ORAL ARGUMENT NOT YET SCHEDULED

No. 22-1080

Consolidated with Nos. 22-1144 and 1145

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

NATURAL RESOURCES DEFENSE COUNCIL,

Petitioner,

v.

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION, et al.,

Respondents.

On Petition for Review
of Action of the National Highway Traffic Safety Administration

PROOF REPLY BRIEF OF PETITIONER NATURAL RESOURCES DEFENSE COUNCIL

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CAFE	Corporate Average Fuel Economy
NHTSA	National Highway Traffic Safety Administration
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INTRODUCTION

The Energy Policy and Conservation Act directs NHTSA to identify the *maximum* fuel economy gains automakers can make. The agency failed to do so for light trucks, because it made a sweeping, counterfactual assumption that no pickup truck whatsoever can use a certain type of fuel-efficient engine, called a high-compression-ratio Atkinson-enabled engine.[1] The consequences are apparent: millions of less efficient vehicles will hit the road, costing consumers in higher fuel outlays and dirtier air. Indeed, NHTSA does not dispute that if it erred here, the error was material.

And err NHTSA did. As an initial matter, the agency's response brief presents post hoc rationalizations for NHTSA's action that the Court should not credit. Petitioner Natural Resources Defense Council's (NRDC) opening brief addressed the rationale NHTSA offered in the Final Rule: that high-compression-ratio Atkinson-enabled engines cannot be used in pickups, because the type and frequency of driving that pickups do (i.e., their "duty cycle") would negate the benefits of the

[1] This type of engine switches automatically between a higher-efficiency "Atkinson" mode (for daily driving) and a power mode (for infrequent tasks like towing). NRDC-Br. 19–20.

technology. 87 Fed. Reg. 25,710, 25,789 (May 2, 2022). NRDC showed that pickups primarily drive at lower-load conditions where this technology is most effective, and that these engines are already used in the best-selling Toyota Tacoma pickup. NRDC-Br. 29–30, 37. As explained in this Reply, the agency's brief shifted to a new argument, asserting that these engines need a minimum "compression ratio"[2] of 13:1 to see incremental efficiency gains, but at that ratio they cannot generate enough torque[3] for pickups' heaviest tasks without unacceptably "knocking."[4]

Both the agency's original rationale and its new litigation rationale are arbitrary and capricious for the same reason: they are contradicted by the facts in the record. The fact is that Atkinson-enabled engines with compression ratios of 13:1 are *already in use* and working just fine where NHTSA supposes they cannot. Powerful sport utility vehicles

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[2] An engine's "compression ratio" is the ratio of cylinder volume with the piston at the bottom to the volume with the piston at the top.

[3] Torque is a measure of force. NRDC-Br. 22 n.7. Roughly, torque is an indicator of towing power.

[4] Knock is the premature ignition of the air/fuel mixture in an engine cylinder, i.e., before the spark plug fires. Knock can result in unsteady operation and damage to the engine over time. NHTSA-Br. 90.

(such as the Telluride and Palisade) use 13:1 ratio Atkinson-enabled engines and have the same or better torque capabilities as many pickups. The agency's post hoc litigation position is obviously wrong.

NHTSA nowhere explains how these engines can function in powerful sport utility vehicles, but cannot function in *less* powerful pickups. The agency makes the usual request for deference to its "engineering judgment." But no data, study, or empirical example supports the agency's sweeping assumption. In fact, the record contradicts it.

SUMMARY OF ARGUMENT

1. The agency's assumption that no pickup can use a high-compression-ratio Atkinson-enabled engine is arbitrary and capricious. For the first time, the agency's brief identifies a specific compression ratio (13:1) that it claims is necessary for these engines to produce incremental efficiency gains. At this newly-announced threshold, the agency says, these engines cannot deliver any pickup's advertised torque without knocking.

