

**United States Court of Appeals,
Fifth Circuit.
CORROSION PROOF FITTINGS, et al., Petitioners,
v.**

**The ENVIRONMENTAL PROTECTION AGENCY and William K. Reilly, Administrator,
Respondents.
No. 89-4596.**

Oct. 18, 1991.

On Motion for Clarification Nov. 15, 1991.

Rehearing Denied Nov. 27, 1991.

Petition was filed for review of final rule promulgated by Environmental Protection Agency (EPA) under Toxic Substances Control Act section prohibiting future manufacture, importation, processing, and distribution of asbestos in almost all products. The Court of Appeals, Jerry E. Smith, Circuit Judge, held that: (1) foreign entities lacked standing under Act to challenge rule; (2) EPA failed to give required notice to public, before conclusion of hearings, that it intended to use "analogous exposure" data to calculate expected benefits of product bans; and (3) EPA failed to give adequate weight to statutory language requiring it to promulgate least burdensome, reasonable regulation required to protect environment adequately.

Petition granted, regulation vacated, matter remanded.

West Headnotes

[1] Administrative Law and Procedure k669.1
15Ak669.1 Most Cited Cases
(Formerly 15Ak669)

[1] Environmental Law k678
149Ek678 Most Cited Cases
(Formerly 199k25.15(3.3) Health and Environment)

To extent that briefs of amici curiae raised new issues before Court of Appeals on challenge to Environmental Protection Agency's (EPA) promulgation of rule, Court would not consider those arguments; however, when those briefs raised variations of arguments also raised by petitioners, court would draw on those briefs if helpful in consideration of other issues properly brought before court.

[2] Administrative Law and Procedure k677
15Ak677 Most Cited Cases

[2] Environmental Law k686
149Ek686 Most Cited Cases
(Formerly 199k25.15(3.3) Health and Environment)

On challenge to Environmental Protection Agency's (EPA) promulgation of final rule prohibiting future manufacture, importation, processing, and distribution of asbestos in almost all products, Court of Appeals could consider arguments raised by amici that related to differences in fiber types, sizes, and manufacturing processes even if those differences only were raised by petitioners within context of prohibiting specific friction products, such as gasket sheets and roof coating; role of amici was intended to bridge gaps in issues initially and properly raised by parties.

[3] Environmental Law k656
149Ek656 Most Cited Cases

(Formerly 199k25.15(4.1), 199k25.15(4) Health and Environment)
Issue of whether foreign entities had standing to contest Environmental Protection Agency's (EPA) final asbestos rule was question of prudential standing, which was of less than constitutional dimensions; thus, touchstone of analysis was statutory language used by Congress in conferring standing upon general public.

[4] Administrative Law and Procedure k668
15Ak668 Most Cited Cases

[4] Environmental Law k651
149Ek651 Most Cited Cases

(Formerly 199k25.15(4.1), 199k25.15(4) Health and Environment)
Only those who come within zone of interests to be protected or regulated by Toxic Substances Control Act have prudential standing to bring challenges to regulations under Act; when party's interests are inconsistent with purposes implicit in Act, it can reasonably be assumed that Congress did not intend to permit suit. Toxic Substances Control Act, <section> 19(a), 15 U.S.C.A. <section> 2618(a).

[5] Administrative Law and Procedure k668
15Ak668 Most Cited Cases

Under "zone of interests" test, Court of Appeals liberally construes congressional acts to favor plaintiff's standing to challenge administrative actions; however, if plaintiff is not itself subject of contested regulatory action, test denies right of review when plaintiff's interests are so marginally related to or inconsistent with purposes implicit in statute that it cannot reasonably be assumed that Congress intended to permit suit.

[6] Administrative Law and Procedure k668
15Ak668 Most Cited Cases

[6] Environmental Law k656
149Ek656 Most Cited Cases

(Formerly 199k25.15(4.1), 199k25.15(4) Health and Environment)
Canadian mine workers lacked standing to contest Environmental Protection Agency's (EPA) promulgation of final rule under Toxic Substances Control Act section prohibiting future manufacture, importation, processing, and distribution of asbestos in almost all products; mine workers argued that EPA erred by not considering effects of ban on foreign countries and workers, but, while Act speaks of necessity of cleaning up national environment and protecting United States workers, it is largely silent concerning international effects of agency action. Toxic Substances Control Act, <section> 6, 15 U.S.C.A. <section> 2605.

