United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA CIRCUIT

Argued November 3, 2023 Decided May 14, 2024

No. 22-1210

SINCLAIR WYOMING REFINING COMPANY LLC AND SINCLAIR CASPER REFINING COMPANY LLC,
APPELLANTS

v.

ENVIRONMENTAL PROTECTION AGENCY,
APPELLEE

AMERICAN PETROLEUM INSTITUTE, ET AL.,
INTERVENORS

Consolidated with 22-1225, 22-1227, 22-1228, 22-1229, 22-1230, 22-1231

On Petitions for Review of a Final Action of the Environmental Protection Agency

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Elizabeth B. Dawson and *Jeffrey R. Holmstead* argued the causes for petitioners American Fuel & Petrochemical Manufacturers and All Other Obligated Party Petitioners. With them on the briefs were *Rober J. Meyers*, *Jonathan G. Hardin*, *LeAnn Johnson*, *Alexandra Magill Bromer*, *Brittany M.*

Pemberton, *Richard S. Moskowitz*, *Tyler J. Kubik*, *Samuel P. Hershey*, *Thomas E. Lauria*, and *Andrew K. Gershenfeld*. *Thomas A. Lorenzen, Taylor R. Pullins*, *Eric B. Wolff*, and *Karl J. Worsham* entered appearances.

William C. Perdue argued the cause for BioFuels Petitioners. With him on the briefs were *Matthew W. Morrison*, *Cynthia Cook Robertson*, *Shelby L. Dyl*, *Ethan G. Shenkman*, and *Jonathan S. Martel.*

Amir C. Tayrani was on the brief for *amici curiae* Monroe Energy, LLC and PBF Holding Company, LLC in support of Obligated Party Petitioners.

Kimere J. Kimball and *Caitlin McCusker,* Attorneys, U.S. Department of Justice, argued the causes for respondent. With them on the brief was *Todd Kim*, Assistant Attorney General. *John H. Martin*, Attorney, entered an appearance.

Thomas R. Brugato argued the cause for intervenors American Petroleum Institute and American Fuel & Petrochemical Manufacturers in support of respondent. With him on the brief were *Robert J. Meyers*, *Elizabeth B. Dawson*, *Richard S. Moskowitz*, *Tyler Kubik*, *Robert A. Long, Jr.*, *Kevin F. King*, *Daniel G. Randolph*, *Makade C. Claypool*, *John Wagner*, and *Michele Schoeppe.*

Bryan Killian, *Douglas Hastings*, *David M. Lehn*, *Matthew W. Morrison*, and *Shelby L. Dyl* were on the brief for BioFuel Intervenors in support of respondents. *Jonathan S. Martel* entered an appearance.

Before: SRINIVASAN, *Chief Judge*, PILLARD and KATSAS, *Circuit Judges*.

Opinion for the Court filed by *Circuit Judge* PILLARD.

Opinion concurring in part and dissenting in part filed by *Circuit Judge* KATSAS.

PILLARD, *Circuit Judge*: This is the latest dispute over EPA's implementation of the Clean Air Act's Renewable Fuel Standards Program. 42 U.S.C. § 7545(o). Designed to promote energy independence and curb greenhouse gas emissions, the Program requires the petroleum industry to introduce increasing volumes of renewable fuel from year to year into the nation's transportation fuel supply. In creating the Program, however, Congress dramatically overestimated the speed at which domestic production of renewable fuel could expand, leading EPA year after year to reduce the statutorily required renewable fuel requirements. These reductions almost invariably trigger litigation. The renewable fuel industry argues the reductions are too large, while the petroleum industry argues they are not large enough. We have resolved challenges to the Program's renewable fuel requirements for every year between 2010 and 2019.[1]

[1] *See Nat'l Petrochem. & Refiners Ass'n v. EPA*, 630 F.3d 145 (D.C. Cir. 2010) (2010 renewable fuel standards); *Am. Fuel & Petrochem. Mfrs. v. EPA*, No. 12-1249 (D.C. Cir. Dec. 17, 2012) (2011 renewable fuel standards); *Am. Petroleum Inst. v. EPA*, 706 F.3d 474 (D.C. Cir. 2013) (2012 renewable fuel standards); *Monroe Energy, LLC v. EPA*, 750 F.3d 909 (D.C. Cir. 2014) (2013 renewable fuel standards); *Ams. for Clean Energy v. EPA*, 864 F.3d 691 (D.C. Cir. 2017) (2014, 2015, and 2016 renewable fuel standards); *Alon Refin. Krotz Springs, Inc. v. EPA*, 936 F.3d 628 (D.C. Cir. 2019) (2017 and 2018 renewable fuel standards); *Am. Fuel & Petrochem. Mfr. v. EPA*, 937 F.3d 559 (D.C. Cir. 2019) (2018 renewable fuel standards); *Growth Energy v. EPA*, 5 F.4th 1 (D.C. Cir. 2021) (2019 renewable fuel standards).

Today, we resolve challenges to the standards for the years 2020, 2021, and 2022. Once again, renewable fuel producers claim that EPA's standards are set too low, while petroleum refiners contend they are too high. We hold that EPA complied with the law and reasonably exercised its discretion in setting the renewable fuel requirements for the three years at issue. We therefore deny the petitions for review.

BACKGROUND

A.

Enacted in 2005 and amended in 2007, the Renewable Fuel Standards Program (Program) "requires that increasing volumes of renewable fuel be introduced into the Nation's supply of transportation fuel each year." *Ams. for Clean Energy v. EPA* (*ACE*), 864 F.3d 691, 697 (D.C. Cir. 2017). "To accomplish these goals, the Program regulates suppliers through 'applicable volume[s]'—mandatory and annually increasing quantities of renewable fuels that must be 'introduced into commerce in the United States' each year—and tasks the EPA Administrator with 'ensur[ing]' that those annual targets are met." *Am. Fuel & Petrochem. Mfr. v. EPA* (*AFPM*), 937 F.3d 559, 568 (D.C. Cir. 2019) (quoting 42 U.S.C. § 7545(o)(2)(A)(i)). "[B]y requiring upstream market participants . . . to introduce increasing volumes of renewable fuel into the transportation fuel supply, Congress intended the Renewable Fuel Program to be a market forcing policy that would create demand pressure to increase consumption of renewable fuel." *Id.* (internal quotation marks omitted).

We have extensively described the statutory scheme in various opinions, most recently in *American Fuel & Petrochemical Manufacturers*, 937 F.3d at 568-73. Here is a more streamlined summary:

"The Program specifies annual fuel-volume requirements for four overlapping categories of fuel." *Id.* at 568. Those categories are: (i) cellulosic biofuel; (ii) biomass-based diesel; (iii) advanced biofuel; and (iv) total renewable fuel. 42 U.S.C. § 7545(o)(2)(B)(i)(I)-(IV). "Those four fuel categories vary with respect to the renewable biomass sources from which they are derived and their greenhouse gas emissions." *ACE*, 864 F.3d at 697 (citing 42 U.S.C. § 7545(o)(1)(B), (D), (E), (J)). "The statutory categories of fuel types are 'nested,' meaning that cellulosic biofuel and biomass-based diesel are kinds of advanced biofuel, and advanced biofuel in turn is a kind of renewable fuel that may be credited toward the total renewable fuel obligation." *Id.* at 697-98. Renewable fuel that is not advanced biofuel is "conventional biofuel." 42 U.S.C. § 7545(o)(1)(F). By the same token, we refer to advanced biofuel that is not cellulosic biofuel—including biomass-based diesel—as non-cellulosic advanced biofuel. The volumes of total renewable fuel and advanced biofuel that may respectively be made up of conventional renewable fuel and non-cellulosic advanced biofuel are referred to as "implied statutory volume[s]." *See, e.g.*, Renewable Fuel Standard Program: RFS Annual Rules, 87 Fed. Reg. 39,600, 39,623 n.127 (July 1, 2022).

"The statute contains tables that set forth the annual volume requirements for each category of renewable fuel." *ACE*, 864 F.3d at 698. For 2006, the first year of the Program, "Congress ordained the inclusion of 4 billion gallons of renewable fuel in the Nation's fuel supply." *HollyFrontier Cheyenne Refin., LLC v. Renewable Fuels Ass'n*, 141 S. Ct. 2172, 2175 (2021) (citing 42 U.S.C. § 7545(o)(2)(B)(i)(I)). By 2022, that number was supposed to "climb to 36 billion gallons," including 21 billion gallons of advanced biofuel, 16 billion gallons of which were to be cellulosic biofuel. *Id.*; 42 U.S.C. § 7545(o)(2)(B)(i)(II), (III). The 2022 volumes also

contain implied statutory volumes of 15 billion gallons of conventional biofuel and five billion gallons of non-cellulosic advanced biofuel. The statute does not set the requisite amounts for years after 2022 (or, in the case of biomass-based diesel, 2012). Congress instead "largely left it to [EPA] to set the applicable volumes." *HollyFrontier*, 141 S. Ct. at 2175. EPA must do so "based on a review of the implementation of the program during" previous years and "an analysis of" six other factors, such as the fuel's effect on "the environment," "energy security," "infrastructure," and "cost to consumers." 42 U.S.C. § 7545(o)(B)(ii).

These statutory volumes, however, have consistently proven infeasible. The volumes for cellulosic biofuel in particular "assumed significant innovation in the industry"—innovation that has not kept pace with the growth the Program projected. *See Am. Petroleum Inst. v. EPA*, 706 F.3d 474, 476 (D.C. Cir. 2013).

Recognizing its market forcing might prove overly ambitious, Congress authorized EPA to adjust the statutory volumes in various scenarios. *See* 42 U.S.C. § 7545(o)(7). Two such provisions are relevant to this case. The first is the cellulosic waiver provision, which requires EPA to reduce the cellulosic volume to the "projected volume" of available cellulosic biofuel for any year in which the "projected volume of cellulosic biofuel production is less than the minimum applicable [*i.e.*, required] volume" of cellulosic biofuel. *Id.* § 7545(o)(7)(D). If that waiver is triggered, EPA "may also reduce the applicable volume of renewable fuel and advanced biofuels requirement . . . by the same or lesser amount." *Id.* EPA has invoked the cellulosic waiver provision in every year since 2010.

The second relevant source of adjustment authority is the reset provision. *Id.* § 7545(o)(7)(F). Under this provision, if EPA waives at least 20 percent of an applicable volume of any renewable fuel for two consecutive years, or waives at least 50 percent for a single year, it "shall promulgate a rule . . . that modifies the applicable volumes . . . for all years following the final year to which the waiver applies." *Id.* In promulgating such a rule, EPA must consider the same factors that inform its ordinary volume-setting decisions. *Id.*

After the applicable volumes are set, EPA must "ensure" they "are met." *Id.* § 7545(o)(3)(B)(i). It does so by setting percentage standards that inform "each obligated party how much of its fuel production must consist of renewable fuels." *Monroe Energy, LLC v. EPA*, 750 F.3d 909, 912 (D.C. Cir. 2014). They are calculated by dividing the applicable volume for each renewable fuel type by an estimate of the national volume of gasoline and diesel that will be used that year (which EPA derives based on an estimate provided by the Energy Information Administration). *See* 42 U.S.C. § 7545(o)(3)(A), (B)(i); 40 C.F.R. § 80.1405(c). For example, if the applicable volume of total renewable fuel is 10 billion gallons and the projected national volume of transportation fuel is 100 billion gallons, the percentage standard would be ten percent. "Thus, if every obligated party incorporates the required percentage of renewable fuel into the gasoline and diesel it sells, the transportation fuel industry as a whole will achieve the established applicable volumes." *AFPM*, 937 F.3d at 587. EPA must promulgate annual percentage standards no later than November 30 of the preceding year for each compliance year through 2022. 42 U.S.C. § 7545(o)(3)(B)(i).

Generally, the obligated parties are refiners and importers of transportation fuel. *See id.* § 7545(o)(3)(B)(ii); 40 C.F.R. § 80.1406(a)(1). There is, however, an exception for small

refineries that produce fewer than 75,000 barrels per day on average. 42 U.S.C. § 7545(o)(1)(K). The statute permits a limited class of small refineries to petition "at any time" for an exemption based on "disproportionate economic hardship." *Id.* § 7545(o)(9)(B)(i); *see HollyFrontier*, 141 S. Ct. at 2181-82.

Obligated parties need not themselves produce or import renewable fuel. "Congress directed EPA to establish a 'credit program' through which obligated parties can acquire and trade credits," and thereby comply with the statute. *ACE*, 864 F.3d at 699 (quoting 42 U.S.C. § 7545(o)(5)). These credits, called RINs—short for "Renewable Identification Numbers"—"serve as the currency of the RFS Program." *Wynnewood Refin. Co., LLC v. EPA*, 77 F.4th 767, 774 (D.C. Cir. 2023). They are generated when renewable fuel is produced in or imported to the United States, and they are valid for twelve months from the date of generation. 42 U.S.C. § 7545(o)(5). "RINs remain attached to the renewable fuel until that fuel is purchased by an obligated party or blended into fossil fuels to be used for transportation fuel," at which point "the RINs become 'separated'" and available to use as compliance credits. *Alon Refin. Krotz Springs, Inc. v. EPA*, 936 F.3d 628, 637 (D.C. Cir. 2019).

RINs "facilitate flexible and cost-effective compliance." *ACE*, 864 F.3d at 699. An obligated party that has accumulated excess RINs can sell them on the market or carry them over to be used to satisfy a portion of the following year's obligations. *See* 42 U.S.C. § 7545(o)(5)(C); 40 C.F.R. § 80.1427(a)(1), (5). Conversely, an obligated party that has not accumulated enough RINs can purchase them on the market or, provided certain conditions are met, carry a deficit forward into the next compliance year. 42 U.S.C. § 7545(o)(5)(D); 40 C.F.R. § 80.1427(b). In addition, if EPA invokes the cellulosic waiver provision, it must "make available for sale cellulosic biofuel

credits," which obligated parties may use, alongside or instead of RINs, to meet their cellulosic biofuel obligations. 42 U.S.C. § 7545(o)(7)(D)(ii). EPA must "determin[e] the exact price of [cellulosic biofuel] credits in the event of a waiver," subject to various restrictions. *Id.* § 7545(o)(7)(D)(iii). "Any [obligated party] may therefore comply with the law thanks to its own blending efforts, the purchase of credits from someone else, or a combination of both." *HollyFrontier*, 141 S. Ct. at 2175.

B.

In July 2022, EPA set volume requirements and resulting percentage standards for the years 2020, 2021, and 2022 for, as relevant here, total renewable fuel, advanced biofuel, and cellulosic biofuel. *See* Renewable Fuel Standard Program: RFS Annual Rules, 87 Fed. Reg. 39,600 (July 1, 2022) (hereinafter Final Rule). The Final Rule also reaffirmed its latest formula for calculating the percentage standards and imposed a supplemental volume requirement in response to the remand from our court in *ACE*, 864 F.3d 691.

1.

The Final Rule established renewable fuel requirements for 2021 and 2022 and modified previously established requirements for 2020. EPA invoked its authority under both the cellulosic waiver provision and the reset provision. In particular, EPA relied on the cellulosic waiver provision and the reset provision to establish the 2020, 2021, and 2022 cellulosic biofuel volumes and the 2022 total renewable fuel and advanced biofuel volumes. EPA relied exclusively on the reset provision to establish the 2020 and 2021 total renewable fuel and advanced biofuel volumes, which are not challenged in these petitions.

EPA acknowledged that it lagged behind the statutory time frame for setting these volumes, making them late and either partially or wholly retroactive. 87 Fed. Reg. at 39,620, 39,622, 39,624. EPA nevertheless relied on precedent of this court that, in its view, authorized late and retroactive fuel volumes, "so long as EPA exercises this authority reasonably." *Id.* at 39,609 n.49 (citing *ACE*, 864 F.3d at 720; *Monroe Energy*, 750 F.3d 909; *Nat'l Petrochem. & Refiners Ass'n v. EPA*, 630 F.3d 145, 154-58 (D.C. Cir. 2010)).

Starting with the cellulosic waiver provision, EPA determined that the "projected volumes of cellulosic biofuel production for 2020, 2021, and 2022 are all significantly less than the volume targets in the statute." *Id.* at 39,606. Therefore, EPA reduced the applicable volumes to the "projected volume available" of cellulosic biofuel. *Id.* Because 2020 and 2021 had "already passed," EPA did not need to rely on projections. *See id.* at 39,617. It simply reduced the applicable volumes to the amount of cellulosic biofuel actually used in those years. *Id.* It lowered the 2020 volume from 10.5 billion to 0.51 billion gallons, and it reduced the 2021 volume from 13.5 billion gallons to 0.56 billion. *Id.* at 39,601; *see also* EPA Regulatory Impact Analysis: Renewable Fuel Standard (RFS) Program: RFS Annual Rules 159 (2022) (RIA) (Joint Appendix (J.A.) 145) (actual volumes). For 2022, EPA reduced the volume from 16 billion gallons to the 0.63 billion gallons it projected would be available that year—a reduction of 15.37 billion gallons. 87 Fed. Reg. at 39,601; *see also* RIA at 175 (J.A. 330) (projected volume available).

Under the discretionary prong of the cellulosic waiver provision, EPA had the option to reduce the advanced biofuel and total renewable fuel volumes by as much as the same amount as it had reduced the cellulosic biofuel volumes. It did so for the 2022 volumes, reducing the advanced biofuel and

total renewable fuel volumes by the same 15.37 billion gallons as it had reduced the cellulosic biofuel volume. 87 Fed. Reg. at 39,608. The advanced biofuel volume was thus reduced from 21 billion gallons to 5.63 billion gallons, and the total renewable fuel volume from 36 billion gallons to 20.63 billion gallons. *Id.* at 39,601, 39,608. Because the 2022 volumes were partially prospective, EPA expected they would "induce the market to produce, import, and consume additional biofuels in 2022." *Id.* at 39,624.

EPA took a different approach for the years 2020 and 2021. Because those years had already passed, EPA determined that the "appropriate volume" for advanced biofuel and total renewable fuel would be the "actual volumes of such fuels available" in those years. *Id.* at 39,608. Such reductions, however, would be larger than permitted under the cellulosic waiver provision. *Id.* For example, the 2020 statutory volume for advanced biofuel was 30 billion gallons, but the amount available was 17.13 billion gallons—meaning the market came up short by 12.87 billion gallons. 42 U.S.C. § 7545(o)(2)(B)(i)(I); 87 Fed. Reg. at 39,601. The cellulosic waiver provision, however, authorized EPA to reduce the 2020 volume by no more than 9.99 billion gallons—the amount it reduced the cellulosic biofuel volume.

To reduce the 2020 and 2021 volumes below what would have been permissible under the cellulosic waiver provision, EPA invoked the reset provision. It determined the reset provision was triggered for all three categories of renewable fuel: cellulosic biofuel, advanced biofuel, and total renewable fuel. 87 Fed. Reg. at 39,607. Therefore, EPA was required to modify the statutory volumes for the years 2020, 2021, and 2022. *See* 42 U.S.C. § 7545(o)(7)(F). After consulting the statutory factors laid out in Section 7545(o)(2)(B)(ii), EPA set the total renewable fuel and advanced biofuel volumes for the

years 2020 and 2021 to the "actual volumes of such fuels available in 2020 and 2021." 87 Fed. Reg. at 39,608. This approach, we have explained, "guards against RIN shortages by ensuring that the quantity of RINs already generated during the relevant year will be adequate to satisfy the renewable fuel standards for that compliance year." *Wynnewood*, 77 F.4th at 783. EPA also used the reset provision as an independent basis to support the various reductions made under the cellulosic waiver provision. 87 Fed. Reg. at 39,608.

2.

The Final Rule also reaffirmed a change EPA first made in 2020 to the formula it used to calculate percentage standards. *See* 87 Fed. Reg. at 39,631-33. As mentioned, in setting the percentage standards, EPA divides the applicable volume for each renewable fuel type by an estimate of the national volume of non-renewable transportation fuel that will be used that year. *See* 40 C.F.R. § 80.1405(c). EPA may, however, "exempt from compliance small refineries experiencing disproportionate economic hardship in complying with their renewable fuel obligations." *AFPM*, 937 F.3d at 587. By permitting some petroleum refiners "to incorporate less renewable fuel into the gasoline and diesel they sell, small refinery exemptions can impede attainment of overall applicable volumes." *Id.* at 588.

"To avoid such a shortfall," EPA has long adjusted the percentage standards applicable to other petroleum refiners and importers to account for small refinery exemptions. *Id.* Until 2020, EPA excluded from the denominator petroleum fuel produced by small refineries already exempted by the time the rule was promulgated. 87 Fed. Reg. at 39,632. But EPA also retroactively granted exemptions to small refineries whose petroleum-based transportation fuel EPA had already calculated into the percentage standards for the upcoming

compliance year. Without further adjustment, those retroactive exemptions from the renewable-fuel requirements hindered the achievement of the applicable renewable-fuel volumes because they artificially inflated the denominator—the nation's total supply of petroleum-based transportation fuel—and thereby reduced the percentage standards applied to nonexempt refiners and importers. *See id.* So, in 2020, EPA changed course. It began excluding from the denominator not only the gasoline and diesel fuel produced by small refineries that had already received an exemption at the time the rule was promulgated but also those fuels produced by small refineries projected to receive an exemption for the coming year. *Id.* In the Final Rule, EPA reaffirmed this new approach. *Id.* at 39,633.

3.

Finally, the Final Rule imposed a supplemental volume requirement for 2022 in response to the *ACE* remand. The statutory total renewable fuel volume for 2016 was 22.25 billion gallons. 42 U.S.C. § 7545(o)(2)(B)(i)(I). In 2015, EPA reduced that volume in two ways, the second of which we held was unlawful. First, EPA invoked the cellulosic waiver provision to reduce the volume by 3.64 billion gallons. *See* Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-Based Diesel Volume for 2017, 80 Fed. Reg. 77,420, 77,439 (Dec. 14, 2015). Then, EPA invoked another waiver provision—the so-called "inadequate domestic supply" provision—to reduce the volume by another 500 million gallons. *Id.* In doing so, EPA construed that provision to refer to the domestic supply of renewable fuel available to consumers for use in their vehicles. *Id.* at 77,436. In *ACE*, we rejected that interpretation of the inadequate domestic supply provision, holding that the provision "refers to the supply of renewable fuel available to refiners, blenders, and importers to

meet the statutory volume requirements." 864 F.3d at 709. "We therefore vacate[d] EPA's decision to reduce the total renewable fuel volume requirements for 2016 through use of the 'inadequate domestic supply' waiver provision and remand[ed] the Final Rule to the agency for further consideration in light of our decision." *Id.* at 713.

In the Final Rule, EPA determined that it would comply with the *ACE* remand and remedy the erroneous use of the inadequate domestic supply waiver by "restor[ing] the full 500 million gallons" incorrectly waived in the 2016 Rule. 87 Fed. Reg. at 39,603. Invoking its statutory authority to "ensure" that the volume requirements "are met," 42 U.S.C. § 7545(o)(3)(B)(i), EPA decided to impose two supplemental obligations of 250 million gallons each. The first—and the one at issue here—it established for 2022; the second it planned for later action in 2023. 87 Fed. Reg. at 39,629. The 250-million-gallon supplemental volume sits atop the 20.63-billion-gallon total standard, meaning that the total renewable fuel obligation for 2022 is effectively 20.87 billion gallons. *Id.* at 39,601.

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Using the waiver-adjusted and supplemental applicable volumes, EPA set the 2020, 2021, and 2022 percentage standards for total renewable fuel, advanced biofuel, and cellulosic biofuel. *Id.*

C.

Two sets of parties filed petitions for review challenging the Final Rule on various grounds. The first set of petitioners produce cellulosic biofuels, so we will refer to them as the Biofuel Petitioners. They contend that the cellulosic biofuel volumes are too low. The second set of petitioners are (or represent) fossil fuel refiners and retailers subject to the volume

requirements, so we will call them the Refiner Petitioners. They generally argue that the volumes are set at too high a level. Several other parties intervened, including a set of intervenors that are (or represent) fossil fuel refiners, whom we will call the Refiner Intervenors, and another set that are (or represent) renewable fuel producers, whom we will call the Renewable Intervenors.

We review the Final Rule under 42 U.S.C. § 7607(b)(1). Under that section, "[w]e may reverse the EPA's actions under the Program if we find them to be 'arbitrary, capricious, [or] an abuse of discretion.'" *AFPM*, 937 F.3d at 574 (quoting 42 U.S.C. § 7607(d)(9)(A)). "We will sustain the EPA's actions, however, so long as the agency 'consider[ed] all of the relevant factors and demonstrate[d] a reasonable connection between the facts on the record and the resulting policy choice.'" *Id.* (quoting *Sierra Club v. Costle*, 657 F.2d 298, 323 (D.C. Cir. 1981)). We "give an extreme degree of deference to the EPA's evaluation of scientific data within its technical expertise, especially where, as here, we review the EPA's administration of the complicated provisions of the Clean Air Act." *Id.* (internal quotation marks omitted). And "our review is particularly deferential in matters implicating predictive judgments." *Alon Refin.*, 936 F.3d at 663 (internal quotation marks omitted). "We also may reverse an EPA action under the Program if we determine that it is 'otherwise not in accordance with law' or 'in excess of statutory jurisdiction, authority, or limitations, or short of statutory right.'" *AFPM*, 937 F.3d at 574 (quoting 42 U.S.C. § 7607(d)(9)(A), (C)). We review EPA's interpretation of the Clean Air Act under the familiar two-step framework formulated in *Chevron, U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837 (1984). *See AFPM*, 937 F.3d at 574.

DISCUSSION

We start with the Biofuel Petitioners' challenges and then turn to the Refiner Petitioners' challenges.

A.

The Biofuel Petitioners challenge the cellulosic biofuel volumes. EPA set those volumes under the cellulosic waiver provision. 42 U.S.C. § 7545(o)(7)(D)(i). All parties agree that the waiver was triggered for the years 2020, 2021, and 2022 because "the projected volume of cellulosic biofuel production [was] less than the minimum applicable volume[s] established" in the statutory table. *Id.* The Biofuel Petitioners contend, however, that EPA misinterpreted or unreasonably applied the cellulosic waiver provision when lowering the cellulosic biofuel volumes to the "projected volume available" during each calendar year.

EPA construed the term "projected volume available during that calendar year" to refer to "the volume of qualifying cellulosic biofuel projected to be produced or imported and available for use as transportation fuel in the U.S. in that year." 87 Fed. Reg. at 39,615. In doing so, EPA did not include carryover cellulosic RINs, which represent the volume produced or imported the previous year but that remains available for compliance for that year. The Biofuel Petitioners contend that this was a mistake. In their view, EPA was required to include carryover cellulosic RINs in calculating the projected volume of available cellulosic biofuel. For 2020, for example, that would have added an additional 38 million gallons of cellulosic biofuel volume on top of the applicable volume of 510 million gallons. *See id.* at 39,616 n.95. Therefore, they argue, EPA set the cellulosic biofuel volume requirements too low.

We reject that challenge. As the Biofuel Petitioners concede, we review EPA's interpretation of the Program under *Chevron*. Biofuel Br. 18. *Chevron*, however, "does not apply where the statute is clear." *Garvey v. Admin. Rev. Bd.*, 56 F.4th 110, 121 (D.C. Cir. 2022) (quoting *Johnson v. Guzman Chavez*, 141 S. Ct. 2271, 2291 n.9 (2021)). Here, the statute clearly does not mandate the inclusion of carryover cellulosic RINs in calculating the "projected volume available."

We addressed, and rejected, a similar argument in *ACE*. There, as noted above, we construed another waiver authority, the so-called inadequate domestic supply provision. *ACE*, 864 F.3d at 713. The inadequate domestic supply provision authorizes EPA to reduce volume requirements "based on a determination . . . that there is an inadequate domestic supply." 42 U.S.C. § 7545(o)(7)(A)(ii). Like here, the petitioners there argued that, "[w]hen evaluating the available 'supply' of renewable fuel for purposes of the 'inadequate domestic supply' waiver provision," EPA must "consider carryover RINs as a supply source of renewable fuel." *ACE*, 864 F.3d at 714. We held that "the statute is better read not to require EPA to consider carryover RINs." *Id.* With respect to text, we observed that the waiver provision "does not reference carryover RINs as a source of supply of renewable fuel." *Id.* We also concluded that EPA's interpretation better comports with the statute's purpose. *Id.* The contrary approach, we said, would reduce the number of carryover RINs in the market to "almost zero." *Id.* at 715. "Without the flexibility and liquidity provided by carryover RINs, EPA reasoned that obligated parties facing unexpected shortfalls or increased demand for transportation fuel [might] be left with no way to comply with the statute." *Id.* We thus upheld this aspect of "EPA's interpretation of the 'inadequate domestic supply' waiver provision." *Id.*

ACE interpreted a different waiver provision, but its logic applies here. As in *ACE*, "[w]e look first to the text of the statute." *Id.* at 714. When triggered, the cellulosic waiver provision, like the inadequate-supply provision, contemplates a reduction in the renewable fuel requirements the statute specifies. In the case of the cellulosic waiver provision, EPA must "reduce the applicable volume of cellulosic biofuel" in the statutory table "to the projected volume available during that calendar year." *See* 42 U.S.C. § 7545(o)(7)(D)(i). A provision separate from either of the waiver authorities requires EPA to create a "credit program." *Id.* § 7545(o)(5) (capitalization altered). "Congress contemplated that an obligated party would be allowed to carry over credits from one year into the next: One of the credit program's provisions states that credits generated in the credit program 'shall be valid to show compliance for the 12 months as of the date of generation.'" *ACE*, 864 F.3d at 714 (quoting 42 U.S.C. § 7545(o)(5)(C)). "But nothing in the text of either [the waiver or the credit] provision indicates" that the projected volume of available cellulosic biofuel "must include any available 'carryover' credits from the prior year." *Id.*

The Biofuel Petitioners would have us infer a requirement to count carryover RINs as a source of available cellulosic biofuel from the statutory structure. They point out that the cellulosic waiver provision contains two relevant "volumetric terms." Biofuel Br. 21. First, to determine whether the waiver provision is triggered, EPA must calculate the "projected volume of cellulosic biofuel production." 42 U.S.C. § 7454(o)(7)(D)(i). Second, if the provision is triggered, EPA must reduce the statutory volume to the "projected volume available" for that calendar year. *Id.* These two terms, they insist, "cannot both mean the same thing." Biofuel Br. 21. In their view, the former refers to the "cellulosic biofuel projected to be *produced* during the year in question," whereas the latter

refers to the fuel "projected to be *available* to obligated parties for compliance during that year," which, they claim, includes the portion of the prior year's production that remains available for compliance in the current year in the form of carryover RINs. *Id.*

In fact, however, the text and structure of the provision foreclose the Biofuel Petitioners' reading. On their reading, the cellulosic waiver provision could require EPA to raise the applicable volume of cellulosic biofuel, despite the fact that the provision explicitly calls for a "reduc[tion]." 42 U.S.C. § 7545(o)(7)(D)(i). Consider the statutory volume for 2022: 16 billion gallons. *See Id.* § 7545(o)(2)(B)(i)(III). Suppose that EPA pegged "the projected volume of cellulosic biofuel production" at 15.9 billion gallons, all of which, let us assume, would be available for compliance purposes. And suppose that EPA projected that an additional 200 million gallons of carryover cellulosic RINs would be available for compliance for that year. Because the projected volume of production (15.9 billion gallons) "is less than" the statutory volume (16 billion gallons), EPA would be required to "reduce the applicable volume of cellulosic biofuel . . . to the projected volume available during that calendar year." *Id.* § 7545(o)(7)(D)(i). But, on the Biofuel Petitioners' reading, there would be 16.1 billion gallons of cellulosic biofuel available for compliance purposes—the 15.9 billion gallons produced that year plus the 200 million gallons produced the previous year but available in the form of carryover RINs. Thus, EPA would be required to somehow "reduce" the applicable volume from 16 billion gallons to 16.1 billion gallons.

The better reading of the statute avoids such absurd results. *See Ctr. for Biological Diversity v. EPA*, 722 F.3d 401, 411 (D.C. Cir. 2013). "When Congress uses the same word in

different parts of a statute, it usually means the same thing." *PDK Laby's Inc. v. DEA*, 362 F.3d 786, 796 (D.C. Cir. 2004). As the Refiner Intervenors suggest, the term "projected volume available" is best read as a subset of the "projected volume of . . . production." *See* Refiner Intervenors Br. 5-7. The term "available" thus operates as a modifier that narrows the relevant category of "projected volume" of cellulosic biofuel production, allowing EPA to account for situations where some portion of the projected volume of production may not be available to use for compliance. That may happen, for example, when cellulosic biofuel is produced in facilities that "sell the [fuel] they produce into non-transportation markets." *See* 80 Fed. Reg. at 77,506 n.217.

On this reading, the cellulosic waiver provision, when triggered, inevitably calls for a "reduc[tion]" in the applicable volume of cellulosic biofuel. Consider, again, the 2022 statutory volume of 16 billion gallons. If the "projected volume of . . . production" is 15.9 billion gallons, EPA will be required to reduce the statutory volume to the "projected volume available," which will necessarily be less than the statutory volume. 42 U.S.C. § 7545(o)(7)(D)(i).

In linking the "projected volume of . . . production" with the "projected volume available," we do not embrace a definitive interpretation of the former term. For present purposes, it is enough to conclude, as the Biofuel Petitioners concede, that the term "projected volume of . . . production" does not include volume reflected in carryover RINs. *See* Biofuel Br. 21 ("'[T]he projected volume of cellulosic biofuel production' refers to cellulosic biofuel projected to be produced during the year in question."). That conclusion makes good sense. The cellulosic waiver provision instructs EPA to calculate the "projected volume of . . . production" "based on the estimate provided under paragraph (3)(A),"

which refers to "an estimate . . . of the volumes of transportation fuel, biomass-based diesel, and cellulosic biofuel projected to be sold or introduced into commerce in the United States." *See* 42 U.S.C. § 7545(o)(3)(A). The estimate on which the "projected volume of . . . production" must be made, then, is an estimate of actual fuel use, not carryover RINs. It follows that the "projected volume available" also does not encompass carryover RINs. We leave for another day other questions regarding the scope of the "projected volume of . . . production," including, for example, whether the term may or must include imported cellulosic biofuel. *See* EPA Response to Comments (RTC) 45-46 (2022) (J.A. 485-86).

The exclusion of carryover RINs "makes eminent sense . . . when considered in light of the purposes of the Renewable Fuel Program statute." *ACE*, 864 F.3d at 714. The carryover RIN bank is of "critical importance . . . to the functioning of the renewable fuel market and to the ability of obligated parties to comply with their obligations." *Id.* It provides crucial "flexibility and liquidity." *Id.* at 715. Under the Biofuel Petitioners' reading, however, "the number of carryover RINs in the market would be reduced to almost zero." *Id.* Every time the cellulosic waiver provision is triggered, EPA would be required to set the applicable volume of cellulosic biofuel at a level that would systemically draw down or eliminate the bank of carryover cellulosic RINs. For good reason, we rejected a similar reading of the inadequate domestic supply waiver provision in *ACE*. *Id.* at 714-15.

To be sure, there are differences between the cellulosic waiver provision and the inadequate domestic supply provision at issue in *ACE*. As the Biofuel Petitioners point out, EPA must issue cellulosic waiver credits when it reduces the cellulosic volume requirements under the cellulosic waiver provision. *See* 42 U.S.C. § 7545(o)(7)(D)(ii). Contrary to the Biofuel

Petitioners' argument, however, the availability of cellulosic waiver credits does not negate the role of carryover cellulosic RINs. Rather, they work together to provide additional flexibility to obligated parties in satisfying the cellulosic biofuel requirements. Such flexibility is particularly sensible given the heightened uncertainty surrounding the production of cellulosic biofuel at the inception of the Program. Indeed, because "there was no commercial-scale production at all" for cellulosic biofuel at the time, the statutory volumes assumed "significant innovation in the industry." *Am. Petroleum*, 706 F.3d at 476.

For the foregoing reasons, we hold that the cellulosic waiver provision unambiguously excludes carryover cellulosic RINs from the "projected volume available." We reject the Biofuel Petitioners' various arbitrary and capricious challenges, which rely on the (mistaken) assumption that EPA selected from among a range of "permissible" interpretations. Biofuel Br. 31. And we therefore reject the Biofuel Petitioners' challenges to the cellulosic biofuel volumes for the years 2020, 2021, and 2022. Because we uphold the cellulosic biofuel volumes under the cellulosic waiver provision, we need not address whether—absent application of the cellulosic waiver provision—EPA could have or was required to set them at a higher level under the reset provision alone.

B.

We now address the Refiner Petitioners' challenges to the total renewable fuel and advanced biofuel volumes for 2022, the new formula for calculating the percentage standards, and the supplemental volume for 2022.

1.

The Refiner Petitioners challenge the 2022 total renewable fuel and advanced biofuel volumes. As mentioned, EPA set those volumes under both the cellulosic waiver provision and reset provision. The Refiner Petitioners challenge the volumes on four grounds. We address each in turn.

First, the Refiner Petitioners argue that, when it set them midway through that year, EPA "failed to adequately consider the retroactivity" of the 2022 applicable volumes. Refiner Br. 18. In their view, EPA should have set the 2022 applicable volumes based on year-to-date production levels, rather than try to induce the market to increase production levels during the remaining months of 2022. We have made clear, however, that EPA "may promulgate late renewable fuel requirements—and even apply those standards retroactively—so long as EPA reasonably considers and mitigates any hardship caused to obligated parties by reason of the lateness." *ACE*, 864 F.3d at 718. In assessing whether EPA has acted reasonably, we look to "whether obligated parties had adequate lead time and access to a sufficient number of RINs to comply with the delayed requirement." *Id.* (internal quotation marks omitted).

Here, EPA took sufficient care to minimize the hardship caused by its late issuance of the 2022 standards. EPA extended the compliance deadline, giving the obligated parties at least 11 months to comply with the renewable fuel requirements. 87 Fed. Reg. at 39,624. We have already held in *Wynnewood* that the new compliance deadline "is both reasonable and reasonably justified by the agency." 77 F.4th at 783. And the proposed rule, published in February 2020, gave "obligated parties . . . many months' notice of EPA's intent to issue [the] volume requirements." *ACE*, 864 F.3d at 771; *see also Wynnewood*, 77 F.4th at 783. EPA also

reasonably determined that the "market [was] capable of meeting the increased 2022 volumes through increased biofuel use" and that "any shortfall can be met by carryover RINs." 87 Fed. Reg. at 39,624.

The Refiner Petitioners do not dispute that they have access to enough RINs; instead, they complain that they may have to rely on imported fuel, more expensive biodiesel and renewable diesel, and carryover RINs to satisfy the standard. *See* Refiner Br. 18. This, they contend, will unreasonably drive up compliance costs and increase greenhouse gas emissions. *Id.* at 15, 17. But we "give EPA considerable discretion to weigh and balance the various factors required by statute," especially where, as here, the statute "does not state what weight should be accorded to the relevant factors." *Nat'l Wildlife Fed'n v. EPA*, 286 F.3d 554, 570 (D.C. Cir. 2002). EPA concluded that "[t]he advanced biofuel and total renewable fuel volumes strike a balance between numerous competing statutory factors." 87 Fed. Reg. at 39,623. That assessment was not arbitrary or capricious.

Second, the Refiner Petitioners argue that EPA arbitrarily and capriciously relied on the so-called "implied statutory targets" in setting the applicable volumes. Refiner Br. 14. As discussed, the implied statutory volume reflects the volumes of renewable fuels—such as conventional renewable fuel and non-cellulosic advanced biofuel—that an obligated party may, but need not, use to comply with the renewable fuel requirements. *See* 87 Fed. Reg. at 39,623 n.127. The concept is most readily understood by way of example. The 2022 statutory volume called for 36 billion gallons of total renewable fuel, 21 billion gallons of which were required to be advanced biofuel, resulting in an implied volume of 15 billion gallons of conventional renewable fuel. Likewise, of the 21 billion gallons of advanced biofuel, the statute required 16 billion

gallons to be cellulosic biofuel, implying that obligated parties may comply with the advanced biofuel requirement by using at least the requisite volume of cellulosic biofuel and at most five billion gallons of non-cellulosic advanced biofuel.

In setting the 2022 applicable volumes, EPA held constant these implied statutory targets, even as it lowered the overall applicable volumes. *See* 87 Fed. Reg. at 39,623. EPA lowered the total renewable fuel volume from 36 billion to 20.63 billion gallons; the advanced biofuel volume from 21 billion to 5.63 billion gallons; and the cellulosic biofuel volume from 16 billion to 0.63 billion gallons. Thus, the implied volumes—15 billion gallons of conventional renewable fuel and five billion gallons non-cellulosic advanced biofuel—remained the same. *See id.*

The Refiner Petitioners contend that was a mistake. In their view, the reset provision required EPA to "replace the statutory volumes with new applicable volumes," rendering the implied statutory volumes obsolete. Refiner Br. 14 (emphases omitted). Any reliance on those implied volumes, they insist, is arbitrary and capricious.

We disagree. EPA reasonably used the implied statutory volumes in setting the 2022 applicable volumes. The implied volumes are not binding. As EPA explained in response to a comment, "the implied volume requirement for conventional renewable fuel is not a requirement per se, but instead is only a description of that portion of the total volume requirement which is not required to be advanced biofuel." RTC at 119 (J.A. 495). Nothing in the cellulosic waiver provision or the reset provision limits EPA's discretion to retain the implied volumes for conventional renewable fuel and non-cellulosic advanced biofuel.

To the contrary, the cellulosic waiver provision—which EPA also invoked in setting the 2022 volumes—inevitably implies that compliance may be accomplished in part by reliance on other renewable fuels. As we have observed, "a reduction to the cellulosic biofuel volume requirement leaves a gap in the supply of advanced biofuel available to satisfy the advanced biofuel volume requirement." *ACE*, 864 F.3d at 731. The cellulosic waiver provision authorizes EPA to close that gap by subtracting from the total renewable fuel and advanced biofuel volumes the amount that would have been filled by the now-waived cellulosic biofuel volumes. Here, EPA exercised the cellulosic waiver provision when it determined that there would not be enough cellulosic biofuel production to meet the 16-billion-gallon statutory volume. It therefore reduced the applicable volume of cellulosic biofuel to the projected volume available during that calendar year. And, to close the resultant gap, it reduced the advanced biofuel and total renewable fuel volumes by the same amount. The reductions were based on updated projections of the availability of cellulosic biofuel; they had nothing to do with the availability (or lack thereof) of non-cellulosic advanced biofuel or conventional renewable fuel. So, EPA reasonably held those implied volumes constant. Because we hold that EPA reasonably declined to change the implied volumes, we need not address the Renewable Intervenors' argument that EPA lacked authority to do so.

Third, the Refiner Petitioners contend that EPA, apart from inadequately weighing environmental costs in balancing the reset factors, violated the Endangered Species Act. They make two arguments to fold this point into the Clean Air Act: First, they say the reset factors incorporate the ESA by referencing environmental impact; and second, the judicial-review provision of the Clean Air Act, in requiring us to reverse rules that are not "in accordance with law," 42 U.S.C. § 7607(d)(9)(A), sweeps in violations of the ESA. Neither

argument is properly before us: The first was not adequately developed before EPA, and the second was not adequately developed in the Refiner Petitioners' opening brief.

Fourth, the Refiner Petitioners argue that EPA failed to adequately explain how it balanced the statutory factors, and the partial dissent agrees. In particular, the Refiners fault EPA for crediting nonmonetized benefits over monetized costs. They point to a table in EPA's Regulatory Impact Analysis that identifies nearly 30 potential impacts—both costs and benefits—associated with the Final Rule. *See* RIA, at v (J.A. 151). EPA compiled the table "to provide additional information to the public regarding this rulemaking and to comply with [OMB] Circular A4," which provides guidance to agencies on conducting and reporting their regulatory analysis. RIA, at iv (J.A. 150). Most of the listed impacts in EPA's table are not monetized. For example, EPA places no specific dollar value on the benefit of increased employment attributable to increased renewable fuel production or the cost associated with higher food prices. *Id.* At the same time, EPA monetized two impacts, calculating that the Final Rule would generate $294 million in increased energy security and $7 billion in costs from higher fuel prices. EPA's failure to reconcile this "vast disparity" in costs over benefits, they argue, is arbitrary and capricious. Refiner Reply Br. 6.

This argument is flawed: It faults EPA for the fact that the statute Congress drafted is designed to yield benefits that it deemed important but understood are not easily monetizable. As the partial dissent recognizes, renewable fuels are generally more expensive than fossil fuels. Diss. Op. 3. (The partial dissent emphasizes EPA's projection that the 2022 standards will increase aggregate fuel costs for consumers by $5.72 billion. *See id.* at 1. For context, that cashes out at the pump in a one cent per gallon increase in the cost of E10, the most

common blend of transportation fuel sold in the United States. *See* RIA at 298 (J.A. 453)). If it were otherwise, the RFS Program would be largely superfluous; the market would independently incentivize the production and consumption of renewable fuels. Because renewable fuels are more expensive, however, "Congress adopted a 'market forcing policy' intended to 'overcome constraints in the market' by creating 'demand pressure to increase consumption' of renewable fuels." *ACE*, 864 F.3d at 710 (quoting 80 Fed. Reg. at 77,423). And that demand pressure comes with costs. In other words, in enacting the Renewable Fuel Standards Program, Congress made a policy choice to accept higher fuel prices in order to reap the benefits of "greater energy independence and . . . reduce[d] greenhouse gas emissions." *Id.* at 696. That those benefits are not easily monetizable does not mean they are less valuable. But it does mean that simply weighing the monetizable costs against the monetizable benefits—and thereby excluding the primary benefits for which Congress created the Program—will yield a misleading result.

EPA recognized as much in the Final Rule. The agency provided information on benefits and costs to comply with OMB Circular A-4. But, as we have elsewhere explained, "the Circular itself calls for a qualitative analysis" where "no quantified information on benefits, costs, and effectiveness can be produced." *Mozilla Corp. v. FCC*, 940 F.3d 1, 70 (D.C. Cir. 2019) (per curiam) (quoting OMB Circular A-4, at 10 (2003)). EPA found that it would be infeasible to monetize the benefits associated with reduced greenhouse gas emissions. RIA at 70 (J.A. 225). In such a situation, Circular A-4 explains, a quantitative cost-benefit analysis can "be misleading, because the calculation of new benefits . . . does not provide a full evaluation of all relevant benefits and costs." *Mozilla*, 940 F.3d at 71 (quoting OMB Circular A-4, at 10). For that reason, EPA conducted a qualitative analysis and concluded that "[t]he

advanced biofuel and total renewable fuel volumes strike a balance between numerous competing statutory factors." 87 Fed. Reg. at 39,623. In doing so, EPA reasonably identified benefits in the form of "the potential for growth in the volume of renewable fuel produced and consumed in the U.S., and the potential energy security and climate change benefits that producing and consuming increasing volumes of qualifying renewable fuels provide" as well as "the potential negative impacts of renewable fuels produced from crops such as corn or soybeans on environmental factors such as the conversion of wetlands, ecosystems, and wildlife habitat, water quality, and water supply." *Id.* at 39,623-24. And EPA likewise concluded that the benefits of the cellulosic biofuel volume—including climate-change related benefits—outweigh its predictable effect on fuel prices. *Id.* at 39,623

To the extent EPA could monetize the benefits associated with reduced greenhouse gas emissions, it supplies an array of calculations to help contextualize the Final Rule. EPA offered an "illustrative assessment" of benefits associated with reduced greenhouse gas emissions in light of various assumptions. RIA at 71 (J.A. 226). As EPA explained, reductions in greenhouse gas emissions can have a cascading beneficial impact on "changes in net agricultural productivity, human health effects, property damage from increased flood risk and natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services." *Id.* at 81 (J.A. 236). And because greenhouse gas "emissions today continue to impact society far out into the future," *id.* at 87 (J.A. 242), EPA explained, the results of such a cost-benefit analysis will depend in large part on how heavily we discount "costs that accrue to future generations," *id.* (J.A. 242). Notwithstanding these "limitations and uncertainties," *id.* (J.A. 242), EPA acknowledged the possibility that the 2022 standards could result in monetary benefits ranging from $1.95

billion to $25.84 billion, depending on the applicable discount rate, *see id.* at 93, Table 3.2.2.3.2-2 (J.A.248). To be sure, EPA acknowledged that the various uncertainties prevented the agency from relying on these figures in justifying the Final Rule. *See id.* at 71 (J.A. 226). Nevertheless, these illustrative benefits—as to which the Refiner Petitioners offer no objections—help to demonstrate the magnitude of the potential climate-change related benefits EPA associated with the Final Rule. It was not unreasonable for EPA to account for those potential benefits in setting the 2022 standards.

We therefore reject the Refiner Petitioners' challenges to the 2022 total renewable fuel and advanced biofuel volumes.

2.

Some of the Refiner Petitioners challenge EPA's new formula for calculating the annual percentage standards. *See* Refiner Br. 22 & n.8. As discussed, the old formula accounted for small refinery exemptions by excluding from the total transportation fuel introduced into the U.S. economy the amount of such fuel produced by small refineries that had received an exemption by the time the rule was promulgated. The new formula also excludes fuel produced by small refineries that are projected for but have yet to receive an exemption for the coming year.

To understand the difference, consider an example. Suppose the total transportation fuel projected for a given year is 100 billion gallons, and the required total renewable fuel is 10 billion gallons. The percentage standard would be ten percent (*i.e.*, 10 / 100). But suppose small refineries that already obtained exemptions are responsible for five billion gallons of transportation fuel, and that other small refineries projected to receive exemptions they have yet to obtain are responsible for another five billion gallons. Under the old

formula, the percentage standard would be 10.5 percent (*i.e.*, 10 / 95). Under the new formula, it would be 11.1 percent (*i.e.*, 10 / 90).

The Refiner Petitioners argue that EPA's new formula violates the statute. And even if it were statutorily permissible, they argue, EPA failed to justify the extent to which it departs from the old formula. We disagree. The statute does not confine EPA to the Refiner Petitioners' preferred method of accounting for small-refinery exemptions, and EPA's choice to account for them both retrospectively and prospectively is not arbitrary or capricious.

EPA locates its authority to account for the small refinery exemptions in the statutory language directing EPA to promulgate regulations to "ensure" that the applicable volumes "are met." *See* 87 Fed. Reg. at 39,632 (quoting 42 U.S.C. § 7545(o)(3)(B)(i)). The Refiner Petitioners do not question this authority. To the contrary, they concede that EPA may adjust the percentage standards to account for small refinery exemptions already granted at the time a rule is promulgated. *See* Refiner Br. 24. The only question, then, is whether the statute otherwise withholds from EPA the authority to account for such exemptions on a prospective basis.

The Refiner Petitioners point to two provisions, but neither imposes the claimed restriction. The first, 42 U.S.C. § 7545(o)(3)(C)(ii), requires EPA to reduce the requisite percentage standards to "account for the use of renewable fuel during the previous calendar year by small refineries that are exempt." The Refiner Petitioners argue that this provision confirms that exemptions must be granted "on a retrospective basis." Refiner Br. 24. We disagree. Section 7545(o)(3)(C)(ii) addresses a different issue; it and the new formula work to correct opposing distortions that result from small refinery

exemptions. Section 7545(o)(3)(C)(ii) prevents *overcompliance* by crediting any renewable fuel use by exempt small refineries toward meeting the overall national volume requirements. Returning to our example from above, if exempt small refineries nevertheless blended one hundred million gallons of renewable fuel, Section 7545(o)(3)(C)(ii) would appear to require EPA to subtract one hundred million gallons from the numerator in setting the following year's percentage standard. The percentage standard would go from 10 percent (10 / 100) to 9.9 percent (9.9 / 100). This difference—a tenth of one percent—represents the renewable fuel used by exempt small refineries that were under no obligation to do so. The new formula, on the other hand, helps prevent *undercompliance* by ensuring that the leeway afforded to small refineries does not lead to percentage standards that undershoot the target renewable fuel requirements. Given these competing aims, we conclude that Section 7545(o)(3)(C)(ii) has no bearing on whether or how EPA may account for the transportation fuel used by small refineries that are or will be exempted from their renewable fuel obligations.

The second provision the Refiner Petitioners cite, Section 7545(o)(3)(C)(i), requires EPA to adjust the percentage standards to avoid the imposition of "redundant obligations." The Refiner Petitioners contend that the new formula runs afoul of this provision because it could require obligated parties to produce more renewable fuel than would be necessary to satisfy the applicable volumes. Refiner Br. 25. The Refiner Petitioners are correct that, because it relies on an estimate of future exemptions, the new formula could lead to overcompliance. If EPA overestimates the number of small refinery exemptions it will grant, the percentage standard may lead to obligated parties producing excess renewable fuel. But the Refiner Petitioners are wrong that the new formula impermissibly results in redundant obligations. As the Refiner

Petitioners concede, "imprecision is inherent in the statute." Refiner Reply Br. 14-15. Overcompliance risks also occur, for example, whenever EPA estimates the national volume of transportation fuel that will be used that year. If EPA underestimates the national volume, the percentage standards will be set too high, causing obligated parties to produce more renewable fuel than necessary to satisfy the applicable volumes. EPA no more imposes "redundant obligations" by underestimating the total national volume of transportation fuel than it does by overestimating the total volume of small refinery exemptions. As with cellulosic biofuel projections, EPA must "take neutral aim at accuracy" when projecting the total of small refinery exemptions it will grant. *Am. Petroleum*, 706 F.3d at 477. An EPA projection that turns out to be off the mark does not retroactively violate Section 7545(o)(3)(C)(i). We therefore conclude that EPA has the statutory authority to account for small refinery exemptions on a prospective basis.

The Refiner Petitioners also argue that, even if the new formula complies with the statute, EPA failed to justify its departure from the old formula. They point out that, in defending the old formula, EPA had emphasized the difficulty of accurately projecting how many small refineries would receive exemptions. *See* Refiner Br. 28. Like any other agency, EPA may "depart from a prior policy position" so long as it "display[s] awareness that it is changing position." *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515 (2009) (emphasis omitted). In doing so, EPA "need not demonstrate to a court's satisfaction that the reasons for the new policy are better than the reasons for the old one; it suffices that the new policy is permissible under the statute, that there are good reasons for it, and that the agency believes it to be better, which the conscious change of course adequately indicates." *Id.*

EPA adequately justified its decision to adopt the new formula. In the Final Rule, EPA explained that it "believe[s] [it] can project the exempt small refinery volume with reasonable accuracy despite the uncertainties associated with this projection." 87 Fed. Reg. at 39,632. EPA first noted that the new formula required a projection of "only the aggregate exempted volume in a given compliance year," meaning it would not have to "wrestle with the difficulties" of predicting the outcomes of particular small refinery exemption applications. *Id.* In addition, EPA explained that, unlike in previous years, EPA had the "benefit of a stated policy for adjudicating [small refinery exemption] applications," a fact that, in its view, "strongly augment[ed]" its ability to make such projections. *Id.* EPA also emphasized that the stated policy would likely lead to the rejection of all small refinery exemption applications, *see id.* at 39,633, making such projections even easier. EPA developed that new policy in response to the Tenth Circuit's (now-vacated) decision in *Renewable Fuels Ass'n v. EPA*, 948 F.3d 1206 (10th Cir. 2020), *rev'd sub nom. HollyFrontier*, 141 S. Ct. 2172, and first invoked the policy as a basis for denying small refinery exemptions in April 2022. *See* 87 Fed. Reg. at 39,633 n.192. Whether that small refinery exemption policy is permissible is at issue in another set of pending petitions. *See Sinclair Wyoming Refin. Co. LLC. v. EPA*, No. 22-1073. No such challenge is presented here, and we take no position on its merits. But EPA had the authority to rely on that new exemption policy as a reason to abandon the old formula and adopt the new formula. Finally, EPA explained that it could make such projections because it had already decided many of the relevant applications, giving it a better sense of the total volume of exemptions it would grant. 87 Fed. Reg. at 39,633. Thus, EPA reasonably explained its adoption of the new formula.

In sum, EPA has the authority to adjust the percentage standards to account for small refinery exemptions; nothing in the statute limits EPA to making such adjustments on a retrospective basis; and EPA adequately justified its decision to also make such adjustments on a prospective basis. We therefore reject the Refiner Petitioners' challenges to the new formula.

3.

The last set of challenges relates to the 250-million-gallon supplemental volume EPA imposed in response to our remand in *ACE*. The Refiner Petitioners challenge the supplemental volume as both unlawful and arbitrary and capricious. We address each challenge in turn.

To start, we conclude that EPA had the statutory authority to impose the supplemental volume for 2022. To justify the volume, EPA invoked its power to "ensure" that applicable volumes "are met." 87 Fed. Reg. at 39,629 (citing 42 U.S.C. § 7545(o)(3)(B)(i)). The Refiner Petitioners object that EPA lacks authority to impose a 2022 volume to make up for the fact that the 2016 volume was too low. They argue that the statute does not provide a "true-up mechanism on the back end if things didn't go as planned." Refiner Br. 32. That argument is unpersuasive.

We have made clear that EPA must ensure the applicable volumes are met, "regardless of EPA delay." *Monroe Energy*, 750 F.3d at 920 (quoting *Nat'l Petrochem.*, 630 F.3d at 163). Therefore, EPA may increase later year volumes to make sure that volumes that should have been met in earlier years "are eventually sold or introduced into commerce." *Nat'l Petrochem.*, 630 F.3d at 157.

That is the lesson of *National Petrochemical and Refiners Association v. EPA*, 630 F.3d 145 (D.C. Cir. 2010). That case concerned the 2009 and 2010 applicable volumes of biomass-based diesel. *Id.* at 150. By statute, the applicable volume for 2009 was 0.5 billion gallons, while the volume for 2010 was 0.65 billion gallons. *Id.* (citing 42 U.S.C. § 7545(o)(2)(B)(i)(IV)). EPA missed the deadline to set the 2009 standards. *Id.* at 148 (citing 42 U.S.C. § 7545(o)(3)(B)(i)). To make up for the lost volume, EPA decided to "combin[e] the 2009 and 2010 biomass-based diesel statutory volume requirements to create one 2010 standard." *Id.* at 150. Therefore, the "obligated parties were required to use 1.15 billion gallons of biomass-based diesel based on the combined volume requirements for 2009/2010." *Id.* at 151. The petitioners challenged the 2009/2010 volume, arguing that "EPA lacked authority to increase the 2010 volume requirement to include the 2009 volume requirement." *Id.* at 152. We rejected that claim, holding that EPA's delay did not "preclud[e] EPA from ensuring that both the 2009 and 2010 applicable volumes of biomass-based diesel are eventually sold or introduced into commerce." *Id.* at 157.

The partial dissent's attempt to distinguish *National Petrochemical* falls short. It contends that the 2009 standards in that case, although promulgated late and consolidated with the 2010 standards, still "retained the compliance flexibilities of normal 2009 standards" since compliance could be met "with credits generated in 2008 or 2009." Diss. Op. 22. That is not quite right. Obligated parties could also use 2010 RINs to comply with their 2009 renewable fuel obligations. *See Nat'l Petrochem.*, 630 F.3d at 162. In addition, an obligated party could carry forward a portion of its 2010 obligations into 2011, meaning that it could functionally use 2011 RINs to satisfy its 2009 renewable obligations. *Id.* at 151 n.19. We say "functionally" because technically an obligated party was

permitted to carry forward only the portion of the 2009/2010 volume attributable to its 2010 obligations. *Id.* But that is still more compliance flexibility than afforded by the statutory carry-forward provision, which would have prohibited an obligated party that carried forward a 2009 deficit into 2010 to then carry forward a 2010 deficit into 2011. *See* 42 U.S.C. § 7545(o)(5)(D). In other words, under the rule we upheld in *National Petrochemical*, EPA authorized obligated parties to make up for volumes that should have been satisfied in 2009 through increased renewable fuel production in 2010 or even 2011. In approving a remedy allowing use of 2008, 2009, 2010, or 2011 RINs to comply with the 2009 standards, we sustained EPA's authority to impose supplemental standards to ensure that the applicable volumes of renewable fuels are eventually sold or introduced into commerce.

By the same token, EPA has the authority to impose a supplemental 2022 volume to make up for volume that should have been satisfied in 2016. EPA impermissibly waived 500 million gallons of renewable fuel from the 2016 applicable volume. *ACE*, 864 F.3d at 713. We therefore "vacate[d] EPA's decision to reduce the total renewable fuel volume requirements for 2016 through use of the 'inadequate domestic supply' waiver provision and remand[ed] the Final Rule to the agency for further consideration in light of our decision." *Id.* EPA missed the deadline to establish the appropriate 2016 volume but, under *National Petrochemical*, it has the statutory authority to "ensure" that obligated parties "eventually" sell or introduce that fuel into commerce. *Nat'l Petrochem.*, 630 F.3d at 157.

To be sure, the supplemental standard here was more delayed than the one at issue in *National Petrochemical*. It came six years after the relevant compliance period, rather than a single year. And EPA gave obligated parties more

compliance flexibility in that case than it did here: In *National Petrochemical*, EPA allowed obligated parties to use 2008/2009 RINs to comply with the supplemental 2010 standard, whereas in this case EPA did not permit them to use 2015/2016 RINs to comply with the 2022 supplemental standard. This, however, has no bearing on EPA's statutory authority to promulgate the standard. It goes, rather, to whether the standard is reasonable. To that end, the Refiner Petitioners contend that, even if EPA had authority to impose a supplemental volume, its decision to do so here was arbitrary and capricious. None of their various arguments is meritorious.

First, the Refiner Petitioners argue that EPA arbitrarily decides when it will and will not backfill missing volumes. Refiner Br. 32-33. They point out that EPA does not impose supplemental volumes to "correct the volume requirements based on deviations in [fuel] projections from the volumes actually consumed." Refiner Br. 32 (quoting RIA at 5 (J.A. 160)). For example, suppose that EPA sets the applicable volume of total renewable fuel at 10 billion gallons and projects 100 billion gallons of transportation fuel will be introduced into the market, yielding a percentage standard of 10 percent. If EPA's projection were too high, such that only 90 billion gallons of transportation fuel were in fact introduced into the market, then, pursuant to the percentage standard, only 9 billion gallons of renewable fuel would have been introduced into the market. In such a case, as EPA concedes, EPA would not implement a one-billion-gallon supplemental volume to account for that shortfall. *See* RIA at 5 (J.A. 160).

The two situations are materially different, however, making it reasonable for EPA to treat them differently. As discussed, EPA establishes the percentage standards by dividing the applicable volume for each renewable fuel type by an estimate of the national volume of transportation fuel that

will be used that year. The numerator represents the applicable volume required by the Program: the amount of renewable fuel EPA must "ensure" is "met." 42 U.S.C. § 7545(o)(3)(B)(i). The denominator is a factual forecast: the amount of transportation fuel "projected to be sold or introduced into commerce in the United States." *Id.* § 7545(o)(3)(A). EPA can thwart the Program by setting the numerator too low (*i.e.*, adopting an impermissibly low applicable volume) or by setting the denominator too high (*e.g.*, incorrectly forecasting total fuel usage). The former is a legal mistake, and, as occurred in *ACE*, it subjects the resulting percentage standard to vacatur. *See* 864 F.3d at 713. The latter is a technical error inherent in the nature of projecting events that have yet to occur. As EPA explained, the Program requires that EPA rely on such projections. RIA at 5 (J.A. 160). It is not arbitrary and capricious for EPA to treat a legal mistake differently from a prognostication error.

Second, the Refiner Petitioners contend that EPA, after initially suggesting that it would not impose a supplemental volume in response to the *ACE* remand, failed to explain its decision to change course. Refiner Br. 33-34. True, in a previous proposed rule EPA suggested it would not impose a supplemental volume in order to avoid taxing the carryover RIN bank. *See* 87 Fed. Reg. at 39,629. But EPA "recognize[d]" its change of position and explained that it no longer believed the supplemental volume would result in a drawdown of carryover RINs. *Id.* Specifically, EPA determined that the "market is capable of achieving the supplemental volumes with increased biofuel use." *Id.* Thus, EPA "display[ed] awareness that it is changing position" and offered a reasonable basis for doing so. *Fox*, 556 U.S. at 515.

Third, the Refiner Petitioners argue that EPA failed to consider other options to comply with the *ACE* remand.

Refiner Br. 36-39. To the contrary, EPA considered, for example, whether it could simply maintain the 2016 volume requirements and impose no supplemental volume. RTC at 151 (J.A. 527). EPA determined that approach would be inconsistent with its statutory mandate to "ensure," even if belatedly, that the applicable volumes are met. *Id.* EPA also considered whether to retroactively apply the discretionary component of the cellulosic waiver provision or the inadequate domestic supply waiver provision. *Id.* at 151-53 (J.A. 527-29). Invocation of those provisions is discretionary, and EPA's choice not to invoke them retroactively was not arbitrary and capricious. EPA thus "examine[d] the relevant data and articulate[d] a satisfactory explanation for its action including a rational connection between the facts found and the choice made." *Bluewater Network v. EPA*, 370 F.3d 1, 11 (D.C. Cir. 2004).

Fourth, the Refiner Petitioners contend that EPA imposed the supplemental volume without considering the relevant statutory criteria. Refiner Br. 35-36. That argument has it backwards. EPA's statutory obligation is to impose percentage standards to meet the statutorily prescribed volumes; it may reduce those volumes "only in limited circumstances." *Nat'l Petrochem.*, 630 F.3d at 149. The vacatur in *ACE* had the effect of re-imposing the 500-million-gallon volume requirement. That volume requirement had to be met unless lawfully waived. Contrary to what appears to be the Refiner Petitioners' view, EPA did not need to rely on some waiver provision—like the reset provision—to re-impose the 500 million gallons. In the Final Rule, EPA correctly recognized an obligation to impose a requirement to "ensure" that the prescribed volume was met. It had no obligation to consider the statutory factors as if it were devising a volume requirement anew.

Given that EPA was late in promulgating the supplemental volume, it had to "consider[] and mitigate[] any hardship caused to obligated parties by reason of the lateness." *ACE*, 864 F.3d at 718. We conclude that EPA did so. EPA recognized that the supplemental volume would present "significant challenges," especially in light of "market-forcing standards" already set for 2022. 87 Fed. Reg. at 39,629. Nevertheless, EPA concluded that "compliance with the 2022 supplemental standard in addition to the 2022 annual standards is feasible and can be achieved through the actual use of renewable fuels, including imports, in 2022 as opposed to carryover RINs." *Id.* at 39,628. Rather than require a single 500-million-gallon supplemental volume, EPA split the obligation "across two compliance years." *Id.* at 39,630. To the extent the obligated parties come up short, EPA determined the supplemental volume "could be met through a drawdown of the carryover RIN bank." *Id.* at 39,628. As discussed above, EPA provided at least 11 months of lead time, giving the obligated parties a reasonable period to comply with the obligation. *See id.* And EPA adopted various mechanisms to further "mitigate the compliance burden." *Id.* at 39,630. EPA concluded that the overall benefits of the supplemental volume outweigh the potential burdens. *Id.* That was a reasonable conclusion.

Finally, some Refiner Petitioners argue that EPA should have permitted obligated parties to satisfy the supplemental volume with 2015/2016 RINs. Refiner Br. 39 & n.12. To be sure, doing so would have been more consistent with the agency's approach in *National Petrochemical*, where obligated parties were permitted to use old RINs (from 2008 and 2009) alongside new RINs (from 2010) to meet the 2009 standards. But EPA considered that option and concluded that doing so would be "administratively impractical and highly burdensome," EPA Br. 74, since it would require rescinding

the 2016 standard, promulgating a new 2016 standard, returning the 2015/2016 RINs used for compliance to the original owners (some of whom may no longer exist), and requiring a new compliance demonstration, RTC at 153-54 (J.A. 529-30). EPA also explained that it would need to reopen compliance for all years from 2016 onward because the two-year lifespan of RINs means that returning RINs for one year creates "cascading impacts on each subsequent year's compliance." *Id.* EPA reasonably avoided that relatively complex set of adjustments by declining to permit obligated parties to satisfy the supplemental volumes with 2015/2016 RINs.

CONCLUSION

For these reasons, the petitions for review are denied.

So ordered.

KATSAS, *Circuit Judge*, concurring in part and dissenting in part: In 2022, the Environmental Protection Agency substantially increased the minimum volumes of renewable fuel that must be sold in the United States as transportation fuel. EPA estimated that these new standards would increase annual fuel costs for consumers by over $5.72 billion. "[T]hat's billion with a b." *White Stallion Energy Ctr., LLC v. EPA*, 748 F.3d 1222, 1259 (D.C. Cir. 2014) (Kavanaugh, J., concurring in part and dissenting in part), *rev'd sub nom. Michigan v. EPA*, 576 U.S. 743 (2015). The agency further estimated that the new standards would generate only $160 million in quantified annual benefits, all coming from increased energy security. One need hardly be an expert to see that the $5.72 billion in costs is strikingly larger than the $160 million in benefits—more than 35 times larger, to be precise.

So what justifies a rule for which costs so dramatically exceed benefits? The regulatory preamble says very little about this. For two kinds of renewable fuel, EPA merely stated the obvious—that the volume requirements strike a balance among competing statutory considerations, which include "potential" energy security and climate change benefits. *See* Renewable Fuel Standard (RFS) Program: RFS Annual Rules, 87 Fed. Reg. 39,600, 39,623–24 (July 1, 2022) (Final Rule). Yet in doing so, EPA did not even mention the most important competing consideration—the $5.72 billion annual increase in fuel costs. *See id.* For a third kind of renewable fuel, EPA acknowledged cost considerations but again stressed a "potential" offsetting climate benefit from reduced greenhouse-gas emissions. *See id.* at 39,623. Nonetheless, citing "uncertainty" about how the standards might affect those emissions, EPA refused to give any "quantified projection of the GHG emission impacts of the rule." *Id.* at 39,626 n.139.

A regulatory impact analysis elaborates on how EPA assessed the governing statutory considerations. Renewable Fuel Standard (RFS) Program: RFS Annual Rules, Regulatory

Impact Analysis (June 2022) (RIA). As to any possible climate benefit, EPA again hedged its bets: The RIA likewise declined to commit to any quantitative estimate, instead repeatedly stressing what EPA views as "considerable uncertainty" about how renewable fuels might affect greenhouse-gas emissions. *Id.* at 67, 71. The RIA did set forth what EPA described as an "illustrative" attempt to estimate climate benefits over the next three decades, but the agency expressly disclaimed reliance on it. *Id.* at 71 ("This illustrative scenario is not EPA's assessment of the likely greenhouse gas impacts of this rulemaking.").

To make matters worse, the 2022 standards imposed two distinct volume requirements for renewable fuel: a base and a supplement. The supplement seeks to cancel out a legal error that EPA made in setting the 2016 volume requirement too low. But the statute mandates volume requirements to be set, and compliance to be assessed, on a year-by-year basis; it provides no authority for EPA to transfer volume requirements from one year to another. EPA fixed the 2022 volume requirement—which it regarded as aggressive—based on its assessment of the statutory factors governing that inquiry. Then, it added an extra quarter-billion gallons to boot.

In my view, the 2022 volume requirements are arbitrarily high. According to EPA, their quantified annual costs exceed their quantified annual benefits by over $5.5 billion. And vague references to potential climate benefits over the course of decades, which EPA viewed as too uncertain even to estimate, do not make up the difference. Moreover, the supplement does not even purport to reflect application of the

governing legal standards. For these reasons, I would set aside the 2022 volume requirements.[1]

I

The Clean Air Act creates a Renewable Fuel Standard Program, which requires minimum volumes of renewable fuels to be sold in the United States as transportation fuel. 42 U.S.C. § 7545(*o*)(2)(A)(i). These fuels are produced from renewable biomass such as corn, soybeans, or landfill waste, and they replace traditional fossil fuels such as gasoline, diesel fuel, and natural gas. *Id.* § 7545(*o*)(1)(J). Renewable fuels are more expensive than traditional fuels. When burned, they emit less greenhouse gas. But the production of renewable fuels itself can generate significant emissions, from activities such as preparing land to grow the necessary feedstocks.

The statute addresses four types of biofuels—renewable fuel, advanced biofuel, cellulosic biofuel, and biomass-based diesel. The fuels vary according to their feedstocks and expected reduction in greenhouse-gas emissions. 42 U.S.C. § 7545(*o*)(1)(B), (D), (E), (J). Some of these categories are nested within others: Cellulosic biofuel and biomass-based diesel are specific types of advanced biofuel, which in turn is a specific type of renewable fuel. *See Ams. for Clean Energy v. EPA*, 864 F.3d 691, 697–98 (D.C. Cir. 2017) (*ACE*). For renewable fuel, advanced biofuel, and cellulosic biofuel, Congress set increasing annual minimum volumes in statutory tables running through 2022. 42 U.S.C. § 7545(*o*)(2)(B)(i)(I)–

[1] Like my colleagues, I would deny the petitions for review filed by the biofuel producers, who seek to make the volume requirements even higher. I further agree with my colleagues that, if the volume requirements are valid, EPA did not independently err in setting compliance standards based on those requirements.

(III). For later years, EPA itself must set annual minimum volumes based on six considerations. *Id.* § 7545(*o*)(2)(B)(ii). To ensure that these minimum volumes are in fact sold, EPA also must convert the volumes into percentage requirements imposed on obligated parties such as refiners and importers of transportation fuel. *Id.* § 7545(*o*)(3). Furthermore, EPA must administer a program for suppliers of renewable fuel to obtain tradeable credits valid for one year after they are generated. *Id.* § 7545(*o*)(5).

The statutory minimum volumes "provide only starting points." *Am. Fuel & Petrochemical Mfrs. v. EPA*, 937 F.3d 559, 569 (D.C. Cir. 2019) (*AFPM*). Several waiver provisions allow—and at times require—EPA to reduce the statutory minima. A general waiver provision permits the agency to reduce any minimum volume that would "severely harm the economy or environment" or that has proven infeasible because of an "inadequate domestic supply" of the relevant fuel. 42 U.S.C. § 7545(*o*)(7)(A). There is also a separate waiver provision keyed to shortages of cellulosic biofuel: In any year "for which the projected volume of cellulosic biofuel production" is less than the statutory minimum, EPA must reduce the statutory minimum to the projected available volume, and it may reduce the statutory minima for the broader categories of advanced biofuel and renewable fuel by up to the same amounts. *Id.* § 7545(*o*)(7)(D)(i).

A further provision, titled "Modification of applicable volumes" and known as the reset authority, kicks in if EPA has made large enough waivers in prior years. 42 U.S.C. § 7545(*o*)(7)(F). It applies to any statutory volume table for which the agency has waived either (i) at least 20 percent of statutory minima for two consecutive years or (ii) at least 50 percent of a statutory minimum for one year. *Id.* This reset authority requires EPA, within one year of issuing the

triggering waiver, to modify all minimum volumes for later years covered by the statutory table. *Id.* EPA could not exercise its reset authority until 2016, but waivers before 2016 could (and did) trigger a requirement for EPA to exercise its authority for years after 2016. *Id.*

In exercising its reset authority, EPA must use the same "processes, criteria, and standards" that it uses to set volume requirements for years not covered by the tables. 42 U.S.C. § 7545(*o*)(7)(F). Those criteria require EPA to set annual minimum volumes based on past implementation and six enumerated factors:

> (I) the impact of the production and use of renewable fuels on the environment, including on air quality, climate change, conversion of wetlands, ecosystems, wildlife habitat, water quality, and water supply;
>
> (II) the impact of renewable fuels on the energy security of the United States;
>
> (III) the expected annual rate of future commercial production of renewable fuels … ;
>
> (IV) the impact of renewable fuels on the infrastructure of the United States … ;
>
> (V) the impact of the use of renewable fuels on the cost to consumers of transportation fuel and on the cost to transport goods; and
>
> (VI) the impact of the use of renewable fuels on other factors, including job creation, the price and supply of agricultural commodities, rural economic development, and food prices.

Id. § 7545(*o*)(2)(B)(ii). Boiled down, paragraph (2)(B)(ii) requires EPA to set minimum volumes based on its analysis of (1) environmental impacts including climate change, (2) energy security, (3) production of renewable fuels, (4) infrastructure, (5) cost, and (6) other factors.

The waiver provisions have proven essential to the RFS program, for "[t]he statute was a bit optimistic, to put it generously." *ACE*, 864 F.3d at 726. Most notably, cellulosic biofuel has not been produced at even a fraction of what was expected. *See id.* And because cellulosic biofuel is a specific kind of advanced biofuel and renewable fuel, its failed development has dragged down those categories as well. *See AFPM*, 937 F.3d at 572. For years, EPA has addressed these shortfalls through the waiver provision for cellulosic biofuel, making significant reductions to the minimum volumes for cellulosic biofuel, advanced biofuel, and renewable fuel. These reductions have triggered EPA's reset authority for all three of the fuel categories, in 2010, 2015, and 2019 respectively. *See* Final Rule, 87 Fed. Reg. at 39,607. Yet until this rulemaking, EPA had never exercised its reset authority.

II

The Final Rule sets minimum volumes for 2020, 2021, and 2022; sets a second, supplemental volume for 2022; and calculates the applicable percentage requirements. *See* 87 Fed. Reg. at 39,610–35. As has been the case throughout the RFS program, the volume requirements were substantially lower than the statutory targets. Yet the 2022 volume requirements also were "significantly higher" than the those established by EPA for preceding years. *Id.* at 39,603; *see also id.* at 39,631

(table of volumes). A group of refiners challenge the 2022 volumes as unlawfully high.[2]

To justify setting volumes below the statutory baselines, EPA invoked both the reset provision and the waiver provision for cellulosic biofuel. Final Rule, 87 Fed. Reg. at 39,608. In explaining the volumes selected, EPA framed its analysis around "the statutory factors that the reset authority requires us to consider." *Id.* Yet it reduced the 2022 volumes to the exact levels that the cellulosic-waiver provision by itself would have required (for cellulosic biofuel) or permitted (for advanced biofuel and total renewable fuel). *See id.* at 39,623. EPA sought to explain these volumes in a regulatory preamble and in a separate regulatory impact analysis.

A

The preamble contains only a cursory discussion of how EPA balanced the statutory factors to set the 2022 volumes. For cellulosic biofuel, EPA recognized that the cellulosic-waiver provision required the agency to reduce the volume to the amount projected to be available. Final Rule, 87 Fed. Reg. at 39,623. EPA also recognized that the reset authority required it to consider further reductions. *Id.* Here is EPA's explanation for making no such reductions:

> EPA's approach to the cellulosic biofuel volume for 2022 seeks to realize the potential for GHG benefits associated with increased cellulosic biofuel production despite the relatively high costs of liquid cellulosic biofuels, and, in the case of [cellulosic fuels] derived from biogas, the impact on the price of transportation fuel. Because cellulosic biofuels

[2] Because the refiners do not challenge the 2020 or 2021 volumes, I do not consider whether they too are unlawfully high.

> through 2022 are projected to be produced from wastes or residues, their production is not expected to have significant adverse impacts on several of the statutory factors such as the price and supply of agricultural commodities, water quality and supply, and the conversion of wetlands, ecosystems, and wildlife habitat. Thus, while some of the statutory factors (such as the cost to consumers of transportation fuel and the cost to transport goods) may suggest that a volume of cellulosic biofuel lower than the volume projected to be produced in 2022 would be appropriate, we have determined that these factors are outweighed by other factors (such as climate change).

Id.

The preamble has a similarly terse justification for why EPA, in exercising its reset authority, made no further reduction to the 2022 volumes for advanced biofuel and total renewable fuel beyond what the cellulosic waiver allowed. Here is EPA's analysis of the governing statutory factors:

> The advanced biofuel and total renewable fuel volumes strike a balance between numerous competing statutory factors. They reflect the potential for growth in the volume of renewable fuel produced and consumed in the U.S., and the potential energy security and climate change benefits that producing and consuming increasing volumes of qualifying renewable fuels provide. They also take into consideration the potential negative impacts of renewable fuels produced from crops such as corn or soybeans on environmental factors such as the

> conversion of wetlands, ecosystems, and wildlife habitat, water quality, and water supply.

Final Rule, 87 Fed. Reg. at 39,623–24. EPA also expressed a desire to maintain "statutorily implied" volumes. *Id.* at 39,624. An implied volume is the difference between expressly required volumes for nested categories. For example, the implied volume for conventional renewable fuel is the required volume for all renewable fuel minus the required volume for advanced biofuel. Likewise, the implied volume for non-cellulosic advanced biofuel is the required volume for all advanced biofuel minus the required volume for cellulosic biofuel. EPA reasoned that maintaining these implied volumes would be "inherently consistent" with the statutory scheme. *Id.*

The preamble then sets forth "quantitative impacts" of the volume requirements. EPA found two such impacts: On the cost side of the ledger, the 2022 standards (including the supplement) would raise annual fuel costs to consumers by $5.72 billion relative to the 2020 standards. Final Rule, 87 Fed. Reg. at 39,626. On the benefit side, the 2022 standards would increase annual energy security by $160 million relative to the same baseline. RIA at 155.[3] As for climate benefits, EPA noted the "uncertainty related to the GHG emission impacts of this rule," and it therefore expressly declined to make any "quantified projection" of that variable. *Id.* at 39,626 n.139.

Finally, the preamble explained EPA's decision to impose a "supplemental" volume for 2022 to offset an unlawful reduction that EPA had made to an annual volume for 2016. In

[3] The preamble reports increased energy security for 2022 to be $227 million. Final Rule, 87 Fed. Reg. at 39,626. That figure appears to misstate the RIA, which calculated $227 million in energy security benefits from the 2021 and 2022 standards combined. RIA at 155. This discrepancy is immaterial to the analysis that follows.

ACE, this Court set aside EPA's use of the general waiver provision to reduce the 2016 requirement for total renewable fuel by 500 million gallons. *See* 864 F.3d at 702, 713. We held that EPA had impermissibly used that provision, which requires an inadequate domestic *supply* of the relevant fuel, to address *demand*-side constraints. *Id.* at 707. We vacated the waiver and "remand[ed] the rule to EPA for further consideration." *Id.* at 737.

In this rulemaking, EPA responded to *ACE* by (1) tacking on an extra 250 million gallons of renewable fuel to the volume requirement for 2022 and (2) promising to tack on the same amount to the volume requirement for 2023. Final Rule, 87 Fed. Reg. at 39,628. EPA rejected implementing *ACE* by reassessing compliance for 2016 or by reducing the outstanding 2016 volume through a retroactive exercise of the cellulosic-waiver provision. J.A. 528–30. Instead, EPA imposed what it described as a "supplemental standard" functioning "like a 2022 standard in all respects." Final Rule, 87 Fed. Reg. at 39,628. Yet in doing so, EPA excluded the supplement from its assessment of what volume of renewable fuel for 2022 would best comport with the paragraph (2)(B)(ii) factors. *Compare id.* at 39,623–25 (assessing factors) *with id.* at 39,627–31 (explaining supplement).

B

EPA supplemented the preamble with a regulatory impact analysis examining the factors governing its exercise of the reset authority. The RIA began by identifying 28 possible effects, organized around the six paragraph 2(B)(ii) factors. RIA at v. Almost all of these were costs as opposed to benefits, including increased annual fuel costs of $5.72 billion for 2022. *Id.* at v, 293–94. Other potential costs included harms to air quality from biofuel production, harms to wetlands and other

ecosystems from land-use change, harms to soil and water quality from feedstock production, aquifer depletion, "[u]se of limited water resources for irrigation instead of meeting human needs," higher corn and soybean prices, and higher food prices more generally. *Id.* at v. EPA quantified only one benefit: increased annual energy security of $160 million. *Id.* at v, 155. And it identified only four other potential benefits: reduced greenhouse-gas emissions, increased employment, increased economic development in rural areas, and increased supply of certain agricultural commodities. *Id.* at v.

For greenhouse-gas emissions, EPA did not commit to a quantified impact. In 2010, it had estimated the GHG emissions of different kinds of biofuel to determine which ones met the statutory definitions for each type of renewable fuel. RIA at 66. Later, it made some partial updates. *See id.* at 66 & nn. 130–34. But EPA did not rely on these figures to assess the effect of the volume requirements on GHG emissions. Instead, EPA repeatedly stressed that there was "considerable uncertainty regarding the GHG emission impacts of renewable fuel use," *id.* at 67, and it invoked that uncertainty as a reason for "not presenting modeled estimates of the GHG impacts of the combined volumes in this final rule," *id.* 70–71. EPA did say that its 2010 estimates remained "within ranges found in more recent studies," but it also noted that the studies reflect divergent views on the "lifecycle GHG emissions" of renewable fuels. *Id.* at 67 & n.139. The most recent study cited by EPA looked at the impact of the RFS program itself on GHG emissions. This study concluded that the emissions from land-use changes to implement the program were "enough to fully negate or even reverse any GHG advantages of the fuel relative to gasoline"—largely due to a net *increase* in lifecycle GHG emissions from corn-based ethanol. Lark et al., *Environmental Outcomes of the US Renewable Fuel Standard*, 119 Proceedings of the Nat'l Academy of Sciences No. 9,

e210184119 at 2 (Feb. 14, 2022). In the end, the most EPA was willing to say was that the volume requirements "*may* affect climate change by altering the amount" of GHG emissions. RIA at 65 (emphasis added).

EPA did provide an "illustrative analysis of GHG emissions." RIA 71. It estimated changed emissions attributable to the volume requirements over the next three decades. *Id.* at 78–80. Using three possible discount rates, EPA then estimated the social cost of carbon—measured in dollars per unit of carbon—over the same three decades. *Id.* at 86. Finally, it multiplied those figures to estimate the dollar values of the reduced carbon emissions over the same period. *Id.* at 92–94. But despite the complexity of this analysis, EPA expressly disavowed it. In the first paragraph of a 25-page discussion, the agency stated: "This illustrative scenario is not EPA's assessment of the likely greenhouse gas impacts of this rulemaking." *Id.* at 71.

III

A

The Clean Air Act requires us to reverse rules that are "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 42 U.S.C. § 7607(d)(9)(A). This language parrots the Administrative Procedure Act. *See* 5 U.S.C. § 706(2)(A). We therefore must consider whether EPA has given a "satisfactory explanation for its action." *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (cleaned up). Likewise, we must consider whether its decision "was based on a consideration of the relevant factors and whether there has been a clear error of judgment." *Id.* (cleaned up). And we must set aside the decision if the agency "entirely failed to consider an important aspect of the problem" or "offered an explanation for its

decision that runs counter to the evidence" before it. *Id.* Justice Kavanaugh has distilled these familiar principles into one overarching insight: Agency action must be "reasonable and reasonably explained." *FCC v. Prometheus Radio Project*, 141 S. Ct. 1150, 1158 (2021); *see also ACE*, 864 F.3d at 726.

B

The reset authority required EPA to consider six general factors in setting the minimum volumes for 2022. 42 U.S.C. § 7545(*o*)(2)(B)(ii), (*o*)(7)(F). EPA identified some 28 considerations bearing on these factors. RIA at v. It quantified two of them: According to EPA, the 2022 standards would increase annual fuel costs to consumers by $5.72 billion and would increase the Nation's annual energy security by only about $160 million. Final Rule, 87 Fed. Reg. at 39,626; RIA at 155, 294. In other words, the costs of the standards exceed their benefits by more than 35 times, and their net annual cost is over $5.5 billion—yes, with a *b*. Costs of this magnitude are an "important aspect of the problem" for EPA to consider, *State Farm*, 463 U.S. at 43, particularly because paragraph (2)(B)(ii) expressly requires it to analyze "cost to consumers of transportation fuel," 42 U.S.C. § 7545(*o*)(2)(B)(ii)(V). In setting aside another EPA rule promulgated with scant consideration of a ten-digit price tag, the Supreme Court explained: "Agencies have long treated cost as a centrally relevant factor when deciding whether to regulate. Consideration of cost reflects the understanding that reasonable regulation ordinarily requires paying attention to the advantages *and* the disadvantages of agency decisions." *Michigan v. EPA*, 576 U.S. 743, 752–53 (2015). The dissenters fully agreed. *See id.* at 769 (Kagan, J., dissenting) ("Cost is almost always a relevant—and usually, a highly important—factor in regulation. Unless Congress provides otherwise, …

an agency must take costs into account in some manner before imposing significant regulatory burdens.").

By this metric, EPA's justification of the 2022 volumes does not fare well. Start with its explanation for setting the cellulosic-biofuel volume at the full amount expected to be produced. EPA acknowledged that cost considerations cut in favor of a lower volume. Final Rule, 87 Fed. Reg. at 39,623; *see also id.* at 39,611 ("the cost of producing liquid cellulosic biofuel is high"). EPA then explained that because cellulosic biofuel is produced from waste rather than crops, various environmental harms from the production of crop-based renewable fuels ("such as the price and supply of agricultural commodities, water quality and supply, and the conversion of wetlands, ecosystems, and wildlife habitat") would not raise the price tag even more. *Id.* at 39,623. But what benefits cut in the other direction? Without elaboration, EPA named "other factors (such as climate change)" and noted a "potential for GHG benefits." *Id.* Yet as explained above, EPA declined to commit itself to any estimate of the reduced emissions attributable to the 2022 volumes, much less to any estimate monetizing those benefits. And assertions so "conclusory," regarding issues so critically important, do not count as a reasonable explanation. *Am. Clean Power Ass'n v. FERC*, 54 F.4th 722, 727 (D.C. Cir. 2022).

Next consider EPA's explanation for the advanced and renewable fuel volumes. EPA began with a truism—the volumes "strike a balance" (as any volumes would) among "competing statutory factors." Final Rule, 87 Fed. Reg. at 39,623. But in discussing these factors, EPA failed to mention increased fuel costs *at all*, much less acknowledge that it had estimated them to be several billion dollars annually. *See id.* at 39,623–24. Instead, the agency ticked off two potential benefits from the higher volumes—"energy security" (without

mentioning that it had estimated this benefit to be a paltry $160 million annually) and "climate change benefits" (without mentioning that it had declined to estimate reduced emissions or to monetize those benefits). *See id.* at 39,623. The only other considerations mentioned fell on the costs side of the ledger—the various environmental harms from crop-based renewable fuels "such as the conversion of wetlands, ecosystems, and wildlife habitat, water quality, and water supply." *Id.* at 39,624. Far from decreasing the $5.5 billion annual deficit of costs over benefits, those additional costs would have made it even higher.

Rather than engage with the paragraph (2)(B)(ii) factors, EPA asserted a different rationale for reducing the advanced and renewable volumes only as permitted by the cellulosic-waiver provision. The agency reasoned that maintaining "statutorily implied" volumes—of non-advanced renewable fuel and of non-cellulosic advanced biofuel—would be more "inherently consistent" with the statute. Final Rule, 87 Fed. Reg. at 39,624. But that reasoning is itself inconsistent with the statute. When there is a shortfall in production of cellulosic biofuel, the waiver provision requires EPA to reduce the cellulosic-biofuel volume to account for the shortfall and then permits the agency to reduce volumes for the broader categories of advanced biofuel and renewable fuel by no more than the same amount. 42 U.S.C. § 7545(*o*)(7)(D). But the cellulosic-waiver provision and the reset authority are different. The latter requires EPA, when statutory volume targets are missed by a sufficiently large amount, to consider broader changes based on its own assessment of the paragraph (2)(B)(ii) factors. *Id.* § 7545(*o*)(7)(F). And here, the reset provision was triggered many times over: EPA reduced the cellulosic-biofuel volume by 93.5 percent in 2010, and it has reduced that annual volume by similarly large percentages ever since. *See* Final Rule, 87 Fed. Reg. at 39,607 & n.30.

Likewise, the relevant waivers for advanced biofuel and renewable fuel easily exceeded the statutory trigger for the reset provision. *See id.* at 39,607. Because these wholesale reductions triggered the reset authority as to all three kinds of renewable fuel, EPA was required to come up with new volumes by reasonably balancing the paragraph (2)(B)(ii) factors, including increased fuel costs. It could not simply collapse that inquiry into the much narrower one governing the cellulosic-waiver provision.

EPA's reasoning as to implied volumes also fails for a different reason—it assumes that the only ongoing concern has been the chronic unavailability of cellulosic biofuel. EPA's own analysis indicates otherwise. According to EPA, use of conventional renewable fuel, which is overwhelmingly corn-based ethanol, has "virtually stagnated as the market reached the E10 blendwall." Final Rule, 87 Fed. Reg. at 39,612. This happened because almost all gasoline sold in the United States now contains at least ten percent ethanol (*i.e.*, is E10). RIA at 30. And most vehicle engines in the United States "were not designed to handle gasoline consisting of more than 10 percent ethanol." *Monroe Energy, LLC v. EPA*, 750 F.3d 909, 914 (D.C. Cir. 2014). So as the implied volume for conventional renewable fuel rose above the blendwall, and as cellulosic biofuel continued to be unavailable, the practical effect was to require obligated parties to replace diesel fuel with advanced biofuels at levels well above the volume requirements for that category. Final Rule, 87 Fed. Reg. at 39,612, 39,624. Because advanced biofuels are more expensive than corn-based ethanol, this dynamic drove the projected $5.72 billion increase in fuel costs—primarily through an 8.62 cent-per-gallon increase in the cost of diesel. RIA at 287–294. Yet despite laying all of this out, the agency did not consider any cost issues, much less these interrelated cost issues spanning all three nested categories, in setting the advanced and renewable fuel volumes.

On the benefits side of the analysis, it is of course true that qualitative benefits are sometimes as important as, or even more important than, quantified costs or benefits. *See Mozilla Corp. v. FCC*, 940 F.3d 1, 70–71 (D.C. Cir. 2019). But the larger the quantified net costs, the more significant and certain the qualitative benefits must be to tip the scales in the other direction. Here, EPA remained agnostic on the extent of any climate benefits from reduced GHG emissions. Because of what it viewed as "the uncertainty related to GHG emission impacts of th[e] rule," EPA declined to make any "quantified projection of the GHG emission impacts of the rule." Final Rule, 87 Fed. Reg. at 39,926 n.139. Moreover, it repeatedly stressed its view that there was "considerable uncertainty" about how the volume requirements would impact GHG emissions. RIA at 67, 71. EPA even cited a study arguing that the shift to some renewable fuels has led to a net *increase* in GHG emissions. *Id.* at 68 n.139 (Lark). So EPA's own expert judgment was that the impact of renewable fuels on GHG emissions is deeply uncertain. And all this uncertainty related to the amount of reduced GHG emissions—before even beginning to estimate the dollar value of those reduced volumes. In sum, it is unreasonable to impose many billions of dollars of annual costs when any offsetting benefit is—by EPA's own expert judgment—so uncertain.

What to make of EPA's "illustrative" analysis of GHG emissions? The short answer is that EPA firmly disavowed it: "This illustrative scenario is *not* EPA's assessment of the likely greenhouse gas impacts of this rulemaking." RIA at 71 (emphasis added). A longer answer, buried in the fine print, is that EPA had many good reasons for caution. *First*, the RIA explains that measuring the various "GHG emissions associated with an increase in biofuel use" is a source of "uncertainty," and "[e]stimating indirect categories of emissions—such as land-use change—is particularly

challenging." *Id.* at 68–69. *Second*, the illustration was based on dated studies that may have underestimated GHG emissions from such land-use change. *See id.* at 65–67. *Third*, the illustration assumes that renewable fuels will fully displace corresponding categories of fossil fuels. *Id.* at 72. Yet EPA noted reasons to think that increased use of renewable fuels in the United States will cause an increase in fossil-fuel consumption abroad. *Id.* at 72 n.153. *Fourth*, the illustration assumes that 30 years "is an appropriate timeframe for evaluating the lifecycle GHG emissions of renewable fuels." *Id.* at 70. But while EPA endorses this timeframe to determine which fuels satisfy the statutory definitions, it expressed only agnosticism on whether 30 years is anything close to appropriate for present purposes. *See id.* ("the application of a 30-year time period may or may not be the most appropriate analytical time period over which to evaluate the impact of a rule that covers only three years of volume requirements"). And for dominant, plant-based renewable fuels such as corn-based ethanol and soybean-based diesel, the illustration itself projects that the renewables do not so much as break even on GHG emissions until about seven to eleven years after the initial land-use changes. *Id.* at 79. *Fifth*, the illustration explains that attempts to monetize GHG emissions depend heavily on selecting an appropriate discount rate, which has been a source of substantial and ongoing disagreement. *See id.* at 81–85. For instance, the three discount rates used in the illustration for the 2022 standards, ranging from 2.5 to 5 percent, yield present values ranging from $1.9 billion to $13 billion in climate benefits. *Id.* at 93. *Sixth*, the illustration projects benefits attributable to the new standards over the course of three decades, *id.*, whereas the increased fuel costs calculated by EPA are for one year only, *id.* at 282–95. So, the illustration indicates that the climate benefit of the 2022 standards over three decades ($8.40 billion, using the intermediate three percent discount rate) only modestly

exceeds the $5.72 billion cost for 2022 alone. This would be a much closer case if EPA had endorsed the illustration and then given some account of why avoiding worst-case, decades-long scenarios on climate change justifies ten-digit annual costs. But here, EPA affirmatively disclaimed what seems to be a highly contestable illustration, leaving no reasonable account of why inflicting such costs was warranted.

Finally, EPA cited no other benefits that could reasonably support the 2022 volume requirements. Of the 28 considerations around which the RIA was organized, only five involved potential benefits. I have already addressed the two principal ones—increased energy security and possibly lower GHG emissions. The other three are increased employment, rural economic development, and increased supply of agricultural commodities. RIA at v. But EPA acknowledged that any increased employment for biofuel production and agriculture may be offset by decreased employment in other sectors, and it did not "estimate the net employment effects." *Id.* at 223. For ethanol, EPA predicted only "economic restoration" from a return to pre-pandemic levels of consumption. *Id.* at 229. For cellulosic biofuel, it predicted increased economic activity of only $76 million in 2022. *Id.* And EPA was unable to estimate the "potential impact" of increased agricultural commodities. *Id.* It did suggest that the RFS program likely caused an increase in soybean oil production, but it concluded that "the primary driver for growth over the past 15 years in soybean production and planted acres has clearly been rising exports." *Id.* at 231–32. The small magnitude of these various secondary effects is not surprising, for the Clean Air Act is not primarily a jobs bill or a farm bill. These considerations do not substantially mitigate the multi-billion-dollar annual deficit of costs over benefits, and EPA could not reasonably conclude otherwise.

In defense of the 2022 volumes, my colleagues attribute to Congress "a policy choice to accept higher fuel prices in order to reap the benefits" of greater energy independence and reduced GHG emissions. *Ante* at 28. But the RFS statute is more nuanced than that. As explained above, it contains waiver provisions to account for economic and feasibility constraints in any given year. And paragraph (2)(B)(ii), which governs the reset question at issue here as well as volumes for all years after 2022, does not simply instruct EPA to prioritize energy security and reduced emissions above all else. To the contrary, it requires EPA to consider both those potential benefits and various costs, specifically including increased fuel costs to consumers. The RFS statute is thus quite unlike statutes requiring protection no matter the cost. *See, e.g.*, *TVA v. Hill*, 437 U.S. 153, 172–73 (1978). And it is much like the Clean Air Act provision at issue in *Michigan v. EPA*—except that here, the requirement to consider costs is express rather than implied. To render a non-arbitrary decision, EPA thus had to reasonably explain why benefits so uncertain outweigh costs so substantial, not merely to assert that conclusion.

IV

The supplemental volume suffers from a further defect—it is not authorized by statute. As explained above, EPA must consider the paragraph (2)(B)(ii) factors in exercising its reset authority. EPA applied those factors to set a 2022 requirement of 20.63 billion gallons of total renewable fuel. Final Rule, 87 Fed. Reg. at 39,601–03. EPA recognized that this amount was aggressive: The agency described it as "significantly higher" than the 202l requirement of 18.84 billion gallons, *id.* at 39,603; as "market-forcing," *id.* at 39,628; and as reflecting an "implied conventional renewable fuel volume" that exceeded the amount of conventional renewable fuel expected to be consumed, *id.* at 39,624. But despite pushing the outer limits

in setting this base volume requirement for 2022, EPA then tacked on a "supplemental" requirement, not because the paragraph (2)(B)(ii) factors supported it, but to "restore" half of the volumes that EPA had impermissibly waived in 2016. *See id.* at 39,629.

In support of its claimed authority to shift 2016 volume requirements to 2022, EPA invokes paragraph (3) of the RFS statute, which requires the agency to promulgate applicable percentages that "ensure[]" the volume requirements are met. 87 Fed. Reg. at 39,629–30; *see* 42 U.S.C. § 7545(*o*)(3)(B)(i). EPA overlooks a critical feature of this duty—it is specific to individual calendar years. Paragraph (3) provides that, by November 30 of each "calendar year[]" between 2005 and 2021, EPA must "determine and publish in the Federal Register, *with respect to the following calendar year*, the renewable fuel obligation that ensures that the [volume] requirements of paragraph (2) are met." 42 U.S.C. § 7545(*o*)(3)(B)(i) (emphasis added). So, EPA had one duty to ensure that 2016 volume requirements were met by 2016 obligated parties in 2016 and another duty to ensure that 2022 volume requirements were met by 2022 obligated parties in 2022. Under this scheme, EPA could not shift statutory volumes from one year to another.

Broader statutory structure confirms this point. Paragraph (2) prospectively establishes varying applicable volumes for each calendar year between 2006 and 2022. 42 U.S.C. § 7545(*o*)(2)(B)(i). It then requires EPA to establish applicable volumes "for calendar years after the calendar years specified in the tables" and to do so fourteen months in advance. *Id.* § 7545(*o*)(2)(B)(ii). Paragraph (7) establishes waiver and reset authorities that operate yearly on these applicable volumes. *Id.* § 7545(*o*)(7)(A), (D), (E), (F). As noted above, paragraph (3) requires EPA to establish applicable percentages prospectively,

"with respect to the following calendar year." *Id.* § 7545(*o*)(3)(B)(i). And paragraph (5) requires EPA to establish a program of tradeable credits "valid to show compliance" for one year from the date of generation. *Id.* § 7545(*o*)(5)(A), (C). So compliance—like the underlying volume and percentage requirements—operates on a yearly basis. And the annual waivers and credits ensure that obligated parties are never stretched beyond reason. Allowing EPA to shift volume requirements from one calendar year to another—to foreclose otherwise available waivers or the use of otherwise available credits—would upend this balanced scheme.

EPA also relies on decisions upholding the promulgation of untimely and even retroactive volume requirements, so long as the agency "reasonably considers and mitigates any hardship caused to obligated parties by reason of the lateness." *ACE*, 864 F.3d at 718; *see also Monroe Energy*, 750 F.3d at 919–21; *Nat'l Petrochemical & Refiners Ass'n v. EPA*, 630 F.3d 145, 153–64 (D.C. Cir. 2010). But in these cases, the late or retroactive standards operated on the calendar year at issue, together with the waiver authorities, compliance obligations, and tradeable credits for the same year. For example, in *National Petrochemical*, this Court upheld "combined volume requirements" for 2009 and 2010 that were imposed in a single, partially retroactive rule promulgated in February 2010. *See* 630 F.3d at 151. Critically, the 2009 component of this requirement retained the compliance flexibilities of normal 2009 standards, as refiners and importers could satisfy their obligations with credits generated in 2008 or 2009. *See id.* Indeed, as my colleagues note, the combined standard gave obligated parties even *more* flexibility than would otherwise be the case, to the extent that EPA allowed obligated parties to use 2011 credits to satisfy 2009 obligations. *Ante* at 36–37. Neither *National Petrochemical* nor its progeny involved the promulgation of supplemental volumes for a later compliance

year to make up for EPA's failure to promulgate volumes in an earlier one. And none of those cases involved the elimination of waivers and tradeable credits otherwise available in the year from which the volumes were shifted away. These cases do not support EPA's volume-shifting gambit.

EPA further reasons that it had to respond to *ACE* somehow, and reopening compliance for 2016 would have been impractical. Final Rule, 87 Fed. Reg. at 39,628. But if that were true, then EPA may have simply been unable to cure its 2016 mistake some six years later—a possibility the agency itself acknowledged in its notice of proposed rulemaking, *see id.* at 39,630. In *ACE*, we remanded "the rule"—*i.e.*, the rule through which EPA had established applicable volumes and percentages for 2016—for further consideration in light of our holding that the agency had unlawfully invoked the general waiver provision to lower the 2016 volumes. *See* 864 F.3d at 737. We did not, and could not, require EPA to act contrary to the statute, including by shifting the disputed volume six and seven years into the future.

Finally, the supplemental volume would be arbitrary even if EPA did have statutory authority to shift volumes from one year to another. The Final Rule was promulgated on July 1, 2022—years after EPA's statutory deadlines for exercising the reset authority based on triggering waivers in 2010, 2015, and 2019, *see* 42 U.S.C. § 7545(*o*)(7)(F); Final Rule, 87 Fed. Reg. at 39,607, and eight months after its deadlines for exercising the cellulosic waiver and setting the applicable percentages for 2022, *see* 42 U.S.C. § 7545(*o*)(3)(B)(i), (7)(D)(i). EPA also noted that it imposed the supplemental volume "significantly after" the November 2015 deadline for setting applicable volumes and percentages for 2016, *see* Final Rule, 87 Fed. Reg. at 39,630, though the significance of that observation is unclear if we credit EPA's assertion that it is "treating the supplemental

standard like a 2022 standard in all respects," rather than "as a supplement to standards for 2016," *see id.* at 39,628. Whatever the relevant deadline, EPA missed it, triggering what the agency acknowledged was an obligation to "mitigate hardship" caused by "late issuance of this standard." *Id.*at 39,630.

EPA did far less than it reasonably could have to mitigate the hardship. Among other things, it could have eliminated most of the outstanding 2016 volume through a retroactive application of the cellulosic-waiver provision. For 2016 volumes, EPA had invoked that provision to reduce the cellulosic-biofuel volume by 4.02 billion gallons, which gave it discretion to reduce the total renewable fuel volume by the same amount. But EPA reduced the latter volume by only 3.64 billion gallons—some 380 million fewer gallons than it could have. J.A. 737 & n.102. And *ACE* itself, despite holding that EPA could not invoke the general-waiver provision to reduce volumes based on "demand-side constraints," further held that EPA could invoke the discretionary component of the cellulosic-biofuel waiver to address that very consideration. 864 F.3d at 732–33. So, as to 380 million of the presently disputed 500 million gallons, EPA in 2016 simply invoked the wrong waiver provision.

EPA gave two reasons for not retroactively applying the cellulosic waiver to reduce the outstanding 2016 volume by 380 million gallons. First, it found that the supplemental standard was "achievable" in 2022. 87 Fed. Reg. at 39,630–31. But the relevant question is not one of feasibility; rather, it is whether EPA reasonably "mitigate[d] any hardship caused to obligated parties by reason of its lateness." *ACE*, 864 F.3d at 718–19. Applying a waiver theory that we specifically blessed in *ACE* surely counts as reasonable mitigation. Second, EPA thought it inappropriate to consider 2016 market conditions in assessing what it called a 2022 volume. J.A. 528.

But as shown above, RFS volumes and waivers operate together, on a calendar-year basis. And for 2016, EPA's biggest mistake was simply invoking the wrong waiver. In sum, even if the supplemental volume for 2022 were authorized by statute, it would still be arbitrary.

V

EPA has not reasonably explained any of the challenged 2022 volume requirements, and the supplemental requirement is also contrary to law. I would therefore set them aside. As my colleagues conclude otherwise, I respectfully dissent.