealth within two years. *Sierra Club v. EPA*, 972 F.3d 290, 309 (3d Cir. 2020). The EPA ultimately decided to make its own plan and promulgated it towards the end of 2022. Now the Commonwealth joins one of the three coal power companies affected by the plan to seek our review. They argue first that the EPA exceeded its statutory authority when it promulgated the plan and second that the plan is arbitrary and capricious because the EPA failed to show its work. But since the EPA acted in accordance with the Clean Air Act, we will deny the petition for review.

I.

A. The Clean Air Act

This dispute is governed by the Clean Air Act, which gives Courts of Appeals jurisdiction to review the EPA's promulgation of an implementation plan. *See* 42 U.S.C. § 7607(b)(1). The Act, which has been described as a model of "cooperative federalism," *EPA v. EME Homer City Generation, L.P.*, 572 U.S. 489, 537 (2014) (Scalia, J., dissenting), tasks federal, state, and local authorities with combatting the challenging problem of interstate air pollution. *See* 42 U.S.C. § 7401(a)–(c) (noting that a "primary goal" of the Clean Air Act "is to encourage or otherwise promote

reasonable Federal, State, and local governmental actions . . . for pollution prevention"); *see also Bell v. Cheswick Generating Station*, 734 F.3d 188, 190 (3d Cir. 2013) ("The Clean Air Act states that air pollution prevention and control is the primary responsibility of individual states and local governments but that federal financial assistance and leadership is essential to accomplish these goals.").

To that end, the Clean Air Act requires the EPA to promulgate and revise National Ambient Air Quality Standards ("NAAQs") for certain pollutants, including ozone, to protect public health, with higher requirements for areas that do not attain those standards. 42 U.S.C. § 7409(a)–(b), (d)(1). Once the EPA establishes the relevant standards, states have the initial responsibility to devise state implementation plans ("SIPs") to address the EPA's air pollutant reduction goals. *See Sierra Club*, 972 F.3d at 293–94; *see also* 42 U.S.C. §§ 7410, 7502.

A SIP must satisfy Reasonably Available Control Technology ("RACT") requirements. *See* 42 U.S.C. § 7502(c)(1). RACT is a "technology-forcing standard designed to induce improvements and reductions in pollution for existing sources." *Sierra Club*, 972 F.3d at 294. Although undefined in the Clean Air Act, the EPA has repeatedly interpreted this term to mean "the lowest emission limit that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility." 87 Fed. Reg. 53381, 53382 (Aug. 31, 2022) (internal quotation marks omitted); *see also Sierra Club*, 972 F.3d at 294, 300 (explaining that RACT is not "the best possible emissions limit," but "the best limit that is also economically and technically achievable for plant

operators").

To be RACT-compliant, an implementation plan must satisfy technological and economic feasibility. *Sierra Club*, 972 F.3d at 295. Technological feasibility concerns the application of an emission reduction method to a particular source and "consider[s] the source's process and operating procedures, raw materials, physical plant layout, and any other environmental impacts such as water pollution, waste disposal, and energy requirements." *Id.* (internal quotation marks omitted). Economic feasibility "is largely determined by evidence that other sources in a source category have in fact applied the control technology in question" and "rests very little on the ability of a particular source to 'afford' to reduce emissions to the level of similar sources." *Id.* (internal quotation marks omitted).

Once a state submits a SIP or SIP revision, the EPA must review it for completeness and compliance with the Clean Air Act's requirements. *See* 42 U.S.C. §§ 4710(k)(1)(B), 7410(k)(2)–(4). Specifically, within twelve months of determining that a submission is complete, the EPA must approve, disapprove, or conditionally approve, in whole or in part, each SIP or SIP revision. *Id.* § 7410(k)(2)–(4). If the EPA determines that a state failed to make a complete required submission or "disapproves a [SIP] submission in whole or in part," the EPA "shall promulgate a Federal implementation plan at any time within [two] years" of such determination "unless the State corrects the deficiency, and the [EPA] approves the plan or plan revision, before the [EPA] promulgates" a Federal implementation plan ("FIP"). *Id.* § 7410(c)(1).

B. Factual Background and Procedural History

In May 2016, the Pennsylvania Department of Environmental Protection ("PADEP") submitted a SIP ("the 2016 SIP") to the EPA to satisfy certain pollution control requirements for the 2008 revision to the 1997 ozone NAAQs. *Sierra Club*, 972 F.3d at 296. PADEP's plan proposed nitrogen oxide ("NOx") emission limits for the coal-fired electric generating units ("EGUs") equipped with selective catalytic reduction ("SCR") controls operating in Pennsylvania. *See id.* at 293, 296. SCR is the "preferred method for limiting coal-fired power plant pollution" and involves "injecting a substance such as ammonia or urea as a catalyst into the post-combustion flue gas" to break down NOx, an ozone precursor emission, "into its component nitrogen and water molecules and to be dispersed as vapor." *Sierra Club*, 972 F.3d at 295–96. In March 2018, the EPA provisionally approved the 2016 SIP, which was opposed by a number of groups, including the Sierra Club and neighboring states. *Id.* at 296–97. In 2019, the EPA formally approved the 2016 SIP, and Sierra Club petitioned this Court for review. *Id.* at 297.

On August 27, 2020, this Court vacated the EPA's approval of the 2016 SIP provisions that Sierra Club challenged, and remanded the matter to the Agency "with instructions that it develop enforceable pollution controls in accordance with its legal obligations." *Id.* at 293. EPA was given two years to "approve a revised, compliant SIP" or "formulate a new federal implementation plan." *Id.* at 309.

Following our decision in *Sierra Club*, PADEP and the EPA worked together for months on a corrective SIP revision.

EPA Br. 9. In September 2021, the EPA proposed to disapprove the invalidated portions of the 2016 SIP "to ensure that [it] ha[d] authority to promulgate a FIP if Pennsylvania d[id] not submit a timely or approvable SIP revision addressing the Third Circuit's decision." 86 Fed. Reg. 51315, 51316 (Sept. 15, 2021). Between September and December 2021, PADEP published draft permits that contained its proposed RACT determinations and engaged in the comments process for its proposals. 87 Fed. Reg. 31798, 31801–02 (May 25, 2022). The EPA expressed concern about the draft permits, which the Agency believed were inconsistent with our decision in *Sierra Club*. *See, e.g.*, JA 525–27.

In February 2022, the EPA informed PADEP that rather than continue working with the Commonwealth on a corrective SIP, it would issue a FIP that it had been concurrently working on. JA 760. In May 2022, the EPA published a proposed FIP. *See* 87 Fed. Reg. 31798 (May 25, 2022). In May and June 2022, PADEP submitted case-by-case RACT SIP revisions ("the 2022 SIP"). 87 Fed. Reg. 53381, 53382 (Aug. 31, 2022). The same month, the EPA held a public hearing on its proposed FIP, and, in July 2022, the comment period for the proposed FIP closed. 87 Fed. Reg. 31798 (May 25, 2022). PADEP and the affected facilities submitted comments, which included concerns that the EPA's move to promulgate a FIP "usurp[ed] Pennsylvania's regulatory primacy" and "violated the cooperative-federalism structure underpinning the [Clean Air Act]." Keystone-Conemaugh Br. 19. Moreover, the commentators expressed concern about the assumptions, methodology, and conclusions the EPA made in its calculation of RACT. *Id.* at 19–20.

In August 2022, the EPA finalized the partial

disapproval of the 2016 SIP, and then issued the FIP. *See* 87 Fed. Reg. 50257 (Aug. 16, 2022); 87 Fed. Reg. 53381 (Aug. 31, 2022); *see also* Notice of Compliance, *Sierra Club v. EPA*, No. 19-2562 (3d Cir. Aug. 26, 2022).