[7] Administrative Law and Procedure k668
15Ak668 Most Cited Cases

[7] Environmental Law k656
149Ek656 Most Cited Cases

(Formerly 199k25.15(4.1), 199k25.15(4) Health and Environment)
Because Toxic Substances Control Act did not require Environmental Protection Agency (EPA) to consider foreign effects when promulgating final rule prohibiting future manufacture, importation, processing, and distribution of

asbestos in almost all products, Canadian asbestos mine operator lacked standing to challenge that rule, despite argument that its status as vendor to American vendee gave it right to contest administrative decisions that affected economic well-being of vendee; vendee was independent entity, fully capable of asserting its own rights. Toxic Substances Control Act, <section> 6, 15 U.S.C.A. <section> 2605.

[8] Statutes k219(1)

361k219(1) Most Cited Cases

Courts should give great weight to any reasonable construction of regulatory statute adopted by agency charged with enforcement of that statute; thus, only where congressional intent is pellucid is court entitled to reject reasonable administrative construction of statute.

[9] Environmental Law k420

149Ek420 Most Cited Cases

(Formerly 199k25.5(3.1), 199k25.5(3) Health and Environment)

In promulgating final rule under Toxic Substances Control Act section prohibiting future manufacture, importation, processing, and distribution of asbestos in almost all products, Environmental Protection Agency's (EPA) decision to ignore international effects of rule was rational construction of Act. Toxic Substances Control Act, <section> 6, 15 U.S.C.A. <section> 2605.

[10] Administrative Law and Procedure k398

15Ak398 Most Cited Cases

[10] Environmental Law k452

149Ek452 Most Cited Cases

(Formerly 199k25.5(9) Health and Environment)

During rule-making procedure which resulted in Environmental Protection Agency's (EPA) promulgation of final rule pertaining to asbestos, EPA was not required to cross-examine witnesses of opponents of rule.

[11] Administrative Law and Procedure k401

15Ak401 Most Cited Cases

[11] Environmental Law k454

149Ek454 Most Cited Cases

(Formerly 199k25.5(9) Health and Environment)

It was within Environmental Protection Agency's (EPA) discretion to designate hearing officer, rather than administrative law judge, to preside at hearings on rule under Toxic Substances Control Act to prohibit future manufacture, importation, processing, and distribution of asbestos in almost all products. Toxic Substances Control Act, <section> 6, 15 U.S.C.A. <section> 2605.

[12] Administrative Law and Procedure k398

15Ak398 Most Cited Cases

[12] Environmental Law k452

149Ek452 Most Cited Cases

(Formerly 199k25.5(9) Health and Environment)

During rule-making procedure which resulted in Environmental Protection Agency's (EPA) promulgation of final rule under Toxic Substances Control Act section prohibiting future manufacture, importation, processing, and distribution of asbestos in almost all products, EPA was not required to assemble panel of experts on asbestos disease risks; EPA already possessed abundance of information on subject. Toxic Substances Control Act, <section>

6, 15 U.S.C.A. <section> 2605.

[13] Administrative Law and Procedure k416.1
15Ak416.1 Most Cited Cases
(Formerly 15Ak416)

Agency's choices concerning its rule-making procedures are entitled to great deference, as agencies are best suited to determine how they should allocate their finite resources.

[14] Administrative Law and Procedure k398
15Ak398 Most Cited Cases

[14] Environmental Law k452
149Ek452 Most Cited Cases

(Formerly 199k25.5(9) Health and Environment)

In rule-making proceedings which resulted in Environmental Protection Agency's (EPA) issuance of final rule under Toxic Substances Control Act section prohibiting future manufacture, importation, processing, and distribution of asbestos in almost all products, EPA's general failure to accord interested parties adequate cross-examination of all of EPA's major witnesses, while improper, was insufficient by itself to mandate overturning rule. Toxic Substances Control Act, <section><section> 6(c)(3), 19(c)(1)(B)(ii), 15 U.S.C.A. <section><section> 2605(c)(3), 2618(c)(1)(B)(ii).