First, the Court cannot affirm NHTSA's action on this post hoc rationale. *Standing Rock Sioux Tribe v. U.S. Army Corps of Engineers*,

985 F.3d 1032, 1048 (D.C. Cir. 2021). *Second*, even if the agency's rationale were not post hoc, it runs counter to the record. Heavy sport utility vehicles—vehicles with more torque than many pickups—already use 13:1 ratio Atkinson-enabled engines without knocking problems. NHTSA nowhere explains why the supposed knocking problem would only occur in pickups, and not in other vehicles using similar engines and rated for similar torque. Its action was thus arbitrary. *See NRDC v. Herrington*, 768 F.2d 1355, 1396–98 (D.C. Cir. 1985).

2. NHTSA's second assumption—that sport utility vehicles using the same less-efficient engine as a pickup (so-called "engine-sharing") cannot be upgraded to high-compression-ratio Atkinson-enabled engines—is also arbitrary and capricious. In the Final Rule, NHTSA claimed "the duty cycle for these heavy vehicles" ruled out the use of Atkinson-enabled engines. 87 Fed. Reg. at 25,789. In its brief, however, the agency no longer points to the vehicles' "duty cycle." Instead, the brief presses (another) post hoc rationale, positing that it is too expensive for automakers to upgrade these sport utility vehicles with Atkinson-enabled engines.

Once again, the court cannot uphold the Final Rule on a post hoc rationale. Regardless, no record facts support the agency's claim. NHTSA fails to address, for example, that many sport utility vehicles are sold with multiple engine options. In other words, automakers *already* offer these vehicles with non-pickup engines, leaving NHTSA with no support for a conclusion that it would be uneconomic to put different engines in sport utility vehicles and pickups.

3. NRDC also challenges NHTSA's exclusion of another group of vehicles from consideration for upgrades to high-compression-ratio Atkinson-enabled engines—namely half a million primarily General Motors vehicles. Contrary to the agency's claim, this challenge was presented during the rulemaking. NHTSA proposed criteria that would exclude a vehicle from consideration for an upgrade to a high-compression-ratio engine, and then applied them in its modeling across the entire vehicle fleet. Commenters argued none of the criteria were valid as applied to any vehicle—i.e., that the model should consider Atkinson upgrades for *every* vehicle. The agency must now defend the exclusions it made pursuant to the challenged criteria. On the merits, NHTSA's exclusion of these vehicles is not supported by the record.

ARGUMENT

I. The Agency's "Pickup Truck Exclusion" Is Arbitrary and Capricious

The agency's core litigation claim is that high-compression-ratio Atkinson-enabled engines are "incapable" of meeting "the capabilities for which [pickups are] marketed and sold." NHTSA-Br. 111. This is because—the agency says for the first time in its brief—a high-compression-ratio engine requires a ratio of at least 13:1 to achieve efficiency gains, but a 13:1 engine cannot meet any pickup's advertised torque rating without unacceptable knocking. NHTSA-Br. 107–112.

This bright-line 13:1 threshold was nowhere in the Final Rule. It is an impermissible post hoc rationalization. Regardless, the threshold itself is contrary to the record and arbitrary on its own terms.

A. NHTSA's 13:1 threshold is a post hoc rationalization

The Final Rule never said high-compression-ratio engines require a compression ratio of 13:1 to be more efficient than existing engines. The agency's brief suggests this crucial threshold was "clear," because the record purportedly reflects that "high" means 13:1 and up. NHTSA-Br. 107–108. The point, apparently, is to establish that pickups like the Tacoma—which use Atkinson-enabled engines with an 11.8:1

compression ratio—do not use *high*-compression-ratio technology. This definitional gambit is misleading and a post hoc rationalization.

As an initial matter, NHTSA admits it has consistently used the term high-compression-ratio (HCR) engine "interchangeably" with Atkinson-enabled engine. NHTSA-Br. 108 n.24. Indeed, the Final Rule specifically says the Tacoma has an "HCR-based engine." 87 Fed. Reg. at 25,790. The agency's brief now insists that despite consistent interchangeable usage, "high-compression-ratio" and "Atkinson-enabled" were never synonyms.