In October 2022, Petitioner Keystone-Conemaugh Projects LLC ("Keystone-Conemaugh"), the operator of the Keystone and Conemaugh Generating Stations, and Homer City Generation LP ("Homer City"), the operator of the Homer City Generating Station, filed petitions for review, which this Court consolidated.[1] Docket No. 22-3026, Doc. Nos. 1-1, 8; Docket No. 22-3039, Doc. No. 1-1. In December 2022, PADEP intervened in support of Petitioners, and Sierra Club and Montour, LLC, the operator of the Montour Generating Station, intervened on behalf of Respondent, the EPA. Docket No. 22-3026, Doc. Nos. 23, 24.

On February 15, 2024, after briefing and argument in the above-captioned matter, the EPA issued a notice of proposed rulemaking to disapprove the 2022 SIP. Docket. No. 22-3026, Doc. No. 92.

---

[1] This case was consolidated for purposes of scheduling and joint appendix with Appeal No. 22-3039, *Homer City Generation LP. v. EPA*, wherein Homer City filed a petition for review challenging the FIP. However, in accordance with the agreement of the Parties, that appeal was dismissed under Fed. R. App. P. 42(b), with prejudice and without cost to either party. Because Keystone-Conemaugh and PADEP adopted arguments advanced by Homer City, Homer City's Opening Brief and Reply Brief were filed in this appeal as well.

C. The FIP

The FIP establishes NOx emission limits for SCR-equipped coal-fired EGUs in Pennsylvania to address the Clean Air Act's RACT requirements for the 1997 and 2008 ozone NAAQs. *See* 87 Fed. Reg. 53381, 53402–05 (Aug. 31, 2022). There are nine remaining EGUs in Pennsylvania operating at four facilities: three at Homer City Generating Station, two each at Keystone and Conemaugh Generating Stations, and two at Montour Generating Station. *Id.* at 53381. In formulating the FIP, the EPA determined that SCR systems "represent[ed] appropriate RACT level control technology" because all the subject facilities are equipped with SCR systems, which are "demonstrated and highly efficient control technolog[ies] for the removal of NOx from emissions associated with coal-fired boilers." JA 482–83.

The FIP establishes two NOx emission limits: a weighted, facility-wide rolling thirty-day average emission rate expressed in pounds per million British Thermal Units ("MMBtu") (a unit of heat), and an EGU-specific daily mass emission limit expressed in pounds. *See* 87 Fed. Reg. 53381, 53384–85, 53401–04 (Aug. 31, 2022). In addition, the FIP establishes recordkeeping and reporting requirements such that each facility must biannually submit reports documenting, *inter alia*, daily operating time, daily NOx mass emissions, heat input, and facility-wide thirty-day rolling emission rates. *Id.* at 53404.

In its proposed FIP, the EPA explained that it was difficult to formulate an enforceable RACT limit because each EGU's operations varied in a way that affected SCR performance. *See* EPA Br. 12–13; JA 482–84; 87 Fed. Reg.

31798, 31803–04 (May 25, 2022). The EPA attributed this variation in EGU performance to the units' shift from "baseload" to "cycling" operation. 87 Fed. Reg. 53381, 53382–83 (Aug. 31, 2022). When the EGUs were built some sixty years ago, they were intended to operate as baseload units, running at near-full capacity almost constantly with high heat inputs and flue-gas temperatures. 87 Fed. Reg. 31798, 31804 (May 25, 2022). The SCR controls installed on the Keystone, Homer City, and Montour EGUs in the early 2000s and on the Conemaugh EGUs in 2014 were designed to operate under these conditions and permitted the units to achieve very low NOx emissions when they operated at baseload.[2] *Id.*; JA 484–85. The EPA found that for the past decade, instead of operating at baseload, the EGUs tended to "cycle" between high heat inputs when demand for electricity is high and low heat or full shutdowns when demand is low. JA 486–88. This cycling behavior affected the units' ability to operate their SCR controls. *Id.* Indeed, the Agency observed that the EGUs frequently cycled down to heat inputs below the threshold at which they could run their SCR controls, leading to excess emissions. *Id.* Accordingly, the EPA sought to develop RACT

[2] The EPA observed that regulatory pressure also influenced the units' emission levels. During its review of historical operating data, the EPA found that "[s]ome of the lowest NOx emissions [it] observed coincided with high NOx allowance prices associated with the NOx SIP Call which went into effect in 2003." 87 Fed. Reg. 53381, 53390 (May 25, 2022). The EPA found that its observation of historical data and corresponding regulations supported its view that the units had no trouble meeting lower emission limits when it was economically advantageous to do so. *Id.*

limits that addressed this cycling behavior and its effect on SCR performance but also accounted for the lower emissions rates the EGUs were able to achieve with their SCR controls when operating at baseload. 87 Fed. Reg. 53381, 53383 (Aug. 31, 2022); 87 Fed. Reg. 31798, 31805–07 (May 25, 2022).

The EPA developed a weighted rates methodology that considered each EGU's historical baseload operation data and more recent cycling operation data. JA 490–491. The EPA analyzed data from each EGU's ozone seasons and ranked each unit's ozone season performance based on its overall NOx emission rate. An ozone season is the period from May 1 to September 30 when meteorologic conditions are most conducive to ozone formation. *Sierra Club*, 972 F.3d at 293–94, 300. The EPA explained that it used ozone-season data as opposed to full-year data for a number of reasons. First, the EPA found that from 2017 onwards, the data showed that SCR systems were often not operated out of ozone season. 87 Fed. Reg. 53381, 53392 (Aug. 31, 2022). Second, the EPA explained that the prevailing regulatory scheme[3] permitted the

[3] The EPA explained the effect of other regulatory requirements on non-ozone season data. 87 Fed. Reg. 53381, 53392 (Aug. 31, 2022). The Agency acknowledged that during this period, the facilities were subject to the Clean Air Interstate Rule's ("CAIR") annual NOx requirement beginning in 2009, and the Cross-State Air Pollution Rule's ("CSAPR") annual NOx requirements beginning in 2015. *Id.* CAIR set an annual NOx emission rate of 0.15 lb/MMBtu, and CSPAR, which replaced CAIR, utilized a cost-effectiveness level. *Id.* These were cap and trade programs, however, and they permitted individual sources to exceed their allocated allowances by a certain percentage by purchasing additional

facilities to operate their EGUs without having to meet a specific NOx emission rate, meaning that non-ozone season data did not reflect the SCR systems' true non-ozone season capabilities. *Id.* The EPA's decision to analyze ozone-season data was also consistent with PADEP's sole reliance on ozone-season emissions in developing the 2016 SIP. *Id.*

The EPA sorted the hourly ozone season operating data based on whether the EGU's SCR system was operating to calculate the rates and weights for the formula, which the agency expressed as follows:

> *(SCR-on rate * SCR-on weight) + (SCR-off rate*
>
> ** SCR-off weight) = emissions limit in*
>
> *lb/MMBtu*

JA 493; JA 491–92. The SCR-on and SCR-off rates represent the EGU's performance when its SCR system is or is not running, respectively. JA 493. For each unit at the Keystone, Homer City, and Montour facilities, the SCR-on rate is the average hourly NOx rate for hours when the unit's SCR system was running during its third-best ozone season (*i.e.,* the third lowest ozone season average) from 2003 to 2021. *Id.* The EPA used this time period because it encompassed all years of SCR

NOx allowances from other sources. *Id.* Based on the foregoing, the EPA concluded that non-ozone season emissions data beginning in 2009 did not necessarily reflect the SCR control systems' true non-ozone season capabilities because the units were not required to meet a specific NOx emission rate. *Id.*

system operation for the three facilities. 87 Fed. Reg. 53381, 53384 (Aug. 31, 2022). The EPA selected the third-best ozone season to account for degradation of the SCR systems over time and to avoid biasing the limit with "uncharacteristically low emitting days, or under uncharacteristically optimal operating conditions."[4] *Id.* Because SCR controls were not installed on Conemaugh's EGUs until 2014, the EPA derived the SCR-on rate for its EGUs from the units' second-best ozone season from 2015 to 2021. *Id.* at 53382; JA 493. The EPA used the second-best ozone season for Conemaugh's EGUs after the units' third-best ozone season yielded higher NOx limits than those for the other facilities.[5] 87 Fed. Reg. 53381, 53393 (Aug. 31, 2022).