[15] Administrative Law and Procedure k394
15Ak394 Most Cited Cases

[15] Administrative Law and Procedure k817.1
15Ak817.1 Most Cited Cases
(Formerly 15Ak817)

[15] Environmental Law k453
149Ek453 Most Cited Cases

(Formerly 199k25.5(9) Health and Environment)

[15] Environmental Law k698
149Ek698 Most Cited Cases

(Formerly 199k25.15(12) Health and Environment)

Environmental Protection Agency's (EPA) failure to give notice to public, before conclusion of hearings on rule under Toxic Substances Control Act to prohibit future manufacture, importation, processing, and distribution of asbestos in almost all products, that EPA intended to use "analogous exposure" data to calculate expected benefits of product bans required vacation of rule and remand to EPA for further proceedings; analogous exposure estimates supported substantial part of rule finally promulgated by EPA. Toxic Substances Control Act, <section> 6, 15 U.S.C.A. <section> 2605.

[16] Administrative Law and Procedure k797
15Ak797 Most Cited Cases

Court of Appeals uses relatively lenient standard in judging administrative rule-making proceedings.

[17] Administrative Law and Procedure k791
15Ak791 Most Cited Cases

Substantial evidence to support final agency rule requires something less than the weight of the evidence, and possibility of drawing two inconsistent conclusions from evidence does not prevent agency's finding from being

supported by substantial evidence; this standard requires that agency's decision be based on entire record, taking into account whatever in record detracts from weight of agency's decision, and that agency's decision be what reasonable mind might accept as adequate to support its conclusion.

[18] Administrative Law and Procedure k763
15Ak763 Most Cited Cases

[18] Administrative Law and Procedure k791
15Ak791 Most Cited Cases

[18] Environmental Law k686
149Ek686 Most Cited Cases

(Formerly 199k25.15(7) Health and Environment)

Arbitrary and capricious standard found in Administrative Procedure Act and substantial evidence standard found in Toxic Substances Control Act (TSCA) are different standards, even in context of informal rule making; substantial evidence standard mandated by TSCA is generally considered to be more rigorous than arbitrary and capricious standard normally applied to informal rule making, and affords considerably more generous judicial review than arbitrary and capricious test. 5 U.S.C.A. <section> 551 et seq.; Toxic Substances Control Act, <section> 19(c) (1) (B) (i), 15 U.S.C.A. <section> 2618(c) (1) (B) (i).

[19] Administrative Law and Procedure k791
15Ak791 Most Cited Cases

[19] Environmental Law k686
149Ek686 Most Cited Cases

(Formerly 199k25.15(7) Health and Environment)

Substantial evidence standard mandated by Toxic Substances Control Act imposes considerable burden on agency and limits its discretion in arriving at factual predicate. Toxic Substances Control Act, <section> 19(c) (1) (B) (i), 15 U.S.C.A. <section> 2618(c) (1) (B) (i).

[20] Administrative Law and Procedure k791
15Ak791 Most Cited Cases

[20] Environmental Law k686
149Ek686 Most Cited Cases

(Formerly 199k25.15(7) Health and Environment)

Under substantial evidence standard of Toxic Substances Control Act, reviewing court must give careful scrutiny to agency findings and, at same time, accord appropriate deference to administrative decisions that are based on agency experience and expertise. Toxic Substances Control Act, <section> 19(c) (1) (B) (i), 15 U.S.C.A. <section> 2618(c) (1) (B) (i).

[21] Administrative Law and Procedure k791
15Ak791 Most Cited Cases

[21] Environmental Law k686
149Ek686 Most Cited Cases

(Formerly 199k25.15(7) Health and Environment)

In evaluating whether Environmental Protection Agency (EPA) has presented substantial evidence to support final rule regulating substance under Toxic Substances Control Act, court examines whether quantities of regulated chemical entering into environment are "substantial" and whether human exposure to chemical is "substantial" or "significant." Toxic Substances

Control Act, <section> 6, 15 U.S.C.A. <section> 2605.