Nothing in the record supports NHTSA's about-face. The brief's only citation for its "high means 13:1" proposition is a single paragraph from a 1,200-page report NHTSA co-authored in 2016. NHTSA-Br. 93. That paragraph does *not* say 13:1 is the minimum compression ratio for efficient high-compression operation—it says only that 13:1 is a "substantial increase" above a 10:1 ratio. NHTSA omits the preceding paragraph, which also describes 12.5:1 as a "substantial increase." The report in fact describes a 13:1 ratio as "*very* high."[5] And, as explained

[5] JA__[EPA, *Draft Technical Assessment Report* 5-8, 5-9, 5-33 (July 2016)] (emphasis added).

infra Section I.B.1, both co-authors of this report—the Environmental Protection Agency (EPA) and California's Air Resources Board—have concluded that many pickups *can* use 13:1 Atkinson-enabled engines.

This is not the only aspect of the agency's litigation rationale that is new. The overall efficiency gain from an Atkinson-enabled engine depends on a pickup's "duty cycle"—the fraction of the time a pickup is used simply to carry passengers vs. higher-load operations like towing.[6] The Final Rule contended that a pickup's duty cycle forces the engine to spend most of its time in high-power mode, negating the efficiency benefit of Atkinson technology. 87 Fed. Reg. at 25,786, 25,789. NHTSA said that conclusion was "based on" confidential information. *Id.* at n.233.

NRDC's opening brief showed that this assumption is wrong. NRDC-Br. 32–33. By far, most pickups are used primarily to carry passengers and light loads and are used for towing only infrequently. This means they operate at lower-load conditions far more often,

[6] The agency's brief implies that "duty cycle" commonly refers to a vehicle's maximum capability. NHTSA-Br. 110. That is wrong. Duty cycles measure how much time a vehicle spends under various conditions. *See* Nat'l Renewable Energy Lab'y, *Duty Cycle Analysis* (Oct. 28, 2009), https://www.nrel.gov/docs/fy10osti/46972.pdf.

making the advantage from an Atkinson-enabled engine all the more apparent. NRDC-Br. 41.

But the agency's brief now claims NHTSA "did not need to examine or address" how pickups are regularly *used*, just how they are "marketed." NHTSA-Br. 110–111. And the brief says NHTSA did *not* rely on confidential data as claimed in the Final Rule, but rather on (unspecified) public data. NHTSA-Br. 114 n.25.

In short, the agency's 13:1 threshold is a post hoc rationalization. This Court should not consider it. *Standing Rock*, 985 F.3d at 1048.

B. NHTSA's 13:1 threshold is also contrary to the record and arbitrary

Even if it had been articulated in the Final Rule, the agency's 13:1 threshold is doubly flawed. *First*, it is contrary to the record. *Genuine Parts Co. v. EPA*, 890 F.3d 304, 312 (D.C. Cir. 2018). Automakers already use 13:1 Atkinson-enabled engines to power sport utility vehicles that exceed the capabilities of many pickups—and do so without knocking. *Second*, even on its own terms, the agency's assertion that a 13:1 ratio is necessary for efficiency gains, but will unacceptably knock, is not supported by the record. The agency cites no study, data, or empirical example that a 13:1 engine will unacceptably knock in any

pickup. And even if the "full" efficiency benefit is obtained at 13:1, NHTSA nowhere explains why an intermediate ratio would not produce a "significant" efficiency benefit. Automakers clearly see a benefit to ratios above a "standard" 10:1 (NHTSA-Br. 92), or else they would not have invested in producing them, as Toyota has for the Tacoma (11.8:1) and Dodge has for the Ram (11.3:1). NHTSA-Br. 107. NHTSA's rigid 13:1 threshold is arbitrary and capricious. *Tripoli Rocketry Ass'n v. ATF*, 437 F.3d 75, 81–83 (D.C. Cir. 2006).