For each unit, the SCR-off rate represents the average of all hours the EGU's SCR system was likely not running. JA 493. As with the SCR-on rate, the EPA used the period from 2003 to 2021 for the Keystone, Homer City, and Montour EGUs, and the period from 2015 to 2021 for Conemaugh's EGUs. JA 493; 87 Fed. Reg. 53381, 53384 (Aug. 31, 2022).

---

[4] The EPA also explained that it had used a similar approach in two other recent rulemakings. *See* JA 493.

[5] The EPA attributed the higher NOx limits for Conemaugh resulting from the use of the third-best ozone season data to the more limited data set for the facility's EGUs. *Id.* The EPA observed that Conemaugh's average ozone season NOx rates varied significantly between 2015 and 2021, and that the shorter historical timeframe for the facility did not contain periods "with high NOx allowance prices" that would have encouraged Conemaugh to try to achieve lower emissions. *Id.*; JA 493 n.10.

The EPA then calculated SCR-on and SCR-off "weights," which represent the amount of heat input spent above or below the threshold at which each unit could operate its SCR system. 87 Fed. Reg. 53381, 53384 (Aug. 31, 2022). The EPA formulated the weights by using data from the 2011 to 2021 ozone seasons, which the Agency determined were likely representative of the time period when the EGUs began cycling, and because it was likely reasonable to expect that the EGUs would continue cycling operations in the future. *Id.* Again, because Conemaugh's SCR systems were not installed until 2014, the EPA used data from 2015 to 2021 to calculate its weights. JA 501–02. The EPA calculated the weights for the Keystone, Homer City, and Montour EGUs from the ozone seasons when each unit had its third-highest proportion of heat input spent above the threshold for SCR operations. JA 493. As with the rates, the EPA used Conemaugh's EGUs' second-best ozone season to calculate the applicable weights.[6] 87 Fed. Reg. 53381, 53400 (Aug. 31, 2022).

Applying the formula, the EPA crafted limits using historical data from each EGU that recognized the units' present and future cycling behavior, but also weighted the rates to discourage the EGUs from cycling down to a heat threshold below which their SCR controls could not operate. EPA Br. 16. In response to comments, the EPA's final emission rates

[6] The EPA decided against using the Conemaugh's third-best ozone season to formulate the weights for its EGUs because the third-best weight would be more analogous to the mean rate over the shorter data set. 87 Fed. Reg. 53381, 53400 (Aug. 31, 2022). In contrast, the Agency found that using the second-best ozone season would produce a rate that better reflected the lowest rates the Conemaugh EGUs could achieve. *Id.*

were averaged over thirty days and across EGUs at each facility to "smooth" variability in operations. 87 Fed. Reg. 53381, 53396, 53399 (Aug. 31, 2022).

In addition to the rolling thirty-day limit for each facility, the FIP includes a limit on the pounds of NOx each unit could produce each day. JA 494. The EPA explained that this limit complemented the rolling thirty-day limit to ensure that RACT was applied continuously. *Id.* The EPA derived the daily limit by using the thirty-day rolling average limit for an EGU, multiplying it by the maximum rated heat input for that EGU (MMBtu/hr), and multiplying that figure by twenty-four hours. 87 Fed. Reg. 53381, 53401 (Aug. 31, 2022).

II.

We have jurisdiction to review the FIP as it is a final agency action applicable to the four facilities located within this Circuit. *See* 42 U.S.C. § 7607(b)(1).

We review the contents of a final EPA rule to determine whether it is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with the law." 42 U.S.C. § 7607(d)(9)(A); *see also Sierra Club*, 972 F.3d at 298. Although our review is deferential under this "narrow standard," *GenOn REMA, LLC v. EPA*, 722 F.3d 513, 525 (3d Cir. 2013), "the agency cannot reach whatever conclusion it likes and then defend it with vague allusions to its own expertise," *Sierra Club*, 972 F.3d at 298. Instead, it "must examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'" *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463

U.S. 29, 43 (1983) (citation omitted). When an agency action fails to consider an important aspect of the problem, cites no data to support its conclusion, or fails to articulate a rational basis for its conclusion, such an action is arbitrary and capricious. *See Sierra Club,* 972 F.3d at 298 (collecting cases finding agency action arbitrary and capricious).

"That said, arbitrary and capricious review is not meant to be an exacting standard," *Logic Tech. Dev. LLC v. FDA*, 84 F.4th 537, 549 (3d Cir. 2023), and we must be mindful not to "substitute [our] judgment for that of the agency," *Motor Vehicle Mfrs. Ass'n of U.S.*, 463 U.S. at 43. Accordingly, we must defer to the agency's expertise and "uphold agency action even if its reasoning is 'of less than ideal clarity' as long as 'the agency's path may reasonably be discerned.'" *Logic Tech. Dev. LLC*, 84 F.4th at 549 (quoting *Garland v. Ming Dai*, 593 U.S. 357, 369 (2021)). This is "especially [true] in the context of reviewing a federal agency's scientific determinations." *GenOn REMA*, 722 F.3d at 526 (citing *New Jersey Envt'l Fed'n v. U.S. Nuclear Regul. Comm'n*, 645 F.3d 220, 228 (3d Cir. 2011)).

III.

Petitioners make two arguments that we must address sequentially. First, Petitioners assert that the EPA exceeded its authority under Clean Air Act by promulgating the FIP. Second, Petitioners argue that even if the EPA's promulgation of the FIP were lawful, the Agency's action was nonetheless arbitrary and capricious because its calculations for NOx limits relied on unsupported assumptions and failed to meet RACT standards.

A. Whether EPA was Statutorily Authorized to Promulgate a FIP

The Parties' arguments respecting the EPA's statutory authority under the Clean Air Act to promulgate a FIP turn on the effect of our vacatur of the 2016 SIP in *Sierra Club*.

Petitioners argue that the EPA could not promulgate a FIP without first considering the 2022 SIP. According to Petitioners, our "vacatur wipe[d] the slate clean" and rendered the 2016 SIP a "legal nullity." Arg. Tr. 7:3–5; 7:17. As a result, in Petitioners' view, the EPA's partial disapproval of the 2016 SIP following this Court's vacatur in *Sierra Club* "had no legal effect because the [2016 SIP] did not exist at that time as a matter of law." Keystone-Conemaugh Reply Br. 8; *see also* Keystone-Conemaugh Br. 29. Assuming the 2022 SIP was the only implementation plan before the EPA, Petitioners argue that the Agency was obligated under the Clean Air Act to either approve or disapprove it before promulgating a FIP.

The EPA counters, explaining that its partial disapproval of the 2016 SIP permitted it to promulgate a FIP. Implicit in the EPA's argument is that our vacatur in *Sierra Club* merely revoked the EPA's approval of the 2016 SIP, and that the Agency still needed to render a decision on the first implementation plan. *Sierra Club*, 972 F.3d at 293.

As a threshold matter, a vacated agency action is a nullity that has no force and effect. *Alabama Power Co v. EPA*, 40 F.3d 450, 456 (D.C. Cir. 1994). When a court vacates an agency's rule, it restores the status quo before the invalid rule took effect and the agency must "initiate another rulemaking proceeding if it would seek to confront the problem anew."

Indep. U.S. Tanker Owners Comm. v. Dole, 809 F.2d 847, 854 (D.C. Cir. 1987). In other words, when a court vacates the EPA's approval of a SIP, it restores the status quo to that before the Agency issued a final decision approving or disapproving the SIP. *See Sierra Club v. Johnson*, 374 F. Supp. 2d 30, 33 (D.D.C. 2005).

Accordingly, our decision in *Sierra Club* is properly understood as vacating the EPA's approval of the 2016 SIP, not the SIP itself. *See Sierra Club*, 972 F.3d at 293 ("[W]e hold that the EPA's approval was arbitrary and capricious."). As a result, the EPA needed to make a new final ruling respecting the 2016 SIP. The EPA did so in August 2022 when the Agency finalized the partial disapproval of the provisions of the 2016 SIP at issue in *Sierra Club*. *See* 87 Fed. Reg. 50257 (Aug. 16, 2022). Once the EPA partially disapproved the 2016 SIP, it was statutorily authorized to promulgate a FIP. *See* 42 U.S.C. § 7410(c)(1)(B).