[22] Administrative Law and Procedure k402

15Ak402 Most Cited Cases

Agency may exercise its judgment without strictly relying on quantifiable risks, costs, and benefits, but it must cogently explain why it has exercised its discretion in given manner and must offer rational connection between facts found and choice made.

[23] Administrative Law and Procedure k391

15Ak391 Most Cited Cases

All agency rules are given presumption of validity, and it is up to challenger to any rule to show that agency action is invalid.

[24] Administrative Law and Procedure k750

15Ak750 Most Cited Cases

[24] Environmental Law k464

149Ek464 Most Cited Cases

(Formerly 199k25.15(5.1) Health and Environment)

Upon judicial review, burden remains on Environmental Protection Agency (EPA) to justify that products it bans under Toxic Substances Control Act present unreasonable risk, no matter how regulated. Toxic Substances Control Act, <section> 6, 15 U.S.C.A. <section> 2605.

[25] Environmental Law k420

149Ek420 Most Cited Cases

(Formerly 199k25.5(3.1), 199k25.5(3) Health and Environment)

Environmental Protection Agency (EPA) presented insufficient evidence to justify its final rule under Toxic Substances Control Act section prohibiting future manufacture, importation, processing, and distribution of asbestos in almost all products; EPA failed to consider all necessary evidence and failed to give adequate weight to statutory language requiring it to promulgate least burdensome, reasonable regulation required to protect environment adequately. Toxic Substances Control Act, <section> 6(a), 15 U.S.C.A. <section> 2605(a).

[26] Environmental Law k420

149Ek420 Most Cited Cases

(Formerly 199k25.5(3.1), 199k25.5(3) Health and Environment)

In promulgating final rule under Toxic Substances Control Act section banning asbestos, Environmental Protection Agency (EPA) failed to show it met requirement under Act that EPA use least burdensome regulation to achieve its goals of minimum reasonable risk; EPA rejected calculating how many lives less burdensome regulation would save, and at what cost, and, when calculating benefits of its ban, explicitly refused to compare it to improved workplace in which currently available control technology was utilized. Toxic Substances Control Act, <section> 6(a), 15 U.S.C.A. <section> 2605(a).

[27] Environmental Law k420

149Ek420 Most Cited Cases

(Formerly 199k25.5(3.1), 199k25.5(3) Health and Environment)

In order to impose regulation totally banning substance under Toxic Substances Control Act, Environmental Protection Agency (EPA) must show not only that its proposed action reduces risk of product to adequate level, but also that actions Congress identified as less burdensome also would not do job. Toxic Substances Control Act, <section> 2 et seq., 15 U.S.C.A. <section> 2601 et seq.

[28] Environmental Law k420
149Ek420 Most Cited Cases

(Formerly 199k25.5(3.1), 199k25.5(3) Health and Environment)

In promulgating rule under Toxic Substances Control Act section banning asbestos, Environmental Protection Agency (EPA) properly discounted perceived nonmonetary benefits of rule in saving human lives; however, EPA's choice of 13-year period of its calculations was so short as to make unquantified period so unreasonably large that any EPA reliance upon it had to be displaced. Toxic Substances Control Act, <section> 6(a), 15 U.S.C.A. <section> 2605(a).

[29] Environmental Law k451
149Ek451 Most Cited Cases

(Formerly 199k25.5(9) Health and Environment)

Waiver provision allowing Environmental Protection Agency (EPA) to extend temporarily the planned phase-out of banned products if hoped-for substitutes fail to materialize in time may not be used by EPA to lessen its burden when justifying banning products under Toxic Substances Control Act without existing substitutes; by its own terms, exemption shifts burden onto waiver proponent to convince EPA that waiver is justified, and waiver only may be granted by EPA in very limited circumstances. Toxic Substances Control Act, <section> 6(c)(1)(C), 15 U.S.C.A. <section> 2605(c)(1)(C).

[30] Environmental Law k420
149Ek420 Most Cited Cases

(Formerly 199k25.5(3.1), 199k25.5(3) Health and Environment)

Under Toxic Substances Control Act, agency is empowered to issue safety standards which require improvements in existing technology or which require development of new technology; however, where no substitutes presently exist, agency bears heavier burden to show that product ban is justified. Toxic Substances Control Act, <section> 6(c)(1)(C), 15 U.S.C.A. <section> 2605(c)(1)(C).

[31] Environmental Law k420
149Ek420 Most Cited Cases

(Formerly 199k25.5(3.1), 199k25.5(3) Health and Environment)

Environmental Protection Agency's (EPA) ban of asbestos under Toxic Substances Control Act lacked reasonable basis required by Act, as EPA did not consider harm that could flow from increased use of products designed to substitute for asbestos, even where probable substitutes themselves were known carcinogens. Toxic Substances Control Act, <section> 6(a), 15 U.S.C.A. <section> 2605(a).

[32] Environmental Law k420
149Ek420 Most Cited Cases

(Formerly 199k25.5(3.1), 199k25.5(3) Health and Environment)

Once interested party brings forth credible evidence suggesting toxicity of probable or only alternatives to substance which Environmental Protection Agency (EPA) proposes to ban under Toxic Substances Control Act, EPA must consider comparative toxic costs of each. Toxic Substances Control Act, <section> 6(c)(1)(C), 15 U.S.C.A. <section> 2605(c)(1)(C).

[33] Environmental Law k414
149Ek414 Most Cited Cases

(Formerly 199k25.5(3.1), 199k25.5(3) Health and Environment)

Requirement that risk be "unreasonable" before Environmental Protection Agency (EPA) may engage in rule making under Toxic Substances Control Act necessarily involves balancing test like that familiar in tort law;

regulation may issue if severity of injury that may result from product, factored by likelihood of injury, offsets harm regulation itself imposes upon manufacturers and consumers. Toxic Substances Control Act, <section> 2(c), 15 U.S.C.A. <section> 2601(c).

[34] Environmental Law k420

149Ek420 Most Cited Cases

(Formerly 199k25.5(3.1), 199k25.5(3) Health and Environment)

Environmental Protection Agency (EPA) must articulate "understandable basis" to support its Toxic Substances Control Act action with respect to each substance or application of substance banned; to make finding of unreasonable risk based upon this assessment, EPA must balance probability that harm will occur from activities against effects of proposed regulatory action on availability to society of benefits of banned substance. Toxic Substances Control Act, <section><section> 6(a), 19(c)(1)(B)(i), 15 U.S.C.A. <section><section> 2605(a), 2618(c)(1)(B)(i).

[35] Environmental Law k420

149Ek420 Most Cited Cases

(Formerly 199k25.5(3.1), 199k25.5(3) Health and Environment)

Environmental Protection Agency's (EPA) final rule under Toxic Substances Control Act banning friction products such as brakes, which constituted most of proposed benefits of asbestos ban, was unreasonable due to EPA's failure to examine effect of nonasbestos brakes on automotive safety in light of credible evidence that nonasbestos brakes could increase significantly the number of highway fatalities, and due to EPA's failure to evaluate toxicity of likely brake substitutes. Toxic Substances Control Act, <section> 19(c)(1)(B)(i), 15 U.S.C.A. <section> 2618(c)(1)(B)(i).

[36] Environmental Law k420

149Ek420 Most Cited Cases

(Formerly 199k25.5(3.1), 199k25.5(3) Health and Environment)

Environmental Protection Agency (EPA) failed to present substantial evidence to support its ban of asbestos pipe under Toxic Substances Control Act; EPA refused to assess risks of substitutes to asbestos pipe, despite EPA's concession that most likely substitutes for asbestos pipe also contained known carcinogens. Toxic Substances Control Act, <section><section> 6(c)(1)(C), 19(c)(1)(B)(i), 15 U.S.C.A. <section><section> 2605(c)(1)(C), 2618(c)(1)(B)(i)

.

[37] Environmental Law k420

149Ek420 Most Cited Cases

(Formerly 199k25.5(3.1), 199k25.5(3) Health and Environment)

In those cases in which complete ban of substance under Toxic Substances Control Act would save less than one statistical life, such as those affecting asbestos paper products and certain roofing materials, Environmental Protection Agency (EPA) has particular need to examine less burdensome alternatives to complete ban. Toxic Substances Control Act, <section> 6(a), 15 U.S.C.A. <section> 2605(a).

[38] Environmental Law k420

149Ek420 Most Cited Cases

(Formerly 199k25.5(3.1), 199k25.5(3) Health and Environment)

Under Toxic Substances Control Act, Environmental Protection Agency (EPA) could properly attempt to promulgate "cleanup" ban precluding future uses of asbestos even in products not yet on market. Toxic Substances Control Act, <section><section> 5, 6, 15 U.S.C.A. <section><section> 2604, 2605.

[39] Environmental Law k420
149Ek420 Most Cited Cases

(Formerly 199k25.5(3.1), 199k25.5(3) Health and Environment)

Under sections of Toxic Substances Control Act which allow Environmental Protection Agency (EPA) to ban product "that presents or will present" significant risk, EPA had authority to ban products that once were, but no longer are, being produced in United States; this applies only to products that were not being manufactured, imported, or processed on July 12, 1989, date of rule's promulgation. Toxic Substances Control Act <section><section> 5, 6; 15 U.S.C.A. <section><section> 2604, 2605.

*1206 Wm. K. Reilly, Adm'r, E.P.A., Charles Edward Breece, Mary Elizabeth Ward, Richard Thornburgh, Atty. Gen., U.S. Dept. of Justice, Washington, D.C., for E.P.A.

Eve C. Gartner, Berle, Kass & Case, New York City, Karen Florini, Environmental Defense Fund, Washington, D.C., for Natural Resources Defense Council, Inc.

Jacqueline M. Warren, Natural Resources Defense Council, New York City, for Environmental Defense Fund.

Richard J. Fiesta, Robert J. Connerton, Connerton, Ray & Simon, Washington, D.C., for Laborers' Intern. Union of North America, AFL-CIO and Laborers' Nat. Health and Safety Fund.

Martha A. Churchill, Gen. Counsel, Chicago, Ill., for Mid-America Legal Foundation.

Donald N. Dewees, Toronto, Canada, for Federal Government of Canada.

Arthur Kahn, Schnader, Harrison, Segal & Lewis, Philadelphia, Pa., for amici-applicant The Province of Quebec, Canada.

Robert E. Holden, Mary S. Johnson, Liskow & Lewis, New Orleans, La., for Corrosion Proof Fittings, et al.

Edward W. Warren, Timothy S. Hardy, Susan M. O'Sullivan, Kathleen L. Blaner, Kirkland & Ellis, Washington, D.C., for Abestor Information Ass'n & Asbestor Cement, and the Asbestos Institute, et al.

Michael M. Levy, Levy & Smith, Washington, D.C., for United Steel Workers of America (Canada), et al.

Frederick C. Schafrick, Thomas J. Mikula, David Booth Beers, Michael S. Giannotto, Shea & Gardner, Washington, D.C., for Cassiar Min. Corp.

Duane A. Siler, Patton Boggs & Blow, Washington, D.C. for Institute of Scrap Recycling Ind., Inc.

Jeryl Dezelick, Robert E. Mann, Seyfarth, Shaw, Fairweather & Geraldson, Chicago, Ill., for Caterpillar Tractor Co.

*1207 Jane B. McAllister, Ahlers, Cooney, Dorweiler, Des Moines, Iowa, for Grinnell College.

Donald Elisburg, Brian M. Hechinger, OHF, Edward J. Gorman, III, Orrin

Baird, Washington, D.C., for Occ. Health Found. United Broth. of Carp. & Joinders and Service Employees Intern. Union.

On Petition for Review of a Rule of the Environmental Protection Agency.

Before BROWN, SMITH, and WIENER, Circuit Judges.

JERRY E. SMITH, Circuit Judge:

The Environmental Protection Agency (EPA) issued a final rule under section 6 of the Toxic Substances Control Act (TSCA) to prohibit the future manufacture, importation, processing, and distribution of asbestos in almost all products. Petitioners claim that the EPA's rulemaking procedure was flawed and that the rule was not promulgated on the basis of substantial evidence. Certain petitioners and amici curiae contend that the EPA rule is invalid because it conflicts with international trade agreements and may have adverse economic effects on Canada and other foreign countries. Because the EPA failed to muster substantial evidence to support its rule, we remand this matter to the EPA for further consideration in light of this opinion.

I.

Facts and Procedural History.

Asbestos is a naturally occurring fibrous material that resists fire and most solvents. Its major uses include heat-resistant insulators, cements, building materials, fireproof gloves and clothing, and motor vehicle brake linings. Asbestos is a toxic material, and occupational exposure to asbestos dust can result in mesothelioma, asbestosis, and lung cancer.

The EPA began these proceedings in 1979, when it issued an Advanced Notice of Proposed Rulemaking announcing its intent to explore the use of TSCA "to reduce the risk to human health posed by exposure to asbestos." See 54 Fed.Reg. 29,460 (1989). While these proceedings were pending, other agencies continued their regulation of asbestos uses, in particular the Occupational Safety and Health Administration (OSHA), which in 1983 and 1984 involved itself with lowering standards for workplace asbestos exposure. [FN1]

FN1. OSHA began to regulate asbestos in the workplace in 1971. At that time, the permissible exposure limit was 12 fibers per cubic centimeter (f/cc), which OSHA lowered several times until today it stands at 0.2 f/cc. OSHA currently is considering lowering the limit to 0.1 f/cc, following a challenge to the regulation in *Building & Constr. Trades Dep't v. Brock*, 838 F.2d 1258, 1267-69 (D.C.Cir.1988). The Mine Safety and Health Administration (MSHA) since 1976 has limited mine worker asbestos exposure to 2 f/cc. See 30 C.F.R. <section> 71.702 (1990). The Consumer Product Safety Commission (CPSC) has banned consumer patching compounds containing respirable asbestos, see 16 C.F.R. <section><section> 1304-05 (1990), and also requires labeling for other products containing respirable asbestos. Similarly, the Food and Drug Administration has banned general-use garments containing asbestos unless used for protection against fire. See 16 C.F.R. <section> 1500.17 (1990).

An EPA-appointed panel reviewed over one hundred studies of asbestos and conducted several public meetings. Based upon its studies and the public comments, the EPA concluded that asbestos is a potential carcinogen at all levels of exposure, regardless of the type of asbestos or the size of the fiber. The EPA concluded in 1986 that exposure to asbestos "poses an

unreasonable risk to human health" and thus proposed at least four regulatory options for prohibiting or restricting the use of asbestos, including a mixed ban and phase-out of asbestos over ten years; a two-stage ban of asbestos, depending upon product usage; a three-stage ban on all asbestos products leading to a total ban in ten years; and labeling of all products containing asbestos. Id. at 29,460-61.

Over the next two years, the EPA updated its data, received further comments, and allowed cross-examination on the updated documents. In 1989, the EPA issued a final rule prohibiting the manufacture, importation,*1208 processing, and distribution in commerce of most asbestos-containing products. Finding that asbestos constituted an unreasonable risk to health and the environment, the EPA promulgated a staged ban of most commercial uses of asbestos. The EPA estimates that this rule will save either 202 or 148 lives, depending upon whether the benefits are discounted, at a cost of approximately \$450-800 million, depending upon the price of substitutes. Id. at 29,468.

The rule is to take effect in three stages, depending upon the EPA's assessment of how toxic each substance is and how soon adequate substitutes will be available. [FN2] The rule allows affected persons one more year at each stage to sell existing stocks of prohibited products. The rule also imposes labeling requirements on stage 2 or stage 3 products and allows for exemptions from the rule in certain cases.

FN2. The main products covered by each ban stage are as follows:
(1) Stage 1: August 27, 1990: ban on asbestos-containing floor materials, clothing, roofing felt, corrugated and flat sheet materials, pipeline wrap, and new asbestos uses; (2) Stage 2: August 25, 1993: ban on asbestos-containing "friction products" and certain automotive products or uses;
(3) Stage 3: August 26, 1996: ban on other asbestos-containing automotive products or uses, asbestos-containing building materials including non-roof and roof coatings, and asