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United States Court of Appeals,
District of Columbia Circuit.

AMERICAN PETROLEUM INSTITUTE, Petitioner
v.
ENVIRONMENTAL PROTECTION AGENCY, Respondent
American Chemistry Council, et al., Intervenors

No. 09-1038
|
Consolidated with 15-1083, 15-1085, 15-1088, 15-1089, 15-1094
|
Argued November 3, 2016
|
Decided July 7, 2017

On Petitions for Review of a Final Regulation Promulgated by the United States Environmental Protection Agency

Attorneys and Law Firms

Jeremy C. Marwell and Thomas Sayre Llewellyn, Washington, DC, argued the causes for Industry Petitioners. With them on the briefs were Stacy R. Linden, Matthew A. Haynie, Dallas, TX, Aaron J. Wallisch, Washington, DC, Laura E. Boorman, Raleigh, NC, Kevin A. Gaynor, John P. Elwood, Roger R. Martella, Jr., Joel Visser, Washington, DC, Linda E. Kelly, Houston, TX, Quentin Riegel, and Leslie A. Hulse, Washington, DC. Wayne D'Angelo, Harry M. Ng, and Michael R. See, Washington, DC, entered appearances.

Kenneth M. Kastner, Washington, DC, was on the brief for amici curiae Eastman Chemical Company and Solvay USA Inc. in support of Industry Petitioners.

James S. Pew argued the cause for Environmental Petitioners. With him on the briefs was Khushi K. Desai, Washington, DC.

Daniel R. Dertke, Attorney, U.S. Department of Justice, argued the cause for respondents. With him on the brief were John C. Cruden, Assistant Attorney General, Douglas M. Bushey, Attorney, U.S. Department of Justice, and Alan Carpien, Attorney, U.S. Environmental Protection Agency.

Donald J. Patterson, Jr., Washington, DC, argued the cause for Industry Intervenor–Respondents. With him on the brief were Eric L. Klein, Aaron J. Wallisch, Washington, DC, Laura E. Boorman, Raleigh, NC, John L. Wittenborn, Wayne D'Angelo, Kevin A. Gaynor, John P. Elwood, Jeremy C. Marwell, Leslie A. Hulse, Washington, DC, Linda E. Kelly, Houston, TX, Quentin Riegel, Roger R. Martella, Jr., Joel Visser, James W. Conrad, Jr., Thomas Sayre Llewellyn, Washington, DC, Stacy R. Linden, and Matthew A. Haynie, Dallas, TX. Douglas H. Green, Washington, DC, entered an appearance.

David R. Case, James S. Pew, Khushi K. Desai, Washington, DC, and Vincent Atriano, Columbus, OH, were on the joint brief for respondent-intervenors and movant-intervenor Gulf Chemical and Metallurgical Corp.

Before: Tatel and Kavanaugh, Circuit Judges, and Williams, Senior Circuit Judge.

Opinion

Opinion dissenting in part filed by Circuit Judge Tatel.

Per Curiam:

This case arises from the Environmental Protection Agency's latest effort to define the term "solid waste" under the Resource Conservation and Recovery Act. In 2015, EPA promulgated a final rule governing when certain hazardous materials qualify as "discarded" and hence are subject to the agency's regulatory authority. Environmental and Industry Petitioners have each petitioned for review of that rule, arguing that numerous aspects of it are unlawful and arbitrary and capricious. For the reasons explained, we grant the Industry petition for review with respect to Factor 4 of the legitimacy test and to the Verified Recycler Exclusion and we dismiss the Environmental petition for review.

I. Introduction

The Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. §§ 6901–6992k, empowers EPA to manage solid and hazardous waste. The statute defines solid waste as "garbage, refuse, sludge ... and other discarded material." 42 U.S.C. § 6903(27). Hazardous waste is a subset of solid waste that may pose a substantial threat to human health or the environment when improperly managed. § 6903(5)(B). If a material qualifies as hazardous waste, it is subject to regulation under RCRA Subtitle C, §§ 6921–6939g, which imposes comprehensive reporting and operating requirements. Material that is not solid waste, and therefore not hazardous waste, is exempt from Subtitle C.

Pursuant to its RCRA authority, EPA has promulgated a rule defining solid waste as "discarded material" not otherwise excluded from the agency's regulations. 40 C.F.R. § 261.2(a)(1). A separate regulation lists materials that fall outside the definition of solid waste. § 261.4. Central to the issues before us, EPA considers certain materials that are destined for recycling to be discarded and hence solid waste subject to RCRA regulation. *Definition of Solid Waste*, 80 Fed. Reg. 1,694, 1,738/3 (Jan. 13, 2015) (the "*Final Rule*").

For our purposes, the relevant history begins in 2007, when EPA proposed a rule deregulating many hazardous secondary materials. See *American Petroleum Institute v. EPA*, 683 F.3d 382, 385 (D.C. Cir. 2012) ("*API II*"). Secondary materials are substances generated as the remainder of industrial processes; they include spent materials, byproducts, and sludges. See 40 C.F.R. § 260.10. EPA's proposed rule—which became a final rule in October 2008—excluded hazardous secondary materials from the definition of solid waste in two circumstances: first, if the company that generated the materials controlled the recycling of those materials; and second, if the generator transferred the materials to an off-site recycler it had audited to ensure compliance with proper recycling practices. *Revisions to the Definition of Solid Waste*, 73 Fed. Reg. 64,668, 64,669/3–70/1–2 (Oct. 30, 2008) (the "*2008 Rule*"). These two exemptions were known, respectively, as the "Generator–Controlled Exclusion" and the "Transfer–Based Exclusion." *Id.* at 64,670/1, 64,675/2 (capitalization added). To qualify for either, secondary materials had to be recycled "legitimately," a term EPA defined by reference to certain "legitimacy factors." *Id.* at 64,675/2–3. EPA adopted this legitimacy requirement to distinguish "true" recycling from "sham" recycling in which companies claim to reuse materials they in fact discard. *Id.* at 64,700/2.

***2** Several organizations challenged the *2008 Rule*. One, the American Petroleum Institute, argued that the rule unlawfully regulated materials called spent petroleum refinery catalysts, which are byproducts of the oil refining process. *API II*, 683 F.3d at 387. Another group, the Sierra Club, asserted that the rule "was not sufficiently protective of human health and the environment," in violation of RCRA. *Id.* at 389. A third entity, Gulf Chemical and Metallurgical Corporation ("Gulf"), moved to intervene to defend the rule's treatment of spent catalysts.

Before this court heard oral argument, EPA entered a settlement agreement with the Sierra Club. *Id.* Pursuant to that agreement, the Sierra Club withdrew its petition, and EPA agreed to propose a new solid waste rule. *Id.* As promised, EPA published a notice of proposed rulemaking in July 2011. *Definition of Solid Waste*, 76 Fed. Reg. 44,094 (July 22, 2011) (the "*Proposed Rule*"). A year later, we held that API's challenge to the 2008 rule was unripe given the forthcoming final rule. *API II*, 683 F.3d at 384. We deferred any action on Gulf's motion to intervene, which is dealt with in a separate order published today.

EPA promulgated the *Final Rule* on solid waste—the one before us now—in January 2015. 80 Fed. Reg. at 1,694/1. The 2015 *Final Rule* differs from the *2008 Rule* in several ways, four of which are relevant here. First, the *Final Rule* revises the definition of "legitimate" recycling and expands the scope of the legitimacy factors to cover all recycling. *Id.* at 1,719/3–20/1. Second, it establishes that spent catalysts—which were ineligible for exclusions under the *2008 Rule*—could qualify for the exemptions in the 2015 regulation. *Id.* at 1,738/1. Third, the rule defers a decision on whether to add conditions to 32 previously promulgated exclusions from the definition of solid waste, which EPA calls the "pre–2008" exclusions. *Id.* at 1,741/2. Fourth and finally, the rule replaces the transfer-based exclusion with the "Verified Recycler Exclusion," a new

standard governing when transferred materials qualify as solid waste. *Id.* at 1,695/2. We provide additional detail on each of these provisions later in this opinion.

Multiple organizations petitioned for review of the 2015 rule. Their petitions, which are consolidated in this case, challenge the regulation on multiple fronts. Industry Petitioners argue that both the legitimacy test and the Verified Recycler Exclusion exceed EPA's RCRA authority. Industry Petitioners also challenge EPA's treatment of two specific materials: spent catalysts and off-specification commercial chemical products. Environmental Petitioners argue that the Verified Recycler Exclusion is too permissive and that EPA should have added containment and notification conditions to the 32 pre–2008 exclusions. We consider these challenges in turn.

II. Legitimacy Factors

Industry Petitioners first attack EPA's new legitimacy test. Before EPA can regulate a hazardous secondary material as hazardous waste, it must determine that the material has been "discarded" under 42 U.S.C. § 6903(27). Items recycled through "immediate reuse in" an "industry's ongoing production process," are not discarded within the meaning of that section and are outside EPA's hazardous waste regulations. See *American Mining Congress v. EPA*, 824 F.2d 1177, 1183–85 (D.C. Cir. 1987) ("*AMC*"); see also *Ass'n of Battery Recyclers, Inc. v. EPA*, 208 F.3d 1047, 1052–53 (D.C. Cir. 2000) (explaining that "immediate" in *AMC* means "direct," not instantaneous). But because EPA's waste disposal regulations are acknowledged to be very costly to meet, "there is an incentive for some handlers to claim they are recycling when, in fact, they are conducting ... disposal." *Final Rule*, 80 Fed. Reg. at 1, 719/3. To prevent such evasion, EPA polices the line "between 'legitimate' (*i.e.*, true) recycling and 'sham' (*i.e.*, fake) recycling." *Id.* at 1,720/1.

***3** Until recently, EPA's policy on sham recycling existed chiefly in uncodified guidance, notably a memo issued in 1989 by Sylvia K. Lowrance, Director, EPA Office of Solid Waste (Apr. 26, 1989) (the "*Lowrance Memo*"). The memo discussed over a dozen factors for evaluating recycling, all aimed at determining "whether the secondary material is 'commodity-like,' " i.e., is it being handled like a valuable industrial input or like a worthless industrial byproduct. See *id.* at 2 & attachment.

The *Final Rule* updates and codifies this effort to draw the distinction between legitimate and sham recycling. It requires that all recycling of hazardous secondary materials meet a legitimacy test set forth in 40 C.F.R. § 260.43(a) or else be labeled "sham" and subjected to full RCRA regulation. 40 C.F.R. § 261.2(g). Like the *Lowrance Memo*, the rule is rooted in the assumption that legitimate recycling should involve some "recognizable benefit," *Final Rule*, 80 Fed. Reg. at 1,722/1, independent of merely "avoid [ing] the requirements of" RCRA regulation, *id.* at 1,719/3.

To satisfy the legitimacy test for recycling of a particular material, firms must prevail on all of four factors, § 260.43(a)(1)–(4), which are in addition to whatever elements a specific exclusion might require, see *Final Rule*, 80 Fed. Reg. at 1,720/2. First, the hazardous secondary material must "provide[ ] a useful contribution to the recycling process." § 260.43(a)(1). Second, "[t]he recycling process must produce a valuable product or intermediate." § 260.43(a)(2). Third, the persons controlling the secondary material must "manage the hazardous secondary material as a valuable commodity." § 260.43(a)(3). Fourth, "[t]he product of the recycling process must be comparable to a legitimate product or intermediate." § 260.43(a)(4). Factors 1 and 3 address the process, Factors 2 and 4 the product.