PADEP's submission of the 2022 SIP revisions before the EPA's final, partial disapproval of the 2016 SIP did not divest the EPA of its authority to promulgate a FIP for several reasons. First, PADEP's submission of the 2022 SIP did not absolve the EPA of its responsibility to act on the 2016 SIP. *See Johnson*, 374 F. Supp. 2d at 33 (explaining that the EPA's duty to act on an initial SIP submission whose approval was vacated was "not [] mooted or overtaken by the fact that the states made [additional] submissions"). Second, the plain language of the Clean Air Act does not require the EPA to act on a revised SIP before it can issue a FIP. *See* 42 U.S.C. § 7410(c). The Act provides that the EPA "shall promulgate" a FIP "at any time within [two] years after" the Agency "disapproves a State implementation plan submission in whole

or in part, unless the state corrects the deficiency, and the [EPA] approves the plan or plan revision, before the [EPA] promulgates such [a FIP]." *Id.* Although the Clean Air Act indicates that submission of a revised SIP and approval of a SIP revision by the EPA will vitiate the EPA's obligation to promulgate a FIP, the provision contains no language *requiring* the EPA to act on the SIP revision before promulgating the FIP.[7] *See, e.g.*, *SIH Partners LLLP v. Comm'r*, 923 F.3d 296, 304, n.4 (3d Cir. 2019) ("We do not read absent words into a statute 'so that what is omitted . . . may be included within its scope.'" (quoting *Lamie v. U.S. Trustee*, 540 U.S. 526, 538 (2004))). The EPA thus did not exceed its statutory authority by promulgating a FIP without first addressing the 2022 SIP.[8]

---

[7] Indeed, if the EPA were required to act on each and every SIP revision submitted before it could issue a FIP, an untenable scenario could ensue. For instance, if a state were to submit multiple inadequate SIP revisions, it could effectively nullify the EPA's ability to issue a FIP and thus delay the implementation of any emission limits. *See* Amici Br. 10.

[8] Petitioner PADEP also argues that the EPA violated the Clean Air Act and abused its discretion by promulgating a FIP that exceeded the scope of its partial disapproval of the 2016 SIP. *See* PADEP Reply Br. 5–6; *see also* Arg. Tr. 20:12-21:10. In particular, PADEP contends that the EPA's FIP contained source-specific RACT determinations even though it never disapproved PADEP's source-specific RACT submissions in the 2016 SIP. PADEP Reply Br. 5. PADEP's argument fails for two reasons. First, PADEP waived this argument by first raising it in its reply brief. *See Garza v. Citigroup Inc.*, 881 F.3d 277, 284 (3d Cir. 2018) ("Raising an issue in a reply brief is too late, for '[a]s a general matter, an appellant waives an argument in support of reversal if it is not raised in the opening

Relatedly, Petitioners argue that even if the EPA was statutorily authorized to promulgate a FIP without first considering the 2022 SIP, the Agency's decisions to discontinue its cooperation with PADEP and develop a FIP without "a reasoned explanation for its actions," were arbitrary, capricious, and an abuse of discretion. Keystone-Conemaugh Br. 31; PADEP Br. 20–24. Petitioners explain that the EPA abused its discretion by contravening the principles of "cooperative federalism" that animate the Clean Air Act.

Petitioners' abuse of discretion argument is predicated on the "core principle" of cooperative federalism that permeates the Clean Air Act, which gives states the "primary responsibility" for assuring air quality by submitting SIPs that specify the manner in which air quality standards will be maintained. *See Homer City*, 572 U.S. at 542 (Scalia, J., dissenting) (quoting 42 U.S.C. § 7401(a)(3)); *see also* 42 U.S.C. §§ 7407(a). Petitioners assert that the EPA is "relegated . . . to a secondary role in the process of determining and enforcing [] specific, source-by-source emission

---

brief.'" (quoting *In re Asbestos Prod. Liab. Litig. (No. VI)*, 873 F.3d 232, 237 (3d Cir. 2017))). Second, the plain language of Section 7410(c) makes clear that even partial disapproval of a SIP permits the EPA to authorize a FIP. *See* 42 U.S.C. § 7410(c)(1)(B) (allowing the Administrator to promulgate a FIP at any time within two years after the Administrator "disapproves a State implementation plan submission *in whole or in part*" (emphasis added)). Section 7410(c) contains no qualifying language that the EPA's power to promulgate a FIP is somehow constrained by the extent or scope of its disapproval.

limitations," *Train v. Nat. Res. Def. Council, Inc.*, 421 U.S. 60, 79 (1975), and "only if a SIP fails to meet [the statute's] goals may the Agency commandeer a State's authority by promulgating a FIP," *Homer City*, 572 U.S. at 538 (Scalia, J., dissenting). Consistent with the dissent in *Homer City*, Petitioners urge that the EPA "has discretion to arrange things so as to preserve the Clean Air Act's core principle of state primacy—and that it is an *abuse of discretion* to refuse to do so." *Id.* at 542 (citing 42 U.S.C. § 7607(d)(9)(A)). Indeed, the dissent in *Homer City* viewed Section 7410(c)(1) as affirming this principle of state primacy because the last clause of the section terminates the EPA's authority to promulgate a FIP if the state submits a corrective SIP and EPA approves it. *Id.* at 542.

Petitioners thus argue that the EPA "could have arranged things here to preserve Pennsylvania's primacy over RACT determinations for coal-fired stations," but instead chose to "federalize air emissions regulation in a way that Congress never intended." Keystone-Conemaugh Reply Br. 12–13. In their view, the EPA acted in bad faith by first working with PADEP to promulgate a revised SIP and then reversing course and issuing a FIP. Keystone-Conemaugh Reply Br. 14. Next, Petitioners explain that the EPA abused its discretion by failing to review and address any problems with PADEP's 2022 SIP in the time that the Agency spent promulgating the FIP. Keystone-Conemaugh Reply Br. 14. We disagree.

As a threshold matter, we note that Petitioners focus their cooperative federalism arguments on the 2022 SIP, which was PADEP's *second* attempt at formulating a compliant plan. PADEP had already exercised its primary regulatory

responsibility under the Clean Air Act by formulating the emission limits in the 2016 SIP, the EPA's approval of which we vacated in *Sierra Club*. PADEP had the first shot at developing emission limits, but because its SIP "fail[ed] to meet [the Clean Air Act's] goals," *Homer City*, 572 U.S. at 538 (Scalia, J., dissenting), the EPA had the authority and responsibility to promulgate a FIP at any time within the following two years, *id.* at 508 (majority opinion). Thus, consistent with Petitioners' interpretation of cooperative federalism, the EPA was already exercising its "secondary" authority under the Clean Air Act.[9]

Next, Petitioners' arguments respecting the discretion that the EPA retains under Section 7410(c)(1) after disapproving a SIP are foreclosed by controlling caselaw and the plain language of the statute. First, although the statute puts priority on the states' role, § 7401(a)(3), the majority in *Homer City* dismissed the dissent's view that the EPA adhere to principles of cooperative federalism when acting under Section 7410(c)(1). The majority explained that "nothing in the statute so restricts [the] EPA," which retains "plenary authority to issue a FIP 'at any time' within the two-year period that begins the moment [the] EPA determines a SIP to be inadequate." *Homer City*, 572 U.S. at 511 n.14 (majority opinion); *see also Oklahoma v. EPA*, 723 F.3d 1201, 1223 (10th Cir. 2013) (holding that the filing of a SIP did not relieve the EPA of its duty to promulgate a FIP, nor did the Agency need to delay promulgation of a FIP until it ruled on a proposed SIP). This

[9] As Petitioners readily admit, the EPA "acknowledged state primacy in both word and deed" by initially cooperating with PADEP in developing a revised SIP. Keystone-Conemaugh Reply Br. 13.

is what transpired here.

Although Petitioners may take issue with the EPA's decision to discontinue its cooperation with the Commonwealth on the 2022 SIP, the EPA did not abuse its discretion by doing so. The Agency was under no obligation to cooperate with PADEP, but in doing so, the EPA afforded the Commonwealth *more* deference than required under Section 7410(c)(1).[10] And when the EPA decided to discontinue its cooperation with PADEP and promulgate a FIP, it provided a rationale for its decision: this Court's fast approaching deadline. Faced with substantive concerns about PADEP's proposal and its ability to meet *Sierra Club*'s two-year deadline, *see* 972 F.3d at 309, the EPA reasonably decided to promulgate a FIP to ensure compliance with our Order. *Cf. Midwest Ozone Grp. v. EPA*, 61 F.4th 187, 193 (D.C. Cir. 2023) (crediting the "limited amount of time [the] EPA had to complete the rulemaking" in assessing the reasonableness of

[10] PADEP complains that it expended substantial resources over the course of its year-long cooperative effort with the EPA to develop a revised SIP to meet its Clean Air Act obligations in response to *Sierra Club* only to have its efforts squandered when the EPA decided to discontinue its cooperation with the Commonwealth. PADEP Br. 17–18. But the statutory language anticipates and permits this potential outcome. As previously discussed, after the EPA disapproves an initial SIP submission, it must promulgate a FIP unless the state submits a revised SIP submission, which the Agency may then approve. *See* 42 U.S.C. § 7410(c)(1). Put differently, PADEP was entitled to develop a revised SIP with or without the EPA's encouragement for the Agency's consideration, but there was no guarantee that the EPA would approve any SIP revision.

the EPA's actions).

Although we conclude that the EPA's conduct was reasonable and did not contravene principles of cooperative federalism, we do not necessarily find the Parties' conduct efficient. Nevertheless, we believe the EPA and PADEP should endeavor to communicate more clearly about how they will work together to attain the Commonwealth's required emissions reductions, recognizing that doing so benefits all Pennsylvanians, as well as residents of downwind states.

B. Whether the EPA Acted Arbitrarily, Capriciously, or Abused its Discretion in Promulgating the FIP

Because the EPA's promulgation of the FIP was proper, we proceed to Petitioners' arguments respecting the reasonableness of the FIP's emission limits. Petitioners make numerous arguments, but generally complain that the EPA's emission limits are arbitrary and capricious because: (1) they are predicated on baseless assumptions and on a methodology lacking evidentiary support; (2) they fail to satisfy RACT standards; and (3) they impair the Petitioners' legal obligations to PJM Interconnection ("PJM"), its regional electric transmission organization. *See* Keystone-Conemaugh Br. 31–52; PADEP Br. 25–32. Because the daily NOx emission limits are based on the rolling thirty-day limits, Petitioners focus their arguments on the EPA's explanations and the Agency's evidentiary support for its methodology.[11] *See* Keystone-

[11] Petitioners urge that beyond the purportedly faulty methodology used to develop the emission limits in the final rule, the EPA violated the Clean Air Act by failing to provide a sufficiently detailed explanation of its "novel" weighed-rates

approach and the underlying data used to develop the values in its proposed FIP. Homer City Br. 29. Petitioners claim this deprived them of a meaningful opportunity to review the EPA's decision and forced them to guess how the Agency calculated the limits for their EGUs. *See* Homer City Br. 27–30; JA 627–29, 636 (commenting that the description of the proposed FIP's methodology was inadequate to allow for independent review). Under the Clean Air Act, the EPA must include in its notice of proposed rulemaking: "the factual data on which the proposed rule is based;" "the methodology used in obtaining the data and in analyzing the data;" "the major legal interpretations and policy considerations underlying the proposed rule;" and "[a]ll data, information, and documents . . . on which the proposed rule relies[.]" 42 U.S.C. § 7607(d)(3)(A)–(C) (explaining the requirements for publication of a proposed rulemaking). The EPA did so here. The Agency explained the challenges with determining RACT limits for the facilities and its weighted-rates solution that considered the EGUs' baseload and cycling operations. 87 Fed. Reg. 31798, 31803–07 (May 25, 2022); JA 482–95. The EPA also provided the formula it used to calculate the limits, its calculations, and "[a]ll of the data [the] EPA used to develop the proposed emission limits . . . was either available in the docket, or, because of file type and size limitations . . . available on request." 87 Fed. Reg. 53381, 53394 (Aug. 31, 2022). So, contrary to Petitioners' assertions, having been provided with this information, they did not need to speculate how the EPA calculated the limits for their EGUs. Indeed, Montour requested the data from the EPA and clearly understood the proposed methodology well enough to "replicate and/or modify [the] EPA's methodology." 87 Fed. Reg. 53381, 53394 (Aug. 31, 2022); *see also* Montour Br. 6,

Conemaugh Br. 51–52.

i. The FIP's Emission Limits are Reasonable

First, Petitioners stress that the EPA's use of historical ozone-season data was arbitrary and capricious because the EPA assumed that the data were representative of the facilities' current operations and equipment capabilities. Homer City Br. 32; Keystone-Conemaugh Br. 33–34. Petitioners urge that the EPA's justification for its choice—that it had previously determined in two other rulemakings that historical emissions data were representative of current performance—was an inadequate substitute for conducting a statistical analysis of the available data in this matter to determine whether there were any significant changes from year to year that could have rendered the data unrepresentative. Homer City Br. 32–33; Keystone-Conemaugh Br. 33. Petitioners claim that by failing to conduct such an analysis, the EPA did not consider technical, regulatory, and economic changes that occurred during the nineteen-year data set that could have affected its representativeness of current unit operations, including: the EGUs' shift from baseload to cycling operations; the higher cost of NOx allowances during 2003 to 2011; and changes to control technology. Homer City Br. 33–34. We disagree.

Upon review of the record, we find that the EPA articulated a "satisfactory explanation" for why it could use

---

10, 20. Montour engaged with the EPA during the comments process and even helped the Agency by submitting more accurate SCR threshold data for its facility, which the EPA used when calculating Montour's final emission limits. *Id.* at 53397.

historical ozone-season data in developing its emission limits.[12] *Prometheus Radio Project v. FCC*, 373 F.3d 372,

[12] Petitioners' claim that the EPA failed adequately to explain why it used different time periods and averaging periods to develop its weighted rate approach also fails. Homer City Br. 40–41. The EPA explained how it developed its weighted rate methodology and why it relied on certain data sets when calculating certain variables. Specifically, the EPA observed SCR thresholds from the 2003 to 2021 ozone seasons to determine the operating threshold at which the facilities could run their SCR controls. 87 Fed. Reg. 31798, 31804 (May 25, 2022). The EPA considered the 2015 to 2021 ozone seasons for Conemaugh's EGUs because SCR controls were not installed until 2014. JA 493. When the EPA developed the SCR-on rate for the facilities (except Conemaugh), it explained that it chose the third-best ozone season from the 2003 to 2021 ozone seasons because it accounted for degradation of control equipment over time and avoided biasing the limit with uncharacteristically low emitting days or uncharacteristically optimal operating conditions. 87 Fed. Reg. 53381, 53384 (Aug. 31, 2022); JA493. The EPA used the second-best ozone season from the period from 2015 to 2021 for Conemaugh because its SCR controls on its facilities were not installed until 2014, and because the average ozone season NOx emission rates varied significantly over the time period. JA 493. The EPA derived the SCR weights from a more limited data set—the 2011 to 2021 ozone seasons—because the Agency determined that consistent with the trends it observed in the historical data set, this period was likely representative of the period during which the EGUs began to exhibit greater cycling operations. 87 Fed. Reg. 53381, 53384 (Aug. 31, 2022). In sum, the EPA articulated a basis for why

389–90 (3d Cir. 2004), *as amended* (June 3, 2016). The EPA made clear that a major challenge in developing emission limits for the facilities was their shift from baseload to cycling operations. 87 Fed. Reg. 31798, 31802–03 (May 25, 2022); JA 482–84. The EPA further explained that to identify the appropriate RACT limits for these sources, it needed to examine the units' historical data to determine the emission rates these sources were capable of meeting when operating their SCR controls. 87 Fed. Reg. 53381, 53383, 43392 (Aug. 31, 2022). This involved analyzing when and how the units ran their SCR controls, as well as the regulatory landscape that influenced operators' decisions to use the SCR systems. Indeed, the record indicates that the EPA examined how the changing regulatory framework influenced SCR performance during the data set, concluding that the units were capable of meeting lower emission limits when it was economically advantageous to do so. *Id.* at 53390; *see also id* at. 53395 (acknowledging a "correlation between increased SCR operation (and correspondingly lower NOx emissions), and periods when new regulatory requirements . . . have created meaningfully more stringent NOx emission budgets[, which] . . . can compel EGUs to operate their SCRs more often and at lower NOx emission rates[.]"). EPA also considered whether the regulations in question affected the representativeness of the data. *Compare id.* at 53397 (concluding that the facilities could comply with Mercury and Air Toxin Standards ("MATS") and reduce their NOx emissions simultaneously, meaning that emissions data preceding MATS was still representative), *with id.* at 53392 (concluding that cap and trade programs that did not require

---

the different historical periods were selected and how they were used to develop its methodology.

the facilities to meet firm emissions limits rendered non-ozone season data unrepresentative of SCR performance). This included considering how NOx allowance prices either encouraged or discouraged SCR system use. *See, e.g.*, *id.* at 53390. The EPA also accounted for cycling behavior by observing the periods in the data set that reflected these operations and moderated the historical performance by using more recent data to weight the emission limits. In these circumstances, we find that the EPA's use of historical data to set emissions limits was not arbitrary or capricious.

Relatedly, Petitioners fault the EPA for failing to cite evidence to support its use of historical ozone-season data to set emission limits applicable to the entire year. Keystone-Conemaugh Br. 35; Homer City Br. 35. Petitioners criticize the Agency's justifications for the choice: that historical non-ozone-season did not reflect SCR systems' true performance because the SCR controls were not often operated and the regulatory scheme at the time permitted facilities to purchase NOx emissions allowances that discouraged emission reduction; that EGUs in other states were subject to similar regulations and could achieve similar limits; and that historical data showed that certain facilities, like Keystone, were capable of meeting the NOx limits in non-ozone-season months when operating their SCR controls. 87 Fed. Reg. 53381, 53392, 53395 (Aug. 31, 2022). In response to the Agency's justifications, Petitioners urge that that the EPA's distinctions between unit operations as reflected in historical ozone- and non-ozone season data demonstrate the logical fallacy of applying rates based exclusively on ozone-season data to the whole year. Keystone-Conemaugh Br. 34. Additionally, Petitioners argue that the EPA did not articulate a rational basis for why EGUs in other states and subject to different regulatory

regimes were appropriate or relevant points of comparison to Petitioners' EGUs. Keystone-Conemaugh Br. 38.

Here, the EPA offered a reasonable explanation for why it used ozone-season data to calculate the FIP's year-round emission limits. *See Prometheus Radio Project*, 373 F.3d at 389–90. This ozone-season data reflected a period of increased electrical operations from greater demand and demonstrated the emission levels the EGUs could achieve when there are additional regulatory constraints and economic incentives to encourage operators to reduce emissions. 87 Fed. Reg. 53381, 53392, 53395 (Aug. 31, 2022); *see also Sierra Club*, 972 F.3d at 301 (faulting the EPA for relying on emission rates that were "achieved *voluntarily*" and "[a]bsent any regulatory pressure whatsoever" in setting emission limits). Moreover, the EPA moderated the ozone-season data's impact on the final emission limits by weighting those values to account for the EGUs increased cycling operations, thus acknowledging the present and likely performance of the units. The EPA also noted that non-ozone season data was unrepresentative of the SCR systems' true performance capabilities because for substantial periods of time during the data set, the units were not required to meet a specific NOx emission rate, nor did they operate their controls for significant periods of time outside of the ozone season. *See id.* at 53392.

Contrary to Petitioners' assertion that the EPA engaged in the same speculative comparison to out-of-state facilities that resulted in our vacatur of the 2016 SIP in *Sierra Club*, *see* 972 F.3d at 301–03, the EPA provided a reasoned explanation for the comparison. *See* 87 Fed. Reg. 31798, 31808 (May 25, 2022). The EPA analyzed operating and emissions data from out-of-state facilities, which are equipped with SCR controls

operating on a year-round basis and are also contractually obligated to PJM. 87 Fed. Reg. 31798, 31808 (May 25, 2022).; 87 Fed. Reg. 53381, 53395 (Aug. 31, 2022). After reviewing the out-of-state facilities' data, the EPA determined that those facilities experienced comparable changes in operations and load levels but did not exhibit the same level of excess emission levels as the Pennsylvania units.[13] 87 Fed. Reg. 31798, 31808 (May 25, 2022); 87 Fed. Reg. 53381, 53395 (Aug. 31, 2022). After this data analysis, the EPA was able to conclude there "was nothing unique about the operating patterns of the units in Pennsylvania" which would explain this difference. 87 Fed. Reg. 31798, 31808 (May 25, 2022). It was not arbitrary or capricious for the EPA to use these out-of-state facilities—which are subject to similar market forces and operational trends as the Pennsylvania EGUs and achieve emission levels similar to the final emission limits in the FIP—as points of comparison. Their performance and emission levels reinforced the reasonableness and technological and economic feasibility of the FIP's limits derived from the Pennsylvania facilities' own operating data.

Next, Petitioners urge that the emission limits are arbitrary and capricious because the EPA failed to cite any evidence supporting its selection of the affected units' second-

[13] In these circumstances, where the EPA compared the Pennsylvania EGUs performance to similar, SCR-equipped, out-of-state EGUs running their controls year-round, in an effort to determine whether there were any state-specific conditions that caused Pennsylvania's EGUs to emit greater NOx emission levels, we believe that the agency has sufficiently "show[n] its work." *Nat'l Parks Conservation Ass'n v. EPA*, 803 F.3d 151, 167 (3d Cir. 2015).

or third-best ozone season "as a proxy for the SCR systems' current performance condition." Keystone-Conemaugh Br. 34; Homer City Br. 38. Petitioners claim that it was unreasonable for the EPA to justify its choice by citing to its use in two previous rulemakings and to assume that these ozone years accurately reflected the current performance of the facilities' SCR systems, which degrade over time. Keystone-Conemaugh Br. 33–34.

As an initial matter, Petitioners are mistaken that the EPA selected the units' second- or third-best ozone season exclusively as proxy for the units' SCR systems' current operational performance. 87 Fed. Reg. 53381, 53395 (Aug. 31, 2022); *see also id.* at 53395 (explaining that equipment degradation was a "contributing factor" but "not the only consideration [the EPA] evaluated when selecting the third-best approach"). Rather, the EPA explained that it selected the units' third-best ozone season to determine RACT because doing so would avoid "biasing the SCR-on limit with uncharacteristically low emitting ozone seasons, or under uncharacteristically optimal operating conditions." *Id.* at 53391. The EPA relied on the RACT standard, which does not require the sources to "achieve the absolute lowest level of emissions that is technologically possible . . . to satisfy RACT," *Sierra Club*, 972 F.3d at 302, when it decided against using ozone seasons that reflected better SCR system performance, as it concluded that emission performances reflected in those ozone seasons might not again be achievable due to aging control technology. 87 Fed. Reg. 53381, 53392 (Aug. 31, 2022). Lastly, the EPA's referral to previous rulemakings, which it used to support the reasonableness of its selection, reflects a reasonable reliance on its expertise where, as here, its selection of the third-best ozone season was

supported by historical data. *See Prometheus Radio Project*, 373 F.3d at 417 ("[W]e must uphold an agency's line-drawing decision when it is supported by the evidence in the record.").

Petitioners also argue that the EPA's use of the second-best ozone season data for the Conemaugh facility instead of the third-best ozone season data used for the other facilities invalidates its entire emissions limit methodology. Keystone-Conemaugh Reply Br. 21–24; Homer City Br. 39. Petitioners point out that the EPA decided to use the second-best ozone season data for Conemaugh's EGUs after its calculations relying on the EGUs' third-best ozone season data returned comparatively higher emission limits for Conemaugh's units. Keystone-Conemaugh Reply Br. 22; 87 Fed. Reg. 53381, 53393 (Aug. 31, 2022). Petitioners urge that the EPA's explanation for the Conemaugh calculation does not relate to equipment degradation, which Petitioners contend was the primary reason the Agency offered for using the third-best ozone season. Homer City Br. 39. Petitioners explain that these unexpected results for the Conemaugh facility obligated the EPA to reevaluate its methodology or identify facts in the record that supported its conclusion to use the second-best ozone season data for the facility. Keystone-Conemaugh Reply Br. 23.

Having reviewed the record, we are satisfied with the EPA's explanation for its use of the second-best ozone season data for the Conemaugh facility. *See Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 43. The Agency explained that the comparatively high proposed emission limits for Conemaugh calculated using the weight derived from the third-best ozone season stemmed from selecting the third-best ozone season from a more limited data set. 87 Fed. Reg. 53381, 53400 (Aug.

31, 2022). Conemaugh's shorter data set contained periods when NOx allowance prices declined, which would have disincentivized Conemaugh from achieving the lowest possible emissions. *Id.* at 53393; *see also* JA 490 (observing an increase in NOx emission rates at some SCR-controlled EGUs as NOx allowance prices declined between 2017 and 2020). The Agency determined that using weights derived from the third-best ozone season from Conemaugh's more limited data set produced emission limits that were analogous to the facility's mean rates. 87 Fed. Reg. 53381, 53400 (Aug. 31, 2022). Having been admonished for approving emission limits in the 2016 SIP that effectively amounted to the average pollution output of three of the affected facilities, it was reasonable for the EPA to adjust the formula for Conemaugh to ensure that its limits were RACT-compliant. *See Sierra Club*, 972 F.3d at 300 ("an average of the current emissions being generated by existing systems, will not usually be sufficient to satisfy the RACT standard.").

Petitioners also urge that the EPA made unsupported assumptions about the facilities' obligations to PJM. Keystone-Conemaugh Br. 39–42. PJM is a grid operator that provides wholesale electricity in thirteen states and the District of Columbia, and "generally directs the day-to-day and hour-to-hour dispatch" of Petitioners' units. 87 Fed. Reg. 53381, 53397 (Aug. 31, 2022); *see also id.* at 53382 n.5. The EGUs supply their energy by bidding into the PJM electricity market. *Id.* at 53382. Petitioners contend the EPA failed to consider the operational control that PJM exerts over the facilities when it formulated the FIP's emission limits. Keystone-Conemaugh Br. 28. They argue that because the EPA does not have special expertise in the realm of power delivery and grid reliability, its assumptions that Petitioners would be able to "consider their

emission limits when developing the information they supply to PJM" and that PJM would in turn consider those limits when determining "subsequent dispatch instructions" were arbitrary and capricious. 87 Fed. Reg. 53381, 53398 (Aug. 31, 2022).

Although the EPA understood that PJM was generally responsible for dispatch of the affected EGUs, it explained that the facilities had the ability to influence PJM's dispatch instructions through their offer prices and with operating parameters they provide to PJM. 87 Fed. Reg. 53381, 53397 (Aug. 31, 2022). PJM considers these parameters—which relate to operations such as unit start-ups, extended low-load operations, and output changes—when making its dispatch decisions. *Id.*; *see also id.* at 53398 & n.51. The EPA also corroborated its assumption based on a comparative analysis of 2021 and 2022 ozone season data from the Keystone and Conemaugh units. *Id.* at 53398–99. The EPA found that the Keystone and Conemaugh Generating Stations appeared to receive an exception in 2022 based on operating parameters provided to PJM, as the units' so-called "Turn Down Ratio" was below the ratio's default floor value applicable in the absence of such an exception. *Id.* at 53398 n.51; *see also id.* at 53399. The EPA also considered Keystone-Conemaugh's claim that it would be obligated to forfeit dispatch opportunities an admission that PJM did not have undisputed control over the facilities' operations. *Id.* at 53398–99. As a result, the EPA reasoned that the facilities could provide PJM with operational parameters to help them avoid dispatch instructions from PJM that would require low-load operations (with potentially suboptimal SCR performance). *Id.* In these circumstances, we find that the EPA articulated a rational basis for its conclusion. *See Sierra Club,* 972 F.3d at 298.

ii. The FIP's Emission Limits Satisfy RACT Standards

In addition to their claims that the emission limits in the FIP are unreasonable, Petitioners also urge that the limits do not meet RACT standards because they are not technologically or economically feasible.[14] Keystone-Conemaugh Br. 42.

First, Petitioners claim that the FIP does not comply with RACT because the EPA did not conduct unit-specific technological and economic feasibility analyses, and that its statistical analysis is an inadequate substitute. Homer City Br. 30–31; PADEP Br. 26–29. Petitioners explain that without this

[14] PADEP goes a step further, arguing not only that the emission limits are technologically and economically unfeasible, but that the EPA's selection of SCR controls without analysis or consideration of other control technologies renders its RACT analysis invalid. PADEP Br. 31–32. Yet PADEP itself determined in its 2016 SIP and 2022 SIP that SCR controls represent appropriate RACT-level control technology. 87 Fed. Reg. 53381, 53387 (Aug. 31, 2022); JA 482–83. The EPA agreed with that assessment, which was never challenged, when it approved the 2016 SIP, and continued to agree with it when formulating the FIP. 87 Fed. Reg. 53381, 53387 (Aug. 31, 2022); JA 483. PADEP also conducted an analysis of other potential control technologies and, apart from boiler tuning, rejected them. 87 Fed. Reg. 53381, 53387–88 (Aug. 31, 2022). Because SCR controls are present and operating at each of the EGUs, and because the EPA explained that its adoption of SCR controls as RACT-level control technology was consistent with PADEP's previous analysis and findings, it was reasonable for the EPA not to evaluate other technologies in its RACT analysis.

EGU-specific analysis, the EPA's presumptions about each source's operational and emissions-reduction capabilities are speculative and not RACT-compliant. Homer City Br. 31. Here, it is difficult to envision how the EPA's limits are not source-specific when they are derived from the individual EGUs' historical operating data.[15] JA 491–95. Similarly, we find the EPA's use of statistical analysis of historical data reasonable when it is not prohibited by statute or the EPA rules or guidance, and where the EPA explained the adjustments it made to account for factors in the units' historical data that may have affected the data set's reflection of the units' lowest achievable rates. 87 Fed. Reg. 53381, 53387 (Aug. 31, 2022).

Next, Petitioners argue that the EPA's weighted rates approach fails to account for the EGUs' shift from baseload to cycling operations and results in emission limits that are not technically and economically feasible. Keystone-Conemaugh Br. 43–45. Petitioners explain that the EPA's use of ozone-season data biased the results of its analysis toward EGU operations with SCR controls engaged and thus "arrived at limits that are not technologically feasible." Keystone-Conemaugh Reply Br. 19. Additionally, Petitioners urge that the EPA's selection of the second- or third-best ozone season data to set the SCR-on and -off weights further biased the limits toward SCR operation because those data "are not typical of . . . cycling operations" and produced technologically infeasible limits. Keystone-Conemaugh Reply Br. 20–21; Keystone-Conemaugh Br. 44–45.

---

[15] We also note that Petitioner PADEP appears to concede that emission limits in the FIP are in fact source-specific. *See* PADEP Reply Br. 8–9.

Here, EPA took steps to account for the EGUs' increased cycling operations when developing its emissions methodology. EPA's weighted rate limits are designed to encourage improvements in SCR performance by acknowledging the historical effectiveness of the control technology's emission reduction capabilities and the more recent cycling behavior that can hinder SCR performance. This goal is consistent with RACT, which, as we have already explained, is a technology-forcing standard designed to reduce pollution from existing sources. *Sierra Club*, 972 F.3d at 294. EPA recognized that the units have exhibited more frequent cycling behavior—and thus more periods of operation without SCR controls engaged—over the past decade and used data from this timeframe[16] to calculate the SCR-on and -off weights in its formula to account for this operational reality. *See* 87 Fed. Reg. 53381, 53384, 53396 (Aug. 31, 2022); *see also* JA 493 (explaining that the 2011 to 2021 ozone seasons were "likely representative of the time period when the units began to exhibit a greater cycling pattern").

In addition, the EPA's decision to average the NOx emission rate over thirty days and across units within a facility gives Petitioners an easier path to compliance. 87 Fed. Reg. 53381, 53396 (Aug. 31, 2022). This accounts for cycling behavior in two ways. First, the thirty-day average permits operators to offset periods where their EGUs operate above the limit (and presumably without their SCR controls running) with periods of optimal operation where the units operate

[16] Petitioner Keystone-Conemaugh incorrectly asserts that the EPA calculated the SCR-on and -off weights by considering the entire period since the EGUs' SCR systems were installed. Keystone-Conemaugh Br. 43.

below the limit (when their SCR controls presumably are running). *Id.* Second, the facility-wide aspect of the average permits operators to average the suboptimal, above-limit performance of one EGU, which may be exhibiting more frequent cycling behavior, with the optimal, below limit performance of another. *Id.* The FIP's limits thus accounted for the EGUs cycling behavior. *See Sierra Club*, 792 F.3d at 295 (explaining that technological feasibility considers, *inter alia*, the "source's process and operating procedures").

In addition, data in the record shows that these sources are capable of meeting the limits. Indeed, past historical data reflects that each affected unit has met the FIP limits.[17] JA 495. The EPA also explained that very recent performance data from the affected units indicates that they can comply with the FIP limits, even while engaging in more frequent cycling behavior. *See* 87 Fed. Reg. 53381, 53390–91 (Aug. 31, 2022) ("[D]ata for some of these units from May through June of the 2022 ozone season generally indicate SCR operating patterns (and, as a result NOx emissions) that match or are among their best in the recent data record."). In these circumstances, we find that the EPA did not bias the limits toward SCR-on operations in such a way that rendered them technologically infeasible.

[17] Moreover, in response Keystone-Conemaugh's comments that some of its EGUs would not be able to meet the thirty-day facility-wide average emission rate if there was one cold start-up in a thirty-day period, the EPA reviewed unit startup data during non-ozone season months and found that one of the EGUs was able to achieve the thirty-day emission rate in the final rule after a cold startup, even without the regulatory pressure to do so. 87 Fed. Reg. 53381, 53396 (Aug. 31, 2022).

Petitioners also argue that the limits are not RACT-compliant because the EPA did not conduct an appropriate economic feasibility analysis. Homer City Br. 41. In particular, Petitioners claim that the EPA's failure to consider source-specific capital[18] and maintenance costs by assuming that the EGUs could meet the emission limits simply by optimizing their existing operations was arbitrary and capricious. Homer City Br. 41. In addition, Petitioners urge that the limits are not economically feasible because the cost of new or upgraded equipment is disproportionate to the amount of pollutant reduction achieved. Homer City Br. 43. Moreover, Petitioners urge that the EPA failed to consider that the units' cycling operations would require them to increase ammonia injections in order to more aggressively control NOx emissions, and that this action would lead to accelerated maintenance costs. Keystone-Conemaugh Br. 48.

---

[18] After the issuance of the FIP, an engineering firm retained by Homer City to evaluate its facility's ability to comply with the FIP's emission limits concluded that two of the facility's three units would require costly upgrades to their ammonia vaporizers to comply. Homer City Br. 42–43 n.7. This study was issued after the notice and comment period, however, so we may not consider it when evaluating the EPA's decision. *See Am. Petroleum Inst. v. Costle*, 665 F.2d 1176, 1186 n.3 (D.C. Cir. 1981); 42 U.S.C. § 7607(d)(7)(A). And, if we were to consider the report, it is noteworthy that it concluded that one of Homer City's EGUs can comply with the FIP without any additional upgrades, *see* Homer City Br. 42–43 n.7, demonstrating that at least one of the "sources in [the] source category ha[s] in fact applied the control technology in question." *Sierra Club*, 972 F.3d at 295.

Here, the EPA considered record evidence and did not find that capital expenditures were necessary for compliance. 87 Fed. Reg. 53381, 53388–89 (Aug. 31, 2022). The Agency also found that historical operating data, as well as data from a portion of the 2022 ozone season, indicated that the EGUs could meet the limits with existing controls and without injecting excessive amounts of ammonia during unfavorable SCR operating conditions. *Id.* at 53390. Although Petitioners may wish to upgrade their equipment or inject additional ammonia to maintain their current levels of profitability, these market considerations have no bearing on the RACT analysis. *See Sierra Club*, 972 F.3d at 295.

Petitioners also argue that the limits are economically infeasible because they would have to forfeit potential dispatch opportunities with PJM to comply with the limits. Keystone-Conemaugh Br. 44. But Petitioners' purported costs are actually profit opportunities that Petitioners may have to forego, and not costs associated with reducing emissions to comply with the FIP. *See Sierra Club*, 972 F.3d at 295 (explaining that economic feasibility concerns the cost of reducing emissions and not the ability of a particular source to afford to reduce emissions). Although Petitioners will have to reevaluate their operations to comply with the FIP, lost potential revenues do not factor into the economic-feasibility analysis. *See* 57 Fed. Reg. 18070, 18074 (Apr. 28, 1992).

Lastly, Petitioners argue that the EPA's daily mass limit for each EGU fails to satisfy RACT because it is based on the facility-wide thirty-day limit, which Petitioners contend is not source-specific and does not consider source-specific design parameters. Keystone-Conemaugh Br. 51–52; Homer City Br.

46–50. We disagree. The daily mass limit for each unit is based on two source-specific metrics: each unit's maximum capacity and the facility-wide limit. 87 Fed. Reg. 31798, 31806 (May 25, 2022); JA 494–95. Again, as we have already discussed, the facility-wide thirty-day limit is source-specific and considers source-specific design parameters because it is based on actual operating data from each affected unit. 87 Fed. Reg. 31798, 31806 (May 25, 2022); JA 494–95. The EPA also observed from emission data following its FIP proposal that when the EGUs operated within the thirty-day limits, they generally achieved the daily mass limits. 87 Fed. Reg. 53381, 53396 (Aug. 31, 2022).

In sum, we reject Petitioners' critiques of the FIP's emission limits, as they satisfy RACT and are not arbitrary and capricious.[19] *Cf. Midwest Ozone Grp.*, 61 F.4th at 193 (denying petition for review when the record demonstrated that

[19] We find it compelling that Montour does not challenge the emission limits for the two EGUs at its generating station, which it believes may be reasonably achieved and satisfy RACT as technologically and economically feasible. Montour Br. 10. Petitioners do not challenge the limits for the Montour EGUs, but those limits were determined using the same underlying weighted rates methodology. Montour Br. 12; *see* 87 Fed. Reg. 53381, 53402–03 (Aug. 31, 2022) (applying the same weighed-rate methodology to each affected facility). Although Montour's acquiescence to the emission limits does not make them reasonable or RACT-compliant per se, its engagement with the EPA in the same rulemaking process that resulted in the emission limits for the other affected EGUs further supports our finding that the EPA acted reasonably in promulgating comprehensible emission limits in the FIP.

the EPA "chose[] analytical techniques rationally connected" to the rule and "appropriately explained" methodology).

IV

For the foregoing reasons, we will uphold the FIP and deny the petition for review. We hold that the EPA properly exercised its authority under the Clean Air Act by partially disapproving the 2016 SIP and promulgating the FIP. We also hold that the contents of the FIP are not arbitrary, capricious, or abusive of the EPA's discretion.