1. NHTSA's 13:1 threshold is contrary to the record because automakers already use 13:1 engines in heavy vehicles with high-torque capabilities

NHTSA says torque generation is the "relevant factor" for assuming 13:1 engines will unacceptably knock in pickups. NHTSA-Br. 110–111. The agency does not cite—or appear to have compiled—comprehensive torque data. But values in the record show that pickups vary significantly in torque capability: from at least 510 lb-ft down to just 180 lb-ft.[7]—a 283% spread.

The agency says a 13:1 engine is "incapable" of delivering any pickup's advertised torque without knocking. NHTSA-Br. 111. But that

[7] JA__[Tacoma.Specifications]; JA__[Raptor.Specifications].

is obviously wrong. Large sport utility vehicles—which can also haul and tow heavy loads—use 13:1 Atkinson-enabled engines, have *more* torque than many pickups, and do not exhibit knocking problems. NHTSA has not identified any reason why knocking problems would occur when towing with pickups, but not when towing with more powerful sport utility vehicles.

For example, both the Telluride and Palisade sport utility vehicles use 13:1 Atkinson-enabled engines and generate 262 lb-ft of torque.[8] This torque is well above minimum pickup capability (180 lb-ft), and equivalent to many other pickups, including the Ridgeline, the Atkinson-equipped Tacoma, the Ram 1500, and the Jeep Gladiator (262, 265, 269, and 260 lb-ft, respectively).[9] Indeed, sport utility vehicles like the Telluride are specifically marketed for their off-road and towing capabilities.[10] In essence, NHTSA arbitrarily claims that 13:1 ratio engines can work in sport utility vehicles, but not in pickups with identical torque requirements.

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[8] JA__[Palisade.Specifications]; JA__[Telluride.Brochure.p12].

[9] JA__[Ridgeline.Specifications]; JA__[Tacoma.Specifications]; JA__[Ram.Specifications.p2]; JA__[Gladiator.Specifications].

[10] JA__[Telluride.Brochure.p6.p12.p13].

To escape this bind, NHTSA's brief cursorily suggests that pickups, as a class, are inherently different from other vehicles. But none of the supposed distinctions make sense or are supported in the record. Pickups vary significantly in size, weight, and power, including torque. The Titan can weigh 170% as much as the Colorado (6,753 vs. 3,936 pounds), for example, and the Raptor can have almost *triple* the horsepower of the Tacoma (450 vs. 159 hp).[11] Even if a 13:1 engine were somehow infeasible for a Titan, for example—and NHTSA provides no data that it is—it is irrational for NHTSA to assume that it is necessarily infeasible for much lighter vehicles, like the Colorado, simply because both are labeled a "pickup." *Herrington*, 768 F.2d at 1396–1398 (agency may not conclude "all" applications of a technology are infeasible "merely by asserting that *many* or even *most*" might be).

The agency is simply incorrect when it asserts that pickups are categorically "larger," "heavier," or "high[er] power[ed]" than all *other*

[11] *MarketDataFile*, vehicles_tab, column=AM, BA. NHTSA's market data file is located at https://www.nhtsa.gov/file-downloads?p=nhtsa/downloads/CAFE/2022-FR-LD-2024-2026/Central%20Analysis/. *See* NHTSA-Br. 11 n.1.

vehicle classes. NHTSA-Br. 94, 96, 101, 103.[12] Nor do pickups categorically have "a larger front profile," "larger tires," or "the greater demand of four-wheel drive" compared to other vehicle classes. NHTSA-Br. 101.[13] *First*, close to half a million pickups sold each year are not even equipped with four-wheel drive,[14] making that rationale inapplicable. *Second*, pickups do not categorically have larger tires than sport utility vehicles.[15] The Expedition sport utility vehicle, for example, comes with wider, larger-diameter tires than those on the Canyon, Colorado, Ridgeline, Tacoma, and other pickups.[16] *Third*, "larger front profile" is vague, but many sport utility vehicles are wider and taller

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[12] For example, the Telluride sport utility vehicle's footprint is almost identical to that of the Ranger pickup (53.5 vs. 54 ft^2), but the Telluride is both heavier (4,482 vs. 4,145 pounds) and more powerful (291 vs. 270 horsepower). *MarketDataFile*, *supra*, vehicles_tab, column AL, AM, BA.

[13] NHTSA misreads its source. As explained (NRDC-Br. 41–42), Toyota was comparing the Tacoma pickup to a Camry *sedan*. The Tacoma may have a worse drag profile than a sedan, but that does not mean pickups all have worse drag profiles than all other vehicles.

[14] *MarketDataFile*, *supra*, vehicles_tab, columns V, AG.

[15] "Large" does not explain if the agency means tire diameter, width, or thickness. *How Do I Read My Tire Size On My Sidewall*, TireRack.com, https://www.tirerack.com/upgrade-garage/how-do-i-read-my-tire-size-on-my-sidewall.

[16] JA__[Expedition.Specifications]; JA__[Canyon.Specifications]; JA__[Colorado.Specifications]; JA__[Ridgeline.Specifications]; JA__[Tacoma.Specifications].

than pickups. For example, the LX570 is 4 inches taller and 3 inches wider than the Tacoma.[17]

By modeling large sport utility vehicles like the LX570 as fully capable of upgrading to 13:1 Atkinson-enabled engines, the agency undermines its own rationale for excluding such engines from pickups. The LX570 weighs three tons, has 383 horsepower, 403 lb-ft of torque, and can tow 7,000 pounds.[18] It exceeds the "marketed ... capabilities" (NHTSA-Br. 100) of the Tacoma pickup, and others, by significant amounts. In a word, it is arbitrary for NHTSA to acknowledge that the LX750 sport utility vehicle could upgrade to a 13:1 ratio Atkinson-enabled engine and at the same time contend that the Tacoma (and all pickups less capable than the LX750) cannot do so.

Indeed, EPA, which regulates tailpipe emissions, concludes that all six-cylinder engine pickups—even the largest—can use 13:1 Atkinson-enabled engines. 86 Fed. Reg. 74,434, 74,474–75 (Dec. 30, 2021). So do the vehicle experts at California's Air Resources Board. JA__[CARB.p4]. To be sure, NHTSA must exercise independent judgment to fulfill its

[17] JA__[LX570.Specifications]; JA__[Tacoma.Specifications].

[18] JA__[LX570.Specifications].

statutory mandate. But it is notable that both other leading vehicle regulators determined pickups can use these engines, and NHTSA nowhere addresses its divergence in either the record or its briefing.

2. NHTSA's 13:1 threshold is arbitrary on its own terms

Setting aside the existence of heavy sport utility vehicles that use 13:1 Atkinson-enabled engines without knocking problems, NHTSA cites *no* data that unacceptable knocking will occur in in *any* pickup—let alone *all* pickups. And NHTSA nowhere explains why it concluded 13:1 was the threshold, and not 14:1, or 15:1, or something else entirely.

As an initial matter, the agency contends it "can hardly be faulted for limiting the high compression ratio engine technology to those areas in which it has been successfully deployed." NHTSA-Br. 109. But Congress "intended [fuel economy standards] to be technology forcing." *Ctr. for Auto Safety v. NHTSA*, 793 F.2d 1322, 1339 (D.C. Cir. 1986). NHTSA's task is to determine what automakers "can" do, 49 U.S.C. § 32902(a), not what they already "have" done. The agency cannot lawfully set standards constrained by automakers' torque marketing. NHTSA must identify technologically feasible and economically practicable means to maximize fuel economy. *Id.* § 32902(a), (f). The

record contains no evidence that it is "infeasible" or "impracticable" for automakers to modestly reduce advertised torque on some pickups. The record fact that 75% of pickup owners almost never tow shows there is a large market for passenger-carrying trucks. NRDC-Br. 32.

Regardless, NHTSA adduces *no* evidence—no study, no data, no empirical example—that a pickup cannot use a 13:1 engine without knocking. The agency's brief spends many pages on generalized discussion of undisputed aspects of basic engine operation. But it never explains how the agency "arrived at the *specific* conclusion" that a 13:1 engine knocks in every pickup. *See Bluewater Network v. EPA,* 370 F.3d 1, 21 (D.C. Cir. 2004).[19]

[19] Such generalized discussion is no basis for the agency to receive technical deference on a specific assumption. The agency's cited cases (NHTSA-Br. 114) are inapt. Those are cases where agencies had—or sought—robust amounts of scientific data to justify a specific technical assumption. *See, e.g., Troy Corp. v. Browner,* 120 F.3d 277, 289 (D.C. Cir. 1997) (conclusions about toxicity of a chemical class drawn from six studies of representative chemicals); *A.L. Pharma, Inc. v. Shalala*, 62 F.3d 1484, 1487, 1490 (D.C. Cir. 1995) (conclusions about drug "bioequivalency" drawn from commissioned empirical study of relevant drug); *Ctr. for Biological Diversity v. EPA*, 749 F.3d 1079, 1086 (D.C. Cir. 2014) (agency reasonably sought additional empirical input data before relying on model of acid rain impacts).

The agency does explain that *if* the fuel-air mixture is over-compressed in the cylinder, the mixture can auto-ignite (knock). NHTSA-Br. 90. That's true of any engine. But the agency never explains why a 13:1 engine *will* over-compress in every pickup when generating its advertised torque.

NHTSA must provide "*some* metric" for classifying 13:1 as *too* high. *Tripoli Rocketry*, 437 F.3d at 81. The agency never provides one. Indeed, the agency fails to provide metrics throughout. In particular, the agency says pickup torque reserves must be "large," but never "how large." *See* NRDC-Br. 35. This is a significant omission. The agency argues that pickups' maximum torque requirements rule out 13:1 engines. NHTSA-Br. 110-112. But it never states what that torque requirement is.

At bottom, NHTSA's argument is that 13:1 is higher than the 11.8:1 ratio already used in the Tacoma pickup. This does not prove that a pickup engine will knock at a 13:1 ratio. NHTSA's position rests on an "unbounded relational" argument and is therefore arbitrary and capricious. *Tripoli Rocketry*, 437 F.3d at 81.

II. "Parts Sharing" Cannot Justify a Blanket Exclusion on Considering Atkinson Upgrades to Sport Utility Vehicles

The agency also assumed that no sport utility vehicle currently using the same engine as a pickup can upgrade to a high-compression-ratio Atkinson-enabled engine. This assumption affects millions of vehicles—but the agency offers no meaningful justification for it.

In the Final Rule, NHTSA claimed that "the duty cycle for these heavy vehicles ... minimizes the advantage of Atkinson cycle use." 87 Fed. Reg. at 25,789. In its brief, the agency does not defend this technology-based infeasibility contention. *Compare* NRDC-Br. 43–44. Instead, the agency now claims it is *economically* impracticable for automakers to upgrade the engines for these sport utility vehicles.

This argument fails for two reasons. *First*, the agency's economic rationale is (again) post hoc. *Second*, the economic rationale is not supported by the record.

A. The agency's brief presents a post hoc rationale. The Final Rule said that vehicles with shared engines need "large torque reserves ... that minimiz[e] the advantage of Atkinson cycle use." 87 Fed. Reg. at 25,789. That explanation neither mentions cost nor references the

generalized parts-sharing discussion that the agency now cites. The agency may not force NRDC or this Court to "chase a moving target" like this. *Dep't of Homeland Sec. v. Regents of the Univ. of California*, 140 S. Ct. 1891, 1909 (2020).

The agency protests that the economic rationale was "discern[ible]" (NHTSA-Br. 115) because NRDC anticipated it in its brief. Not so. NRDC guessed the agency might argue that automakers could economically upgrade vehicles only in a particular sequence—with sales-leading vehicles preceding lower-selling vehicles with the same engine. *See* NRDC-Br. 44–46. But NHTSA says *that* rationale "has no application" here. NHTSA-Br. 116. If NRDC guessed at and responded to an inapplicable rationale, the agency cannot say NRDC readily discerned the agency's purportedly real rationale.

Moreover, scattered record references to parts sharing do not render NHTSA's rationale readily discernible. Those references appear in "generalized discussion[s]" of compliance modeling and lack any link to the specific assumptions around Atkinson technology. *See Bluewater*

Network, 370 F.3d at 21; *see also Appalachian Voices v. U.S. Dep't of the Interior*, 25 F.4th 259, 273-74 (4th Cir. 2022).

B. The agency's new economic rationale is not supported by the record in any event. Even if it is *more* economical for automakers to upgrade all vehicles with shared engines in the same way, it does not follow that upgrading the engine in one vehicle line differently from another is economically *im*practicable. *See* 49 U.S.C. § 32902(f) (agency must consider "economic[ally] practicab[le]" options). NHTSA's assertion that it is convenient for automakers to use parts sharing "to achieve economies of scale, deploy capital efficiently, and make the most of shared research and development expenses" (NHTSA-Br. 104) does not prove the impracticability of upgrading sport utility vehicles separately from pickups. *See Env't Def. Fund v. FERC*, 2 F.4th 953, 973 (D.C. Cir. 2021) (agency could not rely on "ipse dixit" that benefits of proposed pipeline would outweigh costs).

The only "evidence" the agency adduces in its brief is a generic estimate of the cost range to develop *entirely new* engines. NHTSA-Br. 105. That does not support the agency's assumption. The estimate is for an "all new engine" with "[l]ittle to no carryover from previous

generation." Nat'l Acad. of Scis., *Cost, Effectiveness, and Deployment of Fuel Economy Technologies for Light-Duty Vehicles* 256 (2015). NHTSA has not shown Atkinson upgrades require "all new engine" design. Indeed, the agency acknowledges that "most vehicles utilize variable valve timing, and thus can achieve some level of Atkinson cycle-like behavior" already. NHTSA-Br. 93. And automakers already produce 13:1 Atkinson-enabled engines. To be sure, automakers need to tailor engines to new platforms, but it is unreasonable to assume that cost would remotely approach the cost of a brand-new engine design.

Importantly, automakers already offer many sport utility vehicles with *multiple* engine options, some of which are not shared with any pickup. For example, the Jeep Wrangler, Dodge Durango, Chevy Blazer, and other sport utility vehicles are offered both with an engine that is shared with a pickup and with an engine that is not.[20] In other words, the record leaves the agency with no support for a conclusion that it

[20] *See, e.g.*, *MarketDataFile*, vehicles_tab, column H (Wrangler, engine 122011), (Durango, engine 126401), (Blazer, engine 112012).

would be uneconomic to put different engines in sport utility vehicles and pickups.[21]

And NHTSA's view that engines "once-shared" are "always-shared" (NHTSA-Br. 105) is contrary to the record. Automakers can—and do—create new vehicle sharing families, break up old families, and discontinue vehicles within families. Indeed, the agency's example of an engine-sharing family (NHTSA-Br. 118, citing 83 Fed. Reg. 42,986, 43,175 (Aug. 24, 2018)) demonstrates this. In 2016, this family included the Equinox sport utility vehicle, which shared a 6-cylinder engine with the Colorado and Canyon pickups. 83 Fed. Reg. at 43,175. The Equinox was also sold with a 4-cylinder engine that was not shared with any pickup. Under the agency's view, when it came time to upgrade the 6-cylinder Equinox engine, the automaker must have upgraded it in the same way as the pickups. In fact, the automaker broke the supposed

[21] Consider an automaker that produces two engines, one shared by Pickup A and Sport Utility B, the second used by similar Sport Utility C. NHTSA's economic rationale does not explain why the automaker cannot upgrade both sport utility vehicles together with a shared Atkinson-enabled engine and upgrade the pickup with a different engine. The automaker produces two engine designs either way.

engine-sharing rule, replacing the Equinox's 6-cylinder engine with a different 4-cylinder engine that is not shared with either pickup.[22]

III. NHTSA Cannot Wave Away Challenges to Its Other Technology Assumptions

As explained in NRDC's opening brief, NHTSA made other arbitrary assumptions that excluded half a million vehicles from being considered for upgrade to a high-compression-ratio Atkinson-enabled engine. NRDC-Br. 46–48. The agency first argues these challenges were forfeited. The agency then argues the assumptions are justified. NHTSA-Br. 117–119. Both arguments fail.

First, commenters did raise these issues during the rulemaking, arguing that *none* of NHTSA's rationales justified excluding *any* vehicle from adopting an Atkinson-enabled engine. *See, e.g.*, JA__[CARB.p4]; JA__[NRDC.p46–47]. Those challenged rationales included NHTSA's assumption that vehicles with 405 or more horsepower cannot use these engines. JA__[CARB.p4]. The agency now invokes those exact challenged rationales to justify modeling the vehicles identified by NRDC (NRDC-Br. 47–48) as unable to use high-compression-ratio

[22] *MarketDataFile*, vehicles_tab, columns E, H (Equinox, engines 111511, 112012).

Atkinson-enabled engines. NHTSA-Br. 118–119. The agency cannot avoid defending its choice to exclude vehicles from upgrading in its model under these rationales.

Second, on the merits, NRDC's opening brief identified 440,000 General Motors vehicles that NHTSA modeled as incapable of using high-compression-ratio Atkinson-enabled engines. NRDC-Br. 47. NRDC described this as an apparent error, as these vehicles did not appear to meet any of NHTSA's rationales. *Id*. The agency now suggests these vehicles were excluded because they share an engine with a pickup. NHTSA-Br. 118. If so, these exclusions would be arbitrary and capricious for the reasons discussed above, *supra* Section II.

The agency's brief actually says these vehicles use "variants" of engines used in pickups. NHTSA-Br. 118. But the agency nowhere explains what a "variant" is; why a "variant" is still "shared;" or how it determined the automaker could not upgrade these engines. The lack of explanation renders the exclusion of these vehicles arbitrary and capricious. *Genuine Parts*, 890 F.3d at 312.

NRDC's opening brief also identified 144,000 other improperly excluded vehicles. NRDC-Br. 47–48. The agency's brief concedes that

"NHTSA did not expressly identify" in the Final Rule what rationale applied to these vehicles. NHTSA-Br. 119. The agency now contends it was a combination of "parts sharing" and its assumption that high-compression-ratio engines cannot be used in "vehicles with 405 or more horsepower." *Id*. But the excluded vehicles do *not* have 405 or more horsepower—they have less. NRDC-Br. 48. These vehicles have engines that are shared in *other* vehicles with 405 or more horsepower. In other words, the agency is saying that when it said "*vehicles*" in the Final Rule, 87 Fed. Reg. at 25,789, it obviously meant "*engines*." That is not obvious at all—it is post hoc. *Standing Rock*, 985 F.3d at 1048.

CONCLUSION

NRDC identifies multiple errors in the agency's core modeling assumptions. NHTSA does not dispute that any one of these errors would be material: "If this Court were to find any error in NHTSA's treatment of high compression ratio engines," the agency says, "the Court should remand the rule to NHTSA without vacatur, as petitioner requests." NHTSA-Br. 97. Accordingly, the Court should remand the Final Rule, without vacatur, for the agency to correct its errors

regarding the exclusion of Atkinson-enabled engines and to reconsider the feasibility of more stringent standards.

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Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

I hereby certify that the foregoing brief was composed in 14-point Century Schoolbook font and complies with applicable typeface and type-style requirements. The brief contains 4,732 words and complies with the type-volume limitations of this Court's order of September 22, 2022. ECF No. 1965625.

/s/ *Pete Huffman*
Pete Huffman

Dated: May 5, 2023

CERTIFICATE OF SERVICE

I hereby certify that on May 5, 2023, I filed the foregoing brief and attachments on all parties through the Court's electronic case filing (ECF) system.

/s/ *Pete Huffman*
Pete Huffman