Industry Petitioners do not attack EPA's authority to formulate and apply a legitimacy test, nor do they fault EPA's premise that legitimate recycling involves "valuable" materials being used for a "recognizable benefit." *Final Rule*, 80 Fed. Reg. at 1,697/3, 1,722/1. At that level of generality, EPA's policy seems to be a reasonable method for identifying materials that are "part of the waste disposal problem" and thus subject to EPA's RCRA authority over discarded materials. *Safe Food & Fertilizer v. EPA*, 350 F.3d 1263, 1268 (D.C. Cir. 2003). Industry Petitioners instead attack EPA's planned means to implement that policy. They complain that mandating Factors 3 and 4 across all recycling results in

EPA's "unlawfully regulat[ing] non-discarded materials." Industry Pet'rs' Br. 16 (capitalization omitted).

A. Factor 3

We begin with Factor 3, which requires secondary materials to be handled as "valuable commodit[ies]." 40 C.F.R. § 260.43(a)(3). Where there is an analogous raw material, the firm can meet this standard by handling the secondary material "in an equally protective manner." *Id.* If there is no raw analogue for comparison, EPA requires that the secondary material be "contained." *Id.* "Contained" means "held in a unit (including a land-based unit ...) that meets" multiple enumerated criteria, including that the unit be "labeled or otherwise ha[ve] a system (such as a log) to immediately identify the hazardous secondary materials" therein. 40 C.F.R. § 260.10 (entry for "*Contained*"). "[L]and-based unit[s]," *id.*, encompass, at least for some materials such as scrap metal, simply lying on the ground, see *Final Rule*, 80 Fed. Reg. at 1,721/3, 1,736/2.

***4** EPA previously claimed that any "interdiction in time" during a secondary material's trajectory from initial output to recycling, e.g., for storage, could be considered discard and thus trip the material into EPA's RCRA authority. *Battery Recyclers*, 208 F.3d at 1052 (internal quotation marks omitted). We rejected that rule. "To say that when something is saved it is thrown away is an extraordinary distortion of the English language." *Id.* at 1053. Industry Petitioners read that holding to bar EPA from ever regulating how recycled materials are contained. Their reading goes too far. EPA can impose a containment requirement so long as it is such that an inference of "sham" or illegitimacy would logically flow from a firm's non-compliance. And given EPA's explanation that a material may be "contained" if it is simply piled on the ground, *Final Rule*, 80 Fed. Reg. at 1,721/3, 1,736/2, and meets specific requirements that petitioners do not challenge as unreasonable (with one exception, the "labelling" requirement discussed below), the standard does not on its face appear to ask for anything beyond what could be expected of firms engaged in legitimate recycling.

Industry Petitioners express concern about having to label or log unwieldy molten metals and acidic sludges to satisfy EPA's insistence on material being "contained." But EPA offers an alternative to labelling in the conventional sense —provision of "a system (such as a log) to immediately identify the hazardous secondary materials in the unit." § 260.10. Thus, in substance, the requirement is not precisely one of labeling or logging, but only of assuring that it somehow be possible for the material to be "immediately identif[iable]." *Id.* While doubtless EPA's language could be interpreted unreasonably, we cannot see that the requirement itself is unreasonable.

B. Factor 4

Factor 4 presents more difficulty. EPA explains this factor as an effort to prevent recyclers from loading products with hazardous secondary materials that "provide[ ] no recognizable benefit to the product," *Final Rule*, 80 Fed. Reg. at 1,722/1, and are simply "along for the ride," *id.* at 1,726/2. Although EPA does not require a material's "hazardous component[s]" themselves to provide a "useful contribution" to the product, see *id.* at 1,723/3 (discussing Factor 1), the agency is concerned that a purported recycler might "incorporate[ ] hazardous constituents into the final product when they were not needed to make that product effective as a way to avoid proper disposal of that material, which would be sham recycling," *id.* at 1,726/1–2.

The factor sets up two tracks, 40 C.F.R. § 260.43(a)(4)(i)–(ii), one covering products for which there is an analogue of undoubted legitimacy, the other addressing products with no such analogue. EPA refers to these together as the "technical provisions." *Final Rule*, 80 Fed. Reg. at 1,729/1. But as EPA recognizes that the criteria set forth under these two tracks don't draw a satisfactory line between genuine and sham, it also offers a rather complicated exception—aimed at preventing products from being labelled a sham when they in fact pose no "significant human health or environmental risk." § 260.43(a)(4)(iii). But Factor 4's complex provisions fall short of the aim. As we shall see, Factor 4 imposes tasks tangential to disposal *vel non* (and thus tangential to EPA's authority), even

when EPA has offered little reason to doubt a product's legitimacy.

The second track is the more reasonable of the two. When there is no analogue, the recycled product will pass if it was created by looping secondary materials back "to the original process ... from which they were generated" or if it meets "widely recognized commodity standards and specifications." § 260.43(a)(4)(ii)(A)–(B). Those standards or specifications need not address the hazardous aspects of the product. *Final Rule*, 80 Fed. Reg. at 1,728/2–3. And EPA has explained that compliance with "customer specifications" may suffice for "specialty" products. *Id.* at 1,728/1. Although that gloss on "specifications" appears only in EPA's discussion of the with-analogue track, the *Final Rule* offers little indication that the same word in the no-analogue track is meant to read differently on this matter. Compare *id.* at 1,727/3–28/1 (with-analogue), with *id.* at 1,728/2–3 (no-analogue). Putting all this together, if a recycled product, lacking an analogue, fails to satisfy customer specifications, falls short of relevant commodity standards, and is not derived from a closed-loop type process, EPA treats it as discarded (subject to the ultimate exception). These tests focus largely on the utility of the recycling in question, a reasonable inquiry when deciding legitimacy. See *id.* at 1, 728/3 (commodity standards and specifications criteria mean that "market forces [will] dictate" legitimacy); *id.* at 1,729/1 ("looping" criterion appropriate because this type of recycling "conserves the use of raw materials" without adding new hazards).

***5** The other track in Factor 4's technical provisions, applying where the recycled product has an analogue, is more explicitly tuned to the "along for the ride" metaphor. It requires that the recycled product exhibit no hazardous "characteristic" that is absent from the product's analogue. 40 C.F.R. § 260.43(a)(4)(i)(A); see also *Final Rule*, 80 Fed. Reg. at 1,727/1 ("The characteristics are ignitability, corrosivity, reactivity, and toxicity."). This criterion—fenced in as it is by the definitions of those characteristics, see 40 C.F.R. §§ 261.21–.24—also seems reasonable: one would expect analogous products to have similar attributes. But the track goes on from there. Even if the recycled product and its analogue share the same hazardous characteristics, the amount or "levels" of hazardous constituents in the product must be "comparable to or lower than" its analogue's. § 260.43(a)(4)(i)(B). If the product fails that test, it can still be legitimate if it "meet[s] widely-recognized commodity standards and specifications." *Id.* Unlike in the no-analogue track, here the commodity standards and specifications must "specifically address [ ] hazardous constituents." *Id.* Otherwise EPA will regard the product as discarded (subject to the ultimate exception).

We have left EPA some leeway in applying the idea that genuine recyclers cannot include hazardous material just "along for the ride" in their products. Thus in *American Petroleum Institute v. EPA*, 216 F.3d 50 (D.C. Cir. 2000) ("*API I*"), we rejected a challenge under "*Chevron* step one" to a rule that treated "recovered oil" as discarded if it included "extra materials ... that provide *no benefit* to the industrial process." *Id.* at 58–59 (emphasis added). But we hinted that such a rule should reasonably avoid "incidentally regulat[ing] oil containing chemicals [whose presence in the recycled oil was] not caused by sham recycling (and therefore not discarded)." See *id.* at 59.

Judged by that perhaps opaque standard, EPA's "along for the ride" metaphor suffers at least one of the usual dangers of metaphors—imprecision. The record contains examples of hazardous secondary materials that are beneficially recycled into valuable products (recognized as such by EPA), even though those products contain hazardous constituents that do not, in themselves, contribute to the value of the final product. See, e.g., *Final Rule*, 80 Fed. Reg. at 1, 721/1–2 (zinc-containing secondary materials), 1,729/3 (lead-containing secondary materials). In those cases, even if EPA could technically say that some small excess of hazardous constituents has been left in the final product, the mere fact of their presence would not constitute a reasonable basis for dubbing the product or the process a sham. After all, it can be costly to extract tiny amounts of hazardous constituents—potentially on the order of "parts per million," see *id.* at 1,727/2–3—from secondary materials destined for recycling, and no statute has given EPA authority to compel firms to engage in such extraction where failing to do so imposes no health or environmental risk. To rule otherwise would be to disregard the statute's stated "objective [ ]" of "encouraging ... properly conducted recycling." 42 U.S.C. § 6902(a)(6).

EPA made this very point in *Safe Food* to defend its exclusion for recycled zinc fertilizers even though those fertilizers could have "considerably higher" contaminant levels than the corresponding "virgin commercial fertilizer." 350 F.3d at 1269. After reviewing EPA's data on the threat posed by the additional contaminants, we agreed that the excesses of the contaminant levels that EPA allowed (as consistent with legitimate recycling) over those in virgin fertilizer samples "lose their significance when put in proper perspective—namely, a perspective based on health and environmental risks." *Id.* at 1270.

No such perspective is allowed by the "comparable to or lower than" standard for products with analogues. That standard sets the bar at the contaminant level of the analogue without regard to whether any incremental contaminants are significant in terms of health and environmental risks. This problem is reduced, but not eliminated, by firms' option to meet "widely-recognized commodity standards and specifications," 40 C.F.R. § 260.43(a)(4)(i)(B)—including "customer specifications" if the product is made-to-order, *Final Rule*, 80 Fed. Reg. at 1,728/1. Many products might fail this alternative, not because they represent sham recycling, but because the relevant commodity standards or specifications don't address the hazardous constituent levels of concern to EPA. Industry Petitioners contend, and EPA does not contradict, that such standards usually refer to minimum levels of *desired elements* rather than maximum levels of *specific impurities*. Doubtless this track will ensnare some sham recycling, but it does so with a test that is not a "reasonable tool for distinguishing products from wastes." See *Safe Food*, 350 F.3d at 1269.

***6** EPA, having recognized some of the shortcomings in these provisions, created an exception purporting to account for them. See *Final Rule*, 80 Fed. Reg. at 1,729/1. A recycler may avoid the sham label if it "prepare[s] documentation showing why the recycling is, in fact, still legitimate" and notifies regulators. 40 C.F.R. § 260.43(a)(4)(iii). The legitimacy "can be shown" by "lack of exposure from toxics in the product, lack of the bioavailability of toxins in the product, or other relevant considerations which show that the recycled product does not contain levels of hazardous constituents that pose a significant human health or environmental risk." *Id.*

In explaining this exception, EPA has indicated that the question is whether the recycled product will be used beneficially in a manner that reasonably protects against the risks its residual hazardous constituents present. See *Final Rule*, 80 Fed. Reg. at 1,729/1–3. Absence of these circumstances would indicate that the true purpose of the recycling is disposal. Hence, EPA explained in the rulemaking that "lead contaminated foundry sand[ ]" would be sham recycled when packaged as "children's play sand" but that the same material can be legitimately recycled for "mold making in a facility's sand loop." *Final Rule*, 80 Fed. Reg. at 1,729/2–3. The sand is (in a sense) equally hazardous in both cases, but the latter use is legitimate "because ... there is little chance of the hazardous constituents being released into the environment or causing damage to human health"; "there is lead throughout the foundry's process" (i.e., the sand isn't introducing new hazards); and "there is a clear value to reusing the sand" in that industry. *Id.* at 1,729/3. Recyclers can also meet this exception by analyzing the "increased risk" of their product relative to its analogues, if any. *Id.* We read this as saying, in light of EPA's brief, that a recycler can show its product is legitimate by documenting that any incremental risk it presents is not "significant" to health and the environment. See Respondent Br. 42–43 (citing *Safe Food*, 350 F.3d at 1269–71).

Contrary to Industry Petitioners' claims, the general criteria embodied in the Factor 4 exception seem permissible, indeed consistent with our ruling in *Safe Food*. Industry Petitioners also argue that the exception affords EPA unlimited discretion to find discard. The language of Factor 4 and its exception is rather open-ended, so judicial review of EPA's subsequent interpretations would normally be highly deferential, *Auer v. Robbins*, 519 U.S. 452, 461–62, 117 S.Ct. 905, 137 L.Ed.2d 79 (1997), potentially leaving petitioners at the mercy of a different reading in the future. But we note that Factor 4's exception is tuned specifically to "significant human health or environmental risk[s]." 40 C.F.R. § 260.43(a)(4)(iii). And EPA has simultaneously provided an explanation of how to apply the exception along with an example of how a specific material might pass or fail it. *Final Rule*, 80 Fed. Reg. at 1,729/2–3 (foundry sand). These aspects of the rulemaking sufficiently constrict the range of possible interpretations: "[a]n interpretation at

odds with the agency's expressed intent at the time of adoption enjoys no judicial deference." *AT&T Corp. v. FCC*, 841 F.3d 1047, 1054 (D.C. Cir. 2016).

The exception nonetheless falls short of saving the rule, due to the draconian character of the procedures it imposes on recyclers. See Industry Pet'rs' Br. 29, 33. To qualify for the exception just described, a firm must contemporaneously document how its recycling is "still legitimate," notify regulators of that finding, and keep the documents "on-site for three years after the recycling operation has ceased." 40 C.F.R. § 260.43(a)(4)(iii). Failing any of these steps will make a sham out of what would otherwise have been a legitimate product. See *Final Rule*, 80 Fed. Reg. at 1,721/1, 1,735/3–36/1.

*7 EPA is correct that these notice and recordkeeping mandates will create useful "oversight" and may be correct that they constitute only a "minimal burden" on recyclers. *Id.* at 1,730/1, 1,732/1. But paperwork is not alchemy; a legitimate product will not morph into waste if its producer fails to file a form (or loses a copy two years later). EPA insists that it can impose burden-shifting rules even in drawing the line between what it may and may not regulate. Respondent's Br. 58. True enough; but the generality is applicable only if the products subjected to the burden-shifting are such that it would normally be reasonable to expect them to qualify as "discarded" in the absence of affirmative evidence from the recycler. Thus in *American Chemistry Council v. EPA*, 337 F.3d 1060 (D.C. Cir. 2003), we affirmed EPA's decision to put the burden on regulated entities to initiate a "delisting" process preemptively to establish that a given "mixture or derivative" of hazardous waste is not itself hazardous. *Id.* at 1065. Waste handlers would evidently have to undertake this process, concededly "cumbersome," in advance of any EPA enforcement. *Id.* But there EPA had found that "many mixtures of and derivatives from hazardous wastes are themselves hazardous," an inference that those materials' origin in hazardous waste renders highly plausible. *Id.* Further, the rule included exceptions to "prevent [EPA] from casting too wide a net over" materials outside its jurisdiction. *Id.* Compare Dissent at 8. The same might be said of the no-analogue track and the hazardous characteristic criterion. But we cannot say the same for the with-analogue track's "comparable to or lower than" test, even as qualified by the exception for products meeting commodity standards or specifications.

Never in the rulemaking does EPA make out why a product that fails those criteria is likely to be discarded in any legitimate sense of the term. See *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 42, 103 S.Ct. 2856, 77 L.Ed.2d 443 (1983) (agency rules must be "justified by the rulemaking record").

Environmental Intervenors argue that the necessary backing for Factor 4 lies in EPA's report, *An Assessment of Environmental Problems Associated with Recycling of Hazardous Secondary Materials* (Dec. 10, 2014) (the "*Problems Study*"). See Respondent–Intv'rs' Joint Br. 13–14, 16. By its own account, the report was "not exhaustive"; it restricted itself to 250 "easy to find" instances of environmental damage associated with recycling. *Problems Study* at 4 (identifying sources of "potentially relevant" data that the study did not exhaust). Compare Dissent at 11. The study seems to support a proposition, surely indisputable, that recycling can go awry. Further, the authors claim to have identified various causal factors, characterized rather vaguely and clearly overlapping, such as "Improper Disposal of Residuals," "Abandoned Materials," and "Improper Management of Hazardous Secondary Materials." *Problems Study* at 6–8. But none of these bears any obvious relation to the "comparable to or lower than" standard of the with-analogue track. Reading the report liberally, we see around a dozen instances (out of the 250) involving recycled products that possibly would have flunked the technical provisions. See *id.* app'x 1 at 22–23; 26–27; 45–47; 114–15, 121–22; 128–30, 247–48, 258–59, 298–300, 304, 319–320, 339–40, 404–05, 443–44. And some of these products could have already been considered hazardous waste for failing other legitimacy criteria or for being "placed on the land in a manner that constitutes disposal," 40 C.FR. § 261.2(c)(1)(A). See, e.g., *Problems Study* app'x 1 at 299 (recycler allegedly "planned to sell [ ] contaminated ash as fill material to the public").

Thus the study in no way purports to establish that there is any particular probability, much less a reasonable probability, that the recycled products exceeding the "comparable to or lower than" standard will cause damage to health or the environment. But the quality

or relevance of the study makes no difference in this context, as EPA did not rely on it to justify its assumption that materials which fail the technical provisions are "discarded." The study appears to enter EPA's Factor 4 discussion only implicitly via the foundry sand example, and the most EPA inferred from that was that certain recycled products "may or may not be legitimate, depending on the use." *Final Rule*, 80 Fed. Reg. at 1,729/2–3. That conclusion doesn't take us beyond EPA's bare assertion that "high levels of hazardous constituents ... could indicate" discard. *Id.* at 1,726/1.

In *API I*, we were satisfied by EPA's mere "concern[ ]" that some test samples had "unexpected" levels of contaminants (EPA had no evidence that those results were due to adulteration). 216 F.3d at 58. We stressed, though, that "a refiner in a specific case" could show that the product was not adulterated and not discarded. *Id.* at 59. Thus, the rule involved at most a rebuttable presumption, which we have said can "be sustained without an evidentiary showing ... so long as the agency articulates a rational basis." *Sec. of Labor v. Keystone Coal Mining Corp.*, 151 F.3d 1096, 1101 (D.C. Cir. 1998). But our cases show that here a "rational basis," *id.*, means a reason, grounded in common sense or logic, to suppose the inference "so probable that it is sensible and timesaving to assume [its] truth ... until the adversary disproves it," *Nat'l Mining Ass'n v. Babbitt*, 172 F.3d 906, 912 (D.C. Cir. 1999) (quoting *Keystone*, 151 F.3d at 1100–01) (rejecting presumption for which the agency had "not offered any support, scientific or otherwise").

***8** EPA has not offered a sufficient "rational basis." Because a recycler "in a specific case" won't be able to recover from failing to file paperwork and failing the technical provisions, see *API I*, 216 F.3d at 59, EPA must offer more than timorous assertions such as "could indicate" and "may or may not be legitimate," *Final Rule*, 80 Fed. Reg. at 1,726/1, 1,729/2–3.

The dissent sees nothing wrong with EPA's exception procedure. But our colleague's view is significantly colored by an assumption, not made by EPA, that the "comparable to or lower than" standard is inherently reasonable and may not even require an exception. Compare Dissent at ——–——, ——, with *Final Rule*, 80 Fed. Reg. at 1,729/1. The dissent argues that the standard is reasonably limited to situations where constituent levels are "significantly" higher or exceed a "small acceptable range." Dissent at —— (citing *Final Rule*, 80 Fed. Reg. at 1,727/2). But significant as to what? Acceptable against what measure? The rulemaking gives no answer, certainly none linking directly to the "significant human health or environmental risk" criterion used in the exception. § 260.43(a)(4)(iii). Similarly absent is any reference to utility or market acceptance as embodied in the "commodity standards" clauses of subparagraphs (i) and (ii). If either of those perspectives governed the "comparable to or lower than" standard, why would EPA devote separate provisions to them? Not even EPA argues that the "comparable to or lower than" standard is reasonably limited to any such circumstances; we will not adopt a tortured interpretation to infer that it is. See generally *Final Rule*, 80 Fed. Reg. at 1,727/2–3 (explaining standard via examples of "zinc galvanizing metal" and "solvent"). Because the "comparable to or lower than" standard (and, by extension, the with-analogue track) is not reasonably focused on items that are "part of the waste disposal problem," *Safe Food*, 350 F.3d at 1268, the exception process must be adequate to offset that fault. It is not.

For these reasons Factor 4 is unreasonable as a requirement applied, through 40 C.F.R. § 261.2(g), to all hazardous secondary material recycling. (EPA has also written the legitimacy factors into specific exclusions. See, e.g., 40 C.F.R. § 261.4(a)(23)(ii)(E). Petitioners do not challenge Factor 4 as applied to those individual exclusions.)

C. Used Oil Recycling

Industry Petitioners also ask us to invalidate EPA's legitimacy factors as applied to used oil recycling. This request misreads EPA's rules, which exempt used oil from the legitimacy factors along with all the other "requirements of [40 C.F.R.] parts 260 through 268." 40 C.F.R. § 261.6(a)(4).

III. Verified Recycler Exclusion

The *Final Rule* also amended EPA's stance on "reclamation," a type of recycling that occurs when secondary materials are "processed to recover a usable product, or ... regenerated." 40 C.F.R. § 261.1(c)(4), (7). A dead battery is reclaimed, for example, by extracting the still-valuable lead from it. § 261.1(c)(4). The other modes of recycling are "use[ ]" and "reuse[ ]," which occur when "[a] material is ... [e]mployed as an ingredient ... in an industrial process to make a product" or "[e]mployed ... as an effective substitute for a commercial product." § 261.1(c)(5), (7). In the 1980s, EPA adopted a rule manifesting its belief that certain hazardous secondary materials are so "waste-like" that reclaiming them is equivalent to discard. *Hazardous Waste Mgmt. Sys.*, 50 Fed. Reg. 614, 619/1 (Jan. 4, 1985). The materials so classified are spent materials, listed sludges, listed byproducts, and scrap metal—although EPA has a specific exception for the latter. See 40 C.F.R. § 261.2(c)(3) & tbl.1. "Listed" means catalogued by EPA as hazardous in § 261.31 or § 261.32. See *Hazardous Waste Mgmt. Sys.*, 50 Fed. Reg. at 619/1. Because processing something is hardly akin to throwing it away, we held that this reclamation rule improperly regulated materials that were "neither disposed of nor abandoned, but [were] passing in a continuous stream or flow from one production process to another." *AMC*, 824 F.2d at 1190, 1193.

***9** EPA nonetheless kept the reclamation-equals-discard rule, apparently on the reasoning that *AMC* merely "granted the petition for review" without ordering vacatur. See *Revisions to the Definition of Solid Waste*, 72 Fed. Reg. 14,172, 14,176/3–77/1 (Mar. 26, 2007). Instead EPA sought to "implement the *AMC I* opinion" by adding exclusions for specific materials or processes. See, e.g., *Identification and Listing of Hazardous Waste*, 59 Fed. Reg. 38,536, 38,537/1 (July 28, 1994) (adding exclusion for petroleum-refining secondary materials), codified as amended at 40 C.F.R. § 261.4(a)(12). Materials-specific and process-specific exclusions form a large part of the pre–2008 exclusions discussed in the introduction to this opinion. See *Proposed Rule*, 76 Fed. Reg. at 44,139/1–3 (listing pre–2008 exclusions). Further, EPA adopted two general exclusions, which unlike almost all of the pre–2008 exclusions, depend on whether the recycling is performed by a third-party. The first general exclusion, the Generator–Controlled Exclusion, governs reclamation "under the control of the generator," § 261.4(a)(23), and is not challenged here. The other addresses reclamation of materials transferred to and reclaimed by a third-party, and has come in two successive editions. EPA adopted the first edition, the Transfer–Based Exclusion, as part of its *2008 Rule*, 73 Fed. Reg. at 64,669/3–70/1, previously codified at 40 C.F.R. § 261.4(a)(24)–(25) (2014), and replaced it with the current edition, the Verified Recycler Exclusion, in the *Final Rule*, 80 Fed. Reg. at 1,706/3, codified at § 261.4(a)(24).

Under the Transfer–Based Exclusion, the party offloading the materials (the "generator") could send them to a reclaimer that possessed a RCRA permit (or interim status). 40 C.F.R. § 261.4(a)(24)(v)(B) (2014). Alternatively, the generator could send materials to a reclaimer that lacked such a permit or status, if the generator had made "reasonable efforts to ensure that [the chosen] reclaimer intends to properly and legitimately reclaim the hazardous secondary material and not discard it." *Id.* The "reasonable efforts" involved investigating and "affirmatively answer[ing]" specific questions that the regulation posed about the reclaimer. *Id.*

The Verified Recycler Exclusion is quite similar to its predecessor but makes two changes that Industry Petitioners challenge. First, the new exclusion requires the generator to meet special "emergency preparedness" standards in its custody of the materials before shipment. See 40 C.F.R. § 261.4(a)(24)(v)(E) (referring to standards at § 261.400 *et seq.*). For example, the generator's facility must be "maintained and operated to minimize the possibility of a fire, explosion, or any unplanned ... release of hazardous secondary materials" that "could threaten human health or the environment." § 261.410(a). And the generator must (with some exceptions) have certain emergency preparedness processes and equipment in place, such as communications and "fire control" systems. See § 261.410(b)–(f).

Second, the Verified Recycler Exclusion eliminates the "reasonable efforts" option afforded by the Transfer–Based Exclusion and requires that generators send their secondary materials to reclaimers who either have a RCRA permit (or interim status), as in the Transfer–Based Exclusion, or a RCRA variance—in effect an EPA (or state-level) approval of a firm to operate a third-party "reclamation facility." See 40 C.F.R. § 261.4(a)

(24)(v)(B); § 260.31(d) (quoted language); see also § 271.3 (authorizing states to implement RCRA if they meet certain conditions); *Final Rule*, 80 Fed. Reg. at 1,695/2 (describing the new rule); *id.* at 1,715/1, 1,768/2–3 (describing role of "authorized state[s]").

The separate Generator–Controlled Exclusion carries the same emergency preparedness requirements, § 261.4(a)(23)(ii)(F), but it significantly does not mandate a permit, interim status, or variance. It instead asks generators to maintain a "written description of how the recycling meets all four [legitimacy] factors." § 261.4(a)(23)(ii)(E).

Industry Petitioners insist that EPA had no reason, in its 2015 shift to a Verified Recycler Exclusion, to tighten the conditions of its predecessor. Though EPA disagrees, it concedes that "withdrawing the transfer-based exclusion" entirely "would result in hazardous secondary material that is currently being legitimately recycled and not discarded being regulated as hazardous waste," *Final Rule*, 80 Fed. Reg. at 1,708/3, in effect, regulation in excess of EPA's authority as defined in *AMC*. In this perhaps topsy-turvy universe, all spent materials, listed byproducts, and listed sludges being reclaimed are subject to *full* RCRA control unless affirmatively excluded. Because EPA chose to *retain* a rule that improperly treats as discarded materials that are "no longer useful in their original capacity though destined for immediate reuse," *AMC*, 824 F.2d at 1185, it has obliged itself to creating sufficient exceptions to counter that rule's overbreadth.

***10** Given the parties' agreement that some general exclusion for third-party reclamation is necessary, the question before us is whether EPA acted reasonably in adding emergency preparedness requirements and in supplanting the reasonable efforts option with the variance procedure. Specifically, EPA must show 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" than the old one. *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515, 129 S.Ct. 1800, 173 L.Ed.2d 738 (2009).

Although no party challenged the Industry Petitioners' standing on this issue, we noted EPA's assertion in the record that in the almost seven years under the Transfer–Based Exclusion no entity had taken advantage of the reasonable efforts option. See *Final Rule*, 80 Fed. Reg. at 1,708/1–2, 1,709/1. If in the real world the option drew no takers for seven years, could its removal really inflict an injury? Wondering if petitioners' claim of injury was truly plausible, as required by our cases, see, e.g., *Food & Water Watch, Inc. v. Vilsack*, 808 F.3d 905, 913 (D.C. Cir. 2015), we ordered briefing on the issue.

In their supplemental brief, Industry Petitioners supplied the explanation: not long after the Transfer–Based Exclusion was promulgated, "EPA announced that it was seriously considering repeal," which "placed the [ ] exclusion under a cloud of uncertainty." Industry Pet'rs' Supp. Br. 2. Unpermitted entities chose to wait and see if the reports of the rule's imminent demise were true. See *id.* Accordingly, there is no apparent reason to doubt that, as Industry Petitioners insist, EPA's retention of the reasonable efforts option would have led some entities to make use of it.

As to *Fox*'s required justifications for a change in policy, EPA is quite clear which rule, 2008 or 2015, it "*believes* [ ] to be better." 556 U.S. at 515, 129 S.Ct. 1800. EPA bemoaned that the Transfer–Based Exclusion allowed third-party reclaimers to operate without as much oversight as Subtitle C regulation would require. *Final Rule*, 80 Fed. Reg. at 1,707/3. This lack of oversight, EPA believes, "could lead to the potential for an increased likelihood of environmental" damage, thus justifying the *Final Rule*'s changes. *Id.* at 1,708/1; see *id.* at 1,711/2 (describing *2008 Rule*'s "major regulatory gap" from "lack of oversight and public participation").

For the remainder of the *Fox* analysis we address the two challenged provisions separately.

A. Emergency Preparedness Requirements

First up are the emergency preparedness requirements and whether their promulgation meets the requirements of showing consistency with the statute and good reasons for the new rule. *Fox*, 556 U.S. at 515, 129 S.Ct. 1800. For reasons to qualify as "good" under *Fox*, they must be "justified by the rulemaking record." *State Farm*, 463 U.S. at 42, 103 S.Ct. 2856. Here EPA's reasons

for its changes overlap with its statutory justification—to "identif [y] hazardous secondary materials that are legitimately recycled and not discarded," *Final Rule*, 80 Fed. Reg. at 1,709/2—so we analyze the two together.

With the emergency preparedness provisions, EPA's reasoning is mostly a retread of what we encountered with Factor 3. As with the handling requirements, it advances the mandated precautions as an effort to reduce the risk of discard and to test the generator's intent to recycle. See *id.* at 1, 710/2. Here, to be sure, these prophylactic duties go beyond Factor 3's in specificity. Compare 40 C.F.R. § 261.410 (emergency), with § 260.10 (containment). And the inference of "discard" from feckless preparations is less obvious than such an inference from lack of containment (as defined by EPA).

***11** But EPA made findings (unchallenged here) that fires and explosions are a common cause of environmental damage and that planning against such mischance reflects a generator's intent to reduce losses of hazardous secondary materials—materials that a firm intending genuine reclamation would presumably regard as valuable. See *Final Rule*, 80 Fed. Reg. at 1,710/2; *Problems Study* at 7. EPA also found that the secondary materials to be recycled under the Verified Recycler Exclusion (i.e., those materials that are transferred to third parties and that don't qualify for other exclusions) are "often" of negative value to generators, which "typically pay" the reclaimer to take the materials or receive a payment inadequate to cover the costs of transfer. See *Final Rule*, 80 Fed. Reg. at 1,707/2; see also *A Study of Potential Effects of Market Forces on the Management of Hazardous Secondary Materials Intended for Recycling* 3 (Nov. 21, 2006) (the "*Market Study*") (noting that commercial recyclers accept materials "usually for a fee"). Because generators are likely to view these materials more as albatross than asset, it is reasonable for EPA to require additional assurances, beyond those of Factor 3, that the generator values them as elements of a genuine recycling effort.

Petitioners do not claim that the preparation requirements are an unreasonable test of intent, other than to say that they are "highly prescriptive," Industry Pet'rs' Br. 53–54, an epithet that most readers of the Code of Federal Regulations would likely apply to every paragraph. In fact the mandated preparations seem rather basic. If an entity balks at the prospect of keeping a "telephone" and "[p]ortable fire extinguisher[ ]" on site, § 261.410(b)(2)–(3), it may not really belong in the business of handling toxic and inflammable secondary materials. And in practice it may not even have to do that much: EPA stands ready to waive these and other preparedness requirements when they're not necessary. See § 261.410(b), (d), (e).

As we said of the containment requirements, there is some risk that these mandatory precautions might be read unreasonably. For example, the obligation "to minimize the possibility of" accidents might be taken, standing alone, to require all preventive measures no matter the cost. § 261.410(a). But we are satisfied that such a reading would contravene EPA's explanation in the rulemaking, that the rule tests whether the generator intends "to reduce potential loss of valuable hazardous secondary materials." See *Final Rule*, 80 Fed. Reg. at 1,710/2.

B. Administrative Approval Requirements and Remedy

Petitioners focus more persuasively on EPA's abolition of the reasonable efforts option and its replacement with a requirement of a variance for third-party reclamation. Under the Transfer–Based Exclusion, a generator could send materials to any reclaimer it chose, provided that, after making a reasonable investigation, it "affirmatively answer[ed]" five questions about the reclaimer. 40 C.F.R. § 261.4(a)(24)(v)(B) (2014). These asked if the reclaimer (1) was employing a legitimate recycling process; (2) had notified regulators of its operations and its financial stability; (3) had *not* been the subject of recent enforcement actions; (4) had adequate skill and equipment to perform the recycling safely; and (5) had adequate processes for disposing of any residual wastes generated during the recycling. *Id.* The rule required the generator to have met this obligation "in good faith" and to have based its analysis for each question on an "objectively reasonable belief." *2008 Rule*, 73 Fed. Reg. at 64,700/1. A generator that failed to meet that standard could be liable for a RCRA violation. *Id.* at 64,699/3–64,700/1.

The new rule keeps the general framework for evaluating reclaimers but broadens the inquiry and assigns it to

regulators, not the generator. If the reclaimer lacks a RCRA permit or interim status, it must secure a regulatory variance under 40 C.F.R. § 260.31(d) from the EPA Administrator or applicable state regulator. See *Final Rule*, 80 Fed. Reg. at 1,715/1. And the questions, transmogrified into criteria for administrative grant, are expanded to include a sixth, requiring the reclaimer to "address the potential for risk to proximate populations from unpermitted releases of the hazardous secondary material." § 260.31(d)(1)–(6). EPA asserts that this "additional oversight" is required "to ensure that [ ] hazardous secondary material is legitimately recycled and not discarded." *Final Rule*, 80 Fed. Reg. at 1,709/1. Here again, EPA's "good reasons" and its claim for permissibility under the statute overlap, but not as persuasively as with the emergency preparation requirements.

***12** Recall that EPA has a Generator–Controlled Exclusion which is targeted at the same types of material as the Verified Recycler Exclusion: hazardous secondary materials reclaimed in a manner that doesn't qualify for pre–2008 exclusions. EPA insists that these materials generally have little value as recycling inputs, a trait from which one can reasonably infer a greater susceptibility to illegitimate or improper recycling. See *id.* at 1,707/1–2; see also EPA, *Revisions to the Definition of Solid Waste Final Rule Response to Comments Document*, at 77 (Dec. 10, 2014) (the "*Comments Document*") (acknowledging that "high value" secondary materials are less likely to be discarded but arguing that EPA has "already promulgated exclusions for such materials").

But this risk of discarding low-value materials would apply whether the reclamation occurs in-house or externally. And yet while the Generator–Controlled Exclusion and Verified Recycler Exclusion share some conditions, only the latter requires an administrative approval. Industry Petitioners charge that EPA has acted on the basis of an unreasonable presumption that transfer carries an undue risk of discard. Such a presumption would contradict our holding in *Safe Food* that "[a]s firms have ample reasons to avoid complete vertical integration, firm-to-firm transfers are hardly good indicia of a 'discard' " under RCRA. 350 F.3d at 1268 (citation omitted).

EPA counters that its reasoning is more nuanced, that it rests not on transfer alone, but on the confluence of low-value materials and transfer. These factors combine to form "perverse incentives ... to over-accumulate [ ] hazardous secondary materials" without recycling them. *Final Rule*, 80 Fed. Reg. at 1, 708/2; see also *id.* at 1,716/1 (justifying separate exclusion for transferred "spent solvents" because third-party reclaimers have "little economic reason to accumulate" these "higher-value" materials). EPA's theory is certainly more clever than Industry Petitioners give it credit for, but EPA fails to provide sufficient linkage between theory, reality, and the result reached. See *State Farm*, 463 U.S. at 43, 103 S.Ct. 2856 ("[T]he agency must examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.' " (quoting *Burlington Truck Lines v. United States*, 371 U.S. 156, 168, 83 S.Ct. 239, 9 L.Ed.2d 207 (1962))).

EPA's reasoning relies heavily on a theoretical study predicting that when the value of a recycled product is low, or the market for it "weak or unstable," the "acceptance fee" generators pay when off-loading materials "may be an important component of the [reclaimer's] overall revenue." *Market Study* at 18; see also *id.* at 3. EPA asserts that this incentive leads "commercial third party recyclers to maximize the amount of hazardous secondary material they can accept to increase profits," thus creating risks of "over-accumulat[ion]" and "discard." *Final Rule*, 80 Fed. Reg. at 1,752/1. But having found that some types of recycling are typified by transfers of materials low or unstable in value, see *Market Study* at 88–89, and having surmised that those conditions could lead to "market failure," *id.* at 3, the study disclaims any analysis of whether such failures actually occur and to what degree: "limitations on the availability and quality of data prevented us from conducting [ ] empirical tests," *id.* at 43.

EPA is free to rely on theoretical or model-based approaches, as long as that reliance is reasonable in context. As our dissenting colleague points out, Dissent at 10–11, we long ago recognized that "[r]easoned decisionmaking can use an economic model to provide useful information about economic realities, provided there is a conscientious effort to take into account what

is known as to past experience and what is reasonably predictable about the future." *American Public Gas Ass'n v. FPC*, 567 F.2d 1016, 1037 (D.C. Cir. 1977). And more recently, as our colleague also points out, Dissent at 11, we deferred to EPA's use of particle-trajectory modeling when the agency found it to be "particularly illuminating," noted that it was "more precise" in some cases than historical data, and "took reasonable steps to account for [its] limitations," *Mississippi Comm'n on Environmental Quality v. EPA*, 790 F.3d 138, 166–71 (D.C. Cir. 2015). Thus what we seek is some indication of a reasonable concurrence between model and reality. Here the *Market Study* cautions that its hypothesized "sources of market failure," e.g., skewed incentives leading to discard and environmental damage, "do not necessarily correlate directly to observable characteristics of the firm or market." *Market Study* at 48–49. Thus, the study offers EPA reasons (based on seemingly sensible notions of market actors' incentives) to think that the incidence of discard might be somewhat higher in the presence of specific characteristics (e.g., low-value materials and third-party transfer) than in their absence. But it offers no data to support the view that the increased incidence actually exists nor to show how great the increase is. That type of information (or a sufficient explanation for its absence) is quite important in cases such as this, where EPA is determining that an activity nominally outside of its jurisdiction should be banned absent regulatory pre-approval. Thus EPA's reliance on the study, standing alone, does not provide a sufficient basis for the administrative approval provisions.

***13** EPA claims to have the necessary support in its *Problems Study*, a document whose faults we've already discussed. Of the study's 250 instances of recycling gone awry, 238 involved third-party recycling as opposed to on-site recycling. *Problems Study* at 8. Based on these "easy to find" cases, *id.* at 4, EPA inferred that discard could occur under the old Transfer–Based Exclusion unless "additional oversight" was imposed, *Final Rule*, 80 Fed. Reg. at 1, 708/2. But far from confirming the *Market Study*'s assumptions, the *Problems Study* is even more tentative in its treatment of third-party recycling. It cautions that the greater proportion of problems at off-site recyclers might be because "on-site recycling is simply a less common practice." *Problems Study* at 8. (The study made no effort to explain how the proportions of on-site and off-site reclamation in the examples reviewed matched those of the real world.)

From the study, EPA concluded that "the vast majority of environmental damages—approximately 94%—occur at off-site commercial recyclers." *Final Rule*, 80 Fed. Reg at 1,699/2. But by focusing only on recycling gone wrong, that statistic tells us nothing about such episodes' overall likelihood in any particular setting. Compare Dissent at ———–———. The dissent offers a helpful example: imagine that 94% of plane crashes are associated with Airline A; can we say that this airline is less safe than its competitors? Dissent at ——. Before we can land at that conclusion, we'd need first to know something about the distribution of flights among airlines. If Airline A performs 94% of the set of flights that happened to be studied, its crash-percentage would seem decidedly average. Compare *Problems Study* at 8 (noting that on-site recycling may be "less common"). Or maybe Airline A flies only the most dangerous routes. Context gives clues. The *Problems Study* leaves us grasping.

After commenters attacked EPA's interpretation of this study, EPA responded that because most recyclers lack any duty to notify regulators, the agency does not have access to better data about recycling practices. *Final Rule*, 80 Fed. Reg. at 1,740/3–41/1–2. Indeed, we commonly "defer to an agency's decision to proceed on the basis of imperfect scientific information, rather than to invest the resources to conduct the perfect study." *Cablevision Sys. Corp. v. FCC*, 649 F.3d 695, 717 (D.C. Cir. 2011) (internal quotation marks omitted). But limited data do not justify unlimited inferences. Agency reliance on imperfect information makes sense only where that information supports the agency action.

The *Market Study* and *Problems Study* at most support a belief, carried over from the Transfer–Based Exclusion, that third-party reclaimers present distinct risks compared to on-site reclaimers. These risks would accordingly justify special conditions, such as the variance criteria for which the Generator–Controlled Exclusion has no analogue. The first five of these criteria, which petitioners do not challenge, seem properly focused on whether the third-party reclaimer has the inclination and ability to recycle legitimately. See 40 C.F.R. § 260.31(d)(1)–(5). (We cannot readily say the same of the sixth, discussed below.)

But the imposition of a requirement of advance administrative approval cannot be justified merely on the differences that EPA has identified between on-site and third-party reclamation. EPA must explain why the risk that purported third-party recyclers will in reality "discard" the materials is so high that reclamation under the Verified Recycler Exclusion may only proceed on the basis of prior agency approval. On this key aspect of third-party reclamation, EPA's *Problems* and *Market* studies say nothing useful.

EPA invokes yet another study, *An Assessment of Good Current Practices for Recycling of Hazardous Secondary Materials* (Nov. 22, 2006). This analysis, performed before adoption of the Transfer–Based Exclusion, discussed the extent to which generators voluntarily audited their third-party recyclers to ensure that "their materials are not mishandled." *Id.* at 7. The study found that "auditing is being practiced by many responsible companies" but that "small generators do not audit as regularly as larger customers" and that smaller generators' audits may not be as thorough. *Id.* at 20. In 2008, EPA evidently did not find much alarm in this data; it made the reasonable efforts option available for small and large generators alike. By 2015, EPA was less sanguine about the study's results, warning that "many smaller generators would not have the technical expertise or resources to" adequately assess third-party reclaimers. See *Final Rule*, 80 Fed. Reg. at 1,711/3 & n.17. EPA is free to reasonably revise its interpretation of that study, but even this updated reasoning cannot support the *Final Rule*. EPA admits in the rulemaking that "many large companies do conduct environmental audits of recycling facilities." *Id.* at 1,711/3. A risk that some smaller generators would misapply the reasonable efforts option does not explain why EPA should treat larger generators as prone to making inadequate assessments.

***14** Along with their challenge to the variance procedure, Industry Petitioners also claim that the sixth variance criterion is, in substance, vague and unreasonable. This criterion involves something of a "cumulative" nuisance standard; it requires third-party reclaimers to account for how any "unpermitted releases" from their facilities might combine with "other nearby potential stressors" to create "risk[s] to proximate populations." 40 C.F.R. § 260.31(d)(6). The more environmental problems there already are in an area—such as "other industrial facilities, landfills, transportation-related air emissions, poor housing conditions (*e.g.*, lead-based paint), leaking underground tanks, pesticides, and incompatible land uses"—the less appropriate it might be for the reclaimer to add yet another stress. See *Final Rule*, 80 Fed. Reg. at 1,714/3–15/1.

Thus the criterion *assumes* discard, i.e., behavior regulable under RCRA, and seeks to constrain its environmental impact, rather than testing for discard's existence. It identifies one of the many *problems related to waste disposal*, but not whether the reclaimer is actually contributing to *the waste disposal problem*. Were we dealing with materials that were lawfully identified as hazardous waste, this test might be valid for some purposes. But the Verified Recycler Exclusion covers materials that might be labeled waste only because of a reclamation-equals-discard rule that EPA has all but conceded is overbroad. *Id.* at 1,708/3. This criterion therefore cannot stand as a means of identifying discard.

As for remedy, Industry Petitioners ask that we keep the Verified Recycler Exclusion in place while removing its objectionable provisions. They seek this remedy because not all of the *Final Rule*'s changes were to their detriment. Whereas the Transfer–Based Exclusion disqualified spent catalyst generators from relying on it, 40 C.F.R. § 261.4(a)(24)(iii) (2014) (spent catalysts referenced as K171 and K172), the Verified Recycler Exclusion removed that bar. As at least one of petitioners' members is a spent catalyst generator, an unalloyed return to the Transfer–Based Exclusion would be for it a hollow victory.

We will "sever[ ] and affirm[ ] [ ] a portion of an administrative regulation" only when we can say without any " 'substantial doubt' that the agency would have adopted the severed portion on its own." *New Jersey v. EPA*, 517 F.3d 574, 584 (D.C. Cir. 2008) (internal quotation marks omitted). Thus we have severed provisions when "they operate[d] entirely independently of one another." *Davis Cty. Solid Waste Mgmt. v. EPA*, 108 F.3d 1454, 1459 (D.C. Cir. 1997). Here, though, we are not sure that EPA's regulatory and deregulatory efforts were wholly independent. The rulemaking shows that EPA entertained two different options for removing

the spent catalyst bar: first as part of the plan to repeal the Transfer–Based Exclusion entirely and replace it with "alternative Subtitle C regulat[ions]" for which "spent catalysts would be eligible," *Proposed Rule*, 76 Fed. Reg. at 44,141/3 & n.54; second as part of the Verified Recycler Exclusion that EPA adopted, *Final Rule*, 80 Fed. Reg. at 1,738/1. At no point in the record does EPA propose keeping the Transfer–Based Exclusion and repealing its spent catalyst disqualifier.

Would EPA have so proposed had it known the Verified Recycler Exclusion would be vacated? There is some evidence pointing in that direction, but doubts remain. EPA explained that its spent catalyst decision was due in large part to changes to the "contained" standard at 40 C.F.R. § 260.10; these revisions addressed the risk of fire that originally led EPA to bar spent catalysts. See *Final Rule*, 80 Fed. Reg. at 1,738/1. EPA also removed the spent catalyst disqualifier from the Generator–Controlled Exclusion, which is generally less restrictive than the Verified Recycler Exclusion. See *id.* These facts suggest that EPA might have removed the disqualifier absent the other changes in the Verified Recycler Exclusion. But when commenters attacked EPA's proposal to remove the spent catalyst bar and advocated a more stringent approach, EPA responded that, to fulfill the goal of allowing only legitimate recycling, there was no need to impose the suggested "additional conditions." *Comments Document* at 265–66. EPA's answer assumed that that the new Verified Recycler Exclusion and the new containment standard were together sufficient to regulate transferred spent catalysts. We cannot clearly infer what EPA would have done absent that exclusion.

***15** The only changes in the Verified Recycler Exclusion that we can sever without any "substantial doubt" are the emergency preparedness requirements, 40 C.F.R. § 261.4(a)(24)(v)(E), which are as we explained lawful, and an expanded containment requirement, § 261.4(a)(24)(v)(A), which was not challenged. These new provisions address some of EPA's perceived "regulatory gaps" in the Transfer–Based Exclusion, *Final Rule*, 80 Fed. Reg. at 1,706/3, and they do not depend on any vacated portions of the Verified Recycler Exclusion. On remand, EPA can of course renumber its rules as necessary to accommodate the returning Transfer–Based Exclusion provisions.

EPA has not commented on the requested remedy, probably because the remedy section in Industry Petitioners' opening brief was quite confusing, and their desire to sever and affirm was made evident only in their reply. If EPA, or any party, wishes to disabuse us of our substantial doubt with a petition for rehearing, we will of course reconsider as necessary. See *MD/DC/DE Broadcasters Ass'n v. FCC*, 253 F.3d 732, 740 (D.C. Cir. 2001) (citing *Virginia v. EPA*, 116 F.3d 499, 500–01 (D.C. Cir. 1997)).

Having concluded that the Verified Recycler Exclusion is unreasonable, we need not address Environmental Petitioners' argument that the exclusion is too lenient.

IV. Remaining Challenges by Industry Petitioners

Industry Petitioners have two remaining challenges. The first is that EPA cannot subject spent catalysts to the Verified Recycler Exclusion. The second is that EPA cannot treat off-specification commercial chemical products as secondary materials. The first is rendered moot by our restoration of the Transfer–Based Exclusion, and no more needs to be said about it here. The second is also outside our jurisdiction, but for reasons requiring more explanation.

During the rulemaking, a commenter asked EPA to confirm that commercial chemical products are not "hazardous secondary material[s]" as that class is defined in 40 C.F.R. § 260.10. *Comments Document* at 313. EPA answered, much to Industry Petitioners' chagrin, that "a commercial chemical product listed in 40 CFR 261.33 could be considered a hazardous secondary material if it is off-specification or otherwise unable to be sold as a product." *Id.* at 314; see Industry Pet'rs' Br. 58–65. The question and EPA's answer concern an issue that is antecedent to the *Final Rule*'s definition of discarded hazardous waste. The rule identifies when secondary materials become waste as a result of being sham recycled, but that delineation necessarily builds on prior law and regulations governing when materials are secondary. We cannot assess EPA's statement on that subject unless we can find the issue within our original jurisdiction, which

is limited to actions by EPA "promulgating" regulations, etc. 42 U.S.C. § 6976(a)(1).

Tellingly, the comment and EPA's response are interpreting provisions in 40 C.F.R. § 260.10 and § 260.33 that were left untouched by the *Final Rule*. See *Comments Document* at 313–14. Because of the limits on our jurisdiction, we cannot entertain the claim unless EPA's statement was more than just an interpretation of a prior rule; it must interpret part of the *Final Rule* or be itself an effective "legislative rule." See *Cement Kiln Recycling Coal. v. EPA*, 493 F.3d 207, 226 (D.C. Cir. 2007). Industry Petitioners' allegation, though, is that EPA's response abandoned a prior policy, embodied largely in guidance materials, without properly recognizing that change. Industry Pet'rs' Br. 64–65. Such a challenge is properly before the district court, not this tribunal (Industry Petitioners make no claim of pendent jurisdiction). See 42 U.S.C. § 6976(a)(1). We express no opinion on when EPA may consider commercial chemical products to be secondary materials.

V. Challenges by Environmental Petitioners

***16** Environmental Petitioners challenge EPA's approach to the pre–2008 exclusions. As noted above, before 2008, EPA had promulgated 32 exclusions from the definition of solid waste—that is, it had exempted 32 different materials, products, or processes from Subtitle C regulation. In its *Proposed Rule*, EPA proposed subjecting facilities that qualified for these exclusions to four new requirements, three of which are relevant here: legitimacy, containment, and notification. 76 Fed. Reg. at 44,138/3–39/1–2. The proposed legitimacy condition set forth the factors that facilities had to satisfy in order to prove they are engaged in legitimate, rather than sham, recycling. Under the proposed containment condition, facilities had to store all hazardous secondary materials in units that meet certain safety, quality, and labeling criteria. *Id.* at 44,140/1. And the proposed notification condition obligated regulated parties periodically to submit information to EPA so that the agency could monitor compliance. *Id.* at 44,140/1–2. EPA based these conditions on a study of environmental damage cases involving hazardous waste (an earlier version of the *Problems Study*) and EPA's finding that most of cases in that study were associated with secondary materials exempted under a pre–2008 exclusion. *Id.* at 44,138/1–2.

In the final rule, however, EPA opted to apply only the legitimacy condition to all pre–2008 exclusions and deferred a decision about whether to do the same with containment and notification. Specifically, EPA stated that it was "deferring action on applying the contain[ment] [and notification] standard[s] to the pre–2008 exclusions and exemptions until [it could] more adequately address commenters' concerns." *Final Rule*, 80 Fed. Reg. at 1,766/2–3. Commenters had raised unanticipated objections, EPA explained, regarding the difficulties of implementing a universal containment provision and the burdens imposed by a notification requirement. *Id.*

Environmental Petitioners take issue with EPA's decision to defer action on containment and notification. Drawing on language from the *Proposed Rule*, they argue that EPA fundamentally changed its position without explanation: whereas the agency originally viewed containment and notification as "minimum requirements necessary to define when recycled hazardous secondary materials are not discarded," 76 Fed. Reg. at 44,138/3–39/1, it ultimately determined that containment and notification conditions were expendable. This unexplained reversal, Environmental Petitioners contend, was arbitrary and capricious.

We need not—indeed cannot—reach the merits of this challenge. RCRA's judicial review provision vests this court with exclusive power to review "action[s] of the Administrator in promulgating any regulation, or requirement under this chapter or denying any petition for the promulgation, amendment or repeal of any regulation under this chapter." 42 U.S.C. § 6976(a)(1). This provision gives us jurisdiction over only "three types of actions by EPA: promulgation of final regulations, promulgation of requirements, and the denial of petitions for the promulgation, amendment or repeal of RCRA regulations." *API I*, 216 F.3d at 68; see *Molycorp, Inc. v. EPA*, 197 F.3d 543, 545 (D.C. Cir. 1999) (characterizing 42 U.S.C. § 6976(a)(1) as "a limitation on our jurisdiction"). Critically here, we have held that "[a] decision by an agency to defer taking action is not

a final action reviewable [under RCRA]." *API I*, 216 F.3d at 68; see also *American Portland Cement Alliance v. EPA*, 101 F.3d 772, 777 (D.C. Cir. 1996). Because EPA expressly stated that it was deferring action on applying containment and notification conditions to the pre–2008 exclusions, we lack jurisdiction to review Environmental Petitioners' claim.

Environmental Petitioners resist this straightforward jurisdictional analysis. Citing *Montana v. Clark*, 749 F.2d 740 (D.C. Cir. 1984), and *Appalachian Power Co. v. EPA*, 208 F.3d 1015 (D.C. Cir. 2000), they argue that we may review EPA's decision to defer. But neither of these cases construes RCRA's judicial review provision. See *Appalachian Power Co.*, 208 F.3d at 1020–22 (interpreting the Clean Air Act's judicial review provision); *Clark*, 749 F.2d at 744 (interpreting the Administrative Procedure Act). And even if they did, those cases are easily distinguished. Whether we have authority to review an agency's express *rejection* of a request to amend longstanding regulations, *Clark*, 749 F.2d at 744, is irrelevant where, as here, EPA has merely *deferred*—rather than rejected—a particular action. Moreover, although "[t]he fact that a law may be altered in the future has nothing to do with whether it is subject to judicial review at the moment," *Appalachian Power Co.*, 208 F.3d at 1022, we lack jurisdiction to review EPA's deferred action not because EPA could change its mind down the road, but because it has yet to make up its mind in the first place.

***17** Alternatively, Environmental Petitioners contend that we have jurisdiction over their challenge because EPA "reopened" comment on the pre–2008 exclusions and then declined to revise them. Environmental Pet'rs' Br. 43. The reopener doctrine "permits a plaintiff to bring an otherwise-stale challenge.... when an agency has considered substantively changing a rule but ultimately *declined* to do so." *Mendoza v. Perez*, 754 F.3d 1002, 1019 n.12 (D.C. Cir. 2014). Environmental Petitioners' reopener argument falters for a simple reason: the doctrine has no applicability to this case because EPA never considered changing the *substance* of the pre–2008 exclusions. As it stated in the *Proposed Rule*, EPA was "not reopening comment on any substantive provisions of the regulatory exclusions or exemptions," but rather was proposing legitimacy, containment, and notification requirements "as means to better enforce the regulations." 76 Fed. Reg. at 44,138/3.

Of course, nothing in our conclusion forecloses judicial review of EPA's inaction once and for all. Environmental Petitioners may petition EPA to promulgate a rule imposing containment and notification conditions and, if their petition is denied, seek review in this court. See 42 U.S.C. § 6976(a)(1) (granting jurisdiction to review denials of rulemaking petitions). We conclude only that Environmental Petitioners are barred from obtaining review in the manner they now seek. And because we dispose of their challenge by concluding that we are without statutory jurisdiction, we have no reason to address Industry Intervenors' contention that Environmental Petitioners lack Article III standing. See *Sinochem International Co. Ltd. v. Malaysia International Shipping Corp.*, 549 U.S. 422, 431, 127 S.Ct. 1184, 167 L.Ed.2d 15 (2007) (holding that "there is no mandatory 'sequencing of jurisdictional issues' " and that "a federal court has leeway 'to choose among threshold grounds for denying audience to a case on the merits' " (quoting *Ruhrgas AG v. Marathon Oil Co.*, 526 U.S. 574, 584–85, 119 S.Ct. 1563, 143 L.Ed.2d 760 (1999))).

VI. Conclusion

The *Final Rule* is upheld in part and vacated in part as consistent with this opinion. Briefly put: Factor 3 is upheld; Factor 4 is vacated insofar as it applies to all hazardous secondary materials via § 261.2(g); the Verified Recycler Exclusion is vacated except for its emergency preparedness provisions and its expanded containment requirement; and the Transfer–Based Exclusion is reinstated. As a consequence of the latter, the removal of that exclusion's bar on spent catalysts is vacated, subject, as we noted above, to such arguments as parties may raise supporting a different outcome.

So ordered.

Tatel, Circuit Judge, dissenting from Parts II.B and III.B:

In the mid–1970s, as industrial and technological developments spurred the national economy, the United States faced "a rising tide of scrap, discarded, and waste materials." 42 U.S.C. § 6901(a)(2). This mounting waste caused "serious financial, management, intergovernmental, and technical problems," *id.* § 6901(a)(3), and posed a grave threat "to human health and the environment," *id.* § 6901(b)(5). In response, Congress passed the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6901–6992k, a comprehensive scheme "to regulate hazardous wastes from cradle to grave in accordance with ... rigorous safeguards and waste management procedures," *Chicago v. Environmental Defense Fund*, 511 U.S. 328, 331, 114 S.Ct. 1588, 128 L.Ed.2d 302 (1994). Through RCRA, and central to this case, Congress sought to *prevent* environmental harm by ensuring that hazardous waste was "properly managed in the first instance thereby reducing the need for corrective action at a future date." 42 U.S.C. § 6902(a)(5).

Congress gave the Administrator of the Environmental Protection Agency (EPA) broad authority to effectuate this goal. *See id.* § 6912. Selected by the President and confirmed by the Senate for his or her expertise in environmental issues, the Administrator may promulgate "such regulations as are necessary to carry out his [or her] functions." *Id.* § 6912(a)(1). The judiciary, by contrast, has a limited role under RCRA. When reviewing rules issued by the Administrator, the courts, lacking environmental expertise and political accountability, are bound by two fundamental principles of judicial restraint.

***18** First, because RCRA provides for review "in accordance with" the Administrative Procedure Act, *id.* § 6976(a), a reviewing court's task is to ask only whether the rule is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law," 5 U.S.C. § 706(2)(A). As the Supreme Court has made clear, once a court is satisfied that EPA is acting within its delegated authority, the "scope of [judicial] review under the 'arbitrary and capricious' standard is narrow." *Motor Vehicle Manufacturers Association of the United States v. State Farm Mutual Automobile Insurance Co.*, 463 U.S. 29, 43, 103 S.Ct. 2856, 77 L.Ed.2d 443 (1983). Courts are "not to ask whether a regulatory decision is the best one possible or even whether it is better than the alternatives." *FERC v. Electric Power Supply Association*, —— U.S. ——, 136 S.Ct. 760, 782, 193 L.Ed.2d 661 (2016). This is especially true where, as here, agency action involves "a high level of technical expertise," *Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 377, 109 S.Ct. 1851, 104 L.Ed.2d 377 (1989) (quoting *Kleppe v. Sierra Club*, 427 U.S. 390, 412, 96 S.Ct. 2718, 49 L.Ed.2d 576 (1976) (internal quotation mark omitted)), and "predictive judgments about areas that are within the agency's field of discretion," *BNSF Railway Co. v. Surface Transportation Board*, 526 F.3d 770, 781 (D.C. Cir. 2008) (quoting *Wisconsin Public Power, Inc. v. FERC*, 493 F.3d 239, 260 (D.C. Cir. 2007)).

Second, when reviewing facial challenges to a rule—again as here—courts are required to assess the rule's validity across a broad spectrum of applications; they are not to imagine whether the rule might be arbitrary in "uncommon particular applications," which, of course, can be challenged later should they arise. *EPA v. EME Homer City Generation, L.P.*, —— U.S. ——, 134 S.Ct. 1584, 1609, 188 L.Ed.2d 775 (2014). As Congress well knew when it authorized pre-enforcement facial review of RCRA rules, *see* 42 U.S.C. § 6976(a)(1), the fact that a petitioner—or for that matter a judge—"can point to a hypothetical case in which the rule might lead to an arbitrary result does not render the rule 'arbitrary or capricious,' " *American Hospital Association v. NLRB*, 499 U.S. 606, 619, 111 S.Ct. 1539, 113 L.Ed.2d 675 (1991).

In this case, EPA promulgated a rule defining when hazardous materials qualify as "discarded" and thus may be subjected to RCRA's rigorous protections. The court never questions the Administrator's statutory authority to issue the *Final Rule*, but nonetheless invalidates two of its critical features: Factor 4 of the legitimacy test, which distinguishes genuine from sham recycling; and the verified recycler exclusion, which ensures that companies claiming to recycle hazardous waste in fact do so. In reaching this result, the court displays a level of scrutiny that I believe conflicts with the APA's highly deferential standard of review and with the principles governing judicial review of facial challenges to rules. As a result, the court has deprived the public of two safeguards that the Administrator, exercising her statutory authority under RCRA, reasonably believed were needed to protect "human health and the environment." 42 U.S.C. § 6901(b)(5). I respectfully dissent.

I.

Factor 4 of the legitimacy test targets sham recyclers that incorporate hazardous materials into recycled products in order to avoid proper recycling or disposal. It does so by requiring that the product of a recycling process "be comparable to a legitimate product or intermediate." 40 C.F.R. § 260.43(a)(4). This approach makes sense: as the Administrator explained, "high levels of hazardous constituents" in an allegedly recycled product "could indicate that the recycler incorporated hazardous constituents into the final product when they were not needed to make that product effective." 80 Fed. Reg. 1,726. The *Final Rule* offers recyclers three alternative avenues for demonstrating compliance with Factor 4.

First, subparagraph (i) addresses recycled products that have raw analogues. Such products satisfy Factor 4 if they (A) "do[ ] not exhibit a hazardous characteristic ... that analogous products do not exhibit" and (B) contain comparable concentrations of hazardous constituents or hazardous-constituent levels that meet widely used commodity standards. 40 C.F.R. § 260.43(a)(4)(i). In my view, this subparagraph rationally effectuates Factor 4's general approach. EPA inferred that if a recycled product contains more hazardous constituents or properties than its raw analogue, sham recycling has occurred. 80 Fed. Reg. 1,727. Why else would those hazardous constituents or properties be present? By way of example, EPA pointed to paint made from recycled hazardous materials. If such paint contains significant amounts of cadmium (a hazardous constituent), but the same type of paint made from raw materials contains no cadmium, such a disparity "could indicate that the cadmium serves no useful purpose and is being passed through the recycling process and discarded in the product." *Id.*

***19** We validated an almost identical technical judgment by the Administrator in *Safe Food and Fertilizer v. EPA*, 350 F.3d 1263 (D.C. Cir. 2003). Under the rule in that case, certain recycled materials were deemed non-discarded when (1) market participants treated them "more like valuable products than like negatively-valued wastes" and (2) "the [products] derived from the recycled [materials were] chemically indistinguishable from analogous commercial products made from virgin materials." *Id.* at 1269. In essence, this rule exempted materials from regulation based on their compliance with criteria that, like Factors 3 and 4, assess whether recyclers treat materials as valuable commodities and generate products chemically indistinguishable from analogous products. We held that these two factors, in conjunction, represented a "reasonable tool for distinguishing products from wastes." *Id.* As to the "identity principle"—subparagraph (i)'s counterpart—the court reasoned that where a recycled product is "indistinguishable in the relevant respects" from the analogous "virgin" product, it is "eminently reasonable" to treat both as "products rather than wastes." *Id.*

In spite of *Safe Food*, this court concludes that subparagraph (i) is too "imprecis[e]" to be reasonable. Maj. Op. at ——. In its view, some legitimately recycled products may contain "some small excess of hazardous constituents," and the presence of those hazardous materials "would not constitute a reasonable basis for dubbing the product or the process a sham." *Id.* But subparagraph (i) does not simply target products with "some small excess of hazardous constituents." Rather, it targets products with significantly more hazardous constituents or properties than an analogous raw product, *i.e.*, beyond "a small acceptable range" of difference. 80 Fed. Reg. 1,727. The Administrator explained: "If a product produced with hazardous secondary material exhibited a characteristic of hazardous waste that an analogous product did not exhibit, this would be an indication that sham recycling could be occurring as a *significant* hazardous constituent or characteristic would be in the product only as a result of the recycling of the hazardous secondary material." *Id.* (emphasis added).

Perhaps the presumption underlying subparagraph (i) does suffer from some "imprecision." Maj. Op. at ——. Yet because Industry Petitioners have mounted a facial attack on the *Final Rule*, this court has no authority to conjure up "hypothetical case[s] in which the rule might lead to an arbitrary result." *American Hospital Association*, 499 U.S. at 619, 111 S.Ct. 1539. Where, as here, the Administrator's presumption of sham recycling based on elevated levels of hazardous constituents is

reasonable across most applications, we must uphold it. *Id.* If someday the Administrator applies the rule to a recycler in an arbitrary and capricious manner—for instance, as the court fears, by selecting an unreasonably "small acceptable range of difference," *see* Maj. Op. at ———that recycler "may bring a particularized, as-applied challenge to the [rule]," *EME Homer City Generation*, 134 S.Ct. at 1609.

The court's analysis of subparagraph (i) suffers from a second defect. Whether the presence of hazardous constituents provides sufficient evidence of sham recycling is exactly the type of technical judgment that RCRA delegates to the Administrator. Of course, the Administrator "must examine the relevant data and articulate a satisfactory explanation for its action." *State Farm*, 463 U.S. at 43, 103 S.Ct. 2856. The court, however, never questions the Administrator's compliance with these two requirements. Instead, it second guesses the Administrator's "predictive judgments," *BNSF Railway Co.*, 526 F.3d at 781, about a matter—the precise level of hazardous constituents needed to demonstrate sham recycling—that "requires a high level of technical expertise" to which "we must defer," *Marsh*, 490 U.S. at 377, 109 S.Ct. 1851.

Subparagraph (ii), which applies when a recycled product has no raw analogue, offers recyclers a second way to show compliance with Factor 4. These products qualify as legitimate if they "meet[ ] widely recognized commodity standards and specifications" or if "[t]he hazardous secondary materials being recycled are returned to the original process ... from which they were generated." 40 C.F.R. § 260.43(a)(4)(ii).

***20** The court concedes that subparagraph (ii) is reasonable, *see* Maj. Op. at —— – ——, and for good reason. The *Final Rule* describes the agency's efforts to address commenters' concerns that in many cases of legitimate recycling "there may not be an analogous product with which a facility can compare the product of the recycling process." 80 Fed. Reg. 1,728. In response to these concerns, as well as other comments supporting an approach focused on commodity standards and closed-loop recycling, the Administrator carved out "recycling processes that [are] designed to use a specific hazardous secondary material to make a useful product and processes that always incorporate[ ] a hazardous secondary material back into the generating process during manufacturing." *Id.*

Finally, subparagraph (iii)—a catchall for recyclers unable to comply with subparagraphs (i) or (ii)—allows recyclers to demonstrate legitimacy by showing either a "lack of exposure from ... or bioavailability of ... toxics" in the product. 40 C.F.R. § 260.43(a)(4)(iii). Even if they fail to make either showing, moreover, recyclers can still demonstrate legitimacy by pointing to any "other relevant considerations" showing that the product does not "pose a significant human health or environmental risk." *Id.* To make these showings, recyclers must "prepare documentation," including a "certification statement that the recycling is legitimate," which "must be maintained on-site for three years after the recycling operation has ceased." *Id.*

Although the court acknowledges that subparagraph (iii) reasonably draws the line between recycling and discard through a perspective based on health and environmental risks, Maj. Op. at —— (citing *Safe Food*, 350 F.3d at 1269–70), it nonetheless concludes that subparagraph (iii) "falls short of saving the rule, due to the draconian character of the procedures it imposes on recyclers," namely, the requirement to prove legitimacy by preparing and maintaining "paperwork," *id.* at ——–——.

For their part, however, Industry Petitioners never argue that the rule's paperwork obligations are too rigorous. This is understandable. If subparagraph (iii) qualifies as draconian, then so too would countless other run-of-the-mill requirements that entities file applications and keep certificates on hand: like those for pilots, *see* 14 C.F.R. § 61.3; *id.* § 61.123, elevator operators, *see* D.C. MUN. REGS. tit. 12, § 3010A–3011A, and businesses selling alcohol, *see* D.C. CODE § 25–401; *id.* § 25–711, just to name a few. Not even the procedures for gaining and maintaining admission to the District of Columbia Bar would pass muster, as they require candidates to prepare a character and fitness application and certify completion of a mandatory course on professional conduct. *See* D.C. COURT OF APPEALS R. 46; D.C. BAR BYLAWS, R. 2.

In any event, the court's conclusion runs headlong into precedent. In *American Chemistry Council v. EPA*, 337 F.3d 1060 (D.C. Cir. 2003), we considered a challenge to an EPA rule that presumed certain mixtures and derivatives of waste were "hazardous" and thus subject to regulation, yet permitted regulated entities to show otherwise. Upholding this rule, we concluded that the Administrator acted reasonably in "[p]lacing the burden upon the regulated entity to show the lack of a hazardous characteristic." *Id.* at 1065. This burden-shifting approach, we determined, alleviated unmanageable administrative obligations for the agency and comported with RCRA's command to "err on the side of caution." *Id.* at 1065–66.

Subparagraph (iii) works just like the rule we approved in *American Chemistry Council*. If a recycler is unable to satisfy subparagraph (i) or (ii), it is a presumptive sham recycler. Subparagraph (iii) then allows the recycler to prove otherwise by making the requisite showings through documentation. If anything, the rule here is more lenient than the one in *American Chemistry Council* because subparagraph (iii) provides for a "self-implementing certification process," 80 Fed. Reg. 1,730, rather than a "cumbersome ... delisting process," *American Chemistry Council*, 337 F.3d at 1065.

***21** According to the court, the *Final Rule* is unlike the one in *American Chemistry Council* because the Administrator never demonstrated that recyclers failing to meet subparagraph (i) are presumptively discarding. Maj. Op. at —— – ——. At bottom, then, the court's critique of subparagraph (iii) traces back to its conclusion that subparagraph (i) (and only subparagraph (i)) does not reasonably distinguish legitimate from sham recycling. But contrary to the court's view, EPA cogently explained why subparagraph (i) is reasonable across most applications, adding subparagraph (iii) only given the possibility that "there may still be instances where recycling is legitimate, but is unable to meet" subparagraph (i) or (ii). 80 Fed. Reg. 1,729. Subparagraph (iii) thus serves as a catchall provision designed to give industry even more "flex [ibility]," *id.*, not as a tacit acknowledgment that subparagraph (i) is deficient, *contra* Maj. Op. at ——. Rather than "substitute [its] own judgment for that of [EPA]," this court should defer to the agency's technical and policy decisions. *Electric Power Supply Association*, 136 S.Ct. at 782.

II.

The key difference between the verified recycler exclusion and its predecessor—the transfer-based exclusion—is that the new rule shifts oversight of off-site recyclers from the industry to the Administrator. 80 Fed. Reg. 1,709. Whereas before waste generators audited off-site recyclers to ensure their legitimacy, now the Administrator or a state authority issues a variance confirming that a recycler's practices are sound. *Id.* at 1,695.

The court never questions the Administrator's authority to promulgate this rule. Instead, invoking a single line from *Safe Food*—"firm-to-firm transfers are hardly good indicia of a 'discard,' " 350 F.3d at 1268—the court concludes that the Administrator had no basis for finding that transferred hazardous materials "carr[y] an undue risk of discard," Maj. Op. at ——.

Safe Food, however, held only that transferred materials are not *automatically* discarded simply because they are sent off-site. As we explained, although "we have never said that RCRA compels the conclusion that material destined for recycling in another industry is necessarily 'discarded,' " the statute "does not preclude application of RCRA to such materials if they can reasonably be considered part of the waste disposal problem." *Safe Food,* 350 F.3d at 1268. The verified recycler exclusion is consistent with *Safe Food*: it defines transferred materials as discarded if—and only if—the off-site recycler receiving the materials fails to meet certain criteria, which carefully discern whether allegedly recycled materials "can reasonably be considered part of the waste disposal problem." *Id.*

This approach finds ample support in the administrative record. When designing the verified recycler exclusion, the Administrator relied on multiple sources, including a report on market forces in the recycling industry and a study of the environmental problems associated with recycling hazardous secondary materials. 80 Fed. Reg. 1,707. The first of these, the market study,

concluded that off-site commercial recyclers, which generate revenue primarily by receiving hazardous materials, have "economic incentives to accumulate waste beyond their ability to deal with it." *Id.* The second report, the problems study, found that of 208 cases in which hazardous waste recycling led to serious environmental damage, 94 percent were attributable to "off-site third-party recyclers." *Id.*

In the court's view, neither study justifies the rule. Although not impugning the market study on its merits, the court rejects it as lacking empirical analysis. But no rule of administrative law bars agencies from relying on studies that use economic models to assess market incentives. In fact, EPA often relies on theoretical models—that is, studies without corroborating "data," Maj. Op at ———and our court has long held that "[r]easoned decisionmaking can use an economic model to provide useful information about economic realities." *American Public Gas Association v. FPC*, 567 F.2d 1016, 1037 (D.C. Cir. 1977); *see also Mississippi Commission on Environmental Quality v. EPA,* 790 F.3d 138, 171 (D.C. Cir. 2015) ("EPA's application, interpretation and modification of [predictive] modeling [to set emissions standards] plainly fall 'within its technical expertise' and thus we owe it 'an extreme degree of deference.' " (quoting *ATK Launch Systems, Inc. v. EPA*, 669 F.3d 330, 338 (D.C. Cir. 2012))).

***22** At any rate, the problems study provides plenty of empirical support for the conclusion that off-site recycling leads to discard. It surveyed cases since 1982 in which recyclers contaminated the environment by discarding hazardous waste, poisoning soil and groundwater "with remediation costs in some instances in the tens of millions of dollars." 80 Fed. Reg. 1,707. To identify these cases, EPA reviewed scores of sources, including the Superfund National Priorities List, national and state databases, comments from at least three different rulemakings, media reports, and information gleaned from contacts in EPA regional offices and state agencies. *See* EPA OFFICE OF RESOURCE CONSERVATION AND RECOVERY, AN ASSESSMENT OF ENVIRONMENTAL PROBLEMS ASSOCIATED WITH RECYCLING OF HAZARDOUS SECONDARY MATERIALS 4 (2014). This thorough canvassing revealed that a full 94 percent of cases involving serious environmental damage could be attributed to off-site recycling.

The court condemns the problems study for "focus[ing] only on recycling gone wrong." Maj. Op. at ——. As a result, the court reasons, the study "tells us nothing" about the relative risks of off-site recycling or the total damage caused by off-site recyclers. *Id.* But this focuses on the wrong question. As the Administrator recognized, the salient question is not what percentage of all off-site recycling damages the environment, but rather what portion of serious damage from hazardous waste disposal is caused by off-site recyclers. The core issue here is whether EPA may target the very companies (off-site recyclers) most responsible for environmental damage. Given the agency's statutory obligation to prevent environmental harm from discarded hazardous waste, I see no reason why it cannot. Accordingly, that some off-site recycling is safe or that serious environmental damage is relatively unusual is beside the point.

Consider this issue in a different context. If there were 208 plane crashes and 94 percent were linked to one carrier, it would be eminently reasonable for an agency tasked with preventing plane crashes to require that carrier to demonstrate that its practices were safe, no matter how many flights the carrier completed or what percentage of total flights it performed. *Contra* Maj. Op. at ——–——. No one would argue that it was unreasonable to regulate the carrier because only a small percentage of its total flights crashed. Yet this court's approach would yield just that result.

In the end, the fundamental problem with the court's conclusion—that the Administrator needs more proof that off-site recycling is unsafe before requiring a variance —is that the court decides for itself a policy question Congress left to the Administrator. RCRA envisions a careful balance of authority between EPA and this court. Today the court upsets that balance.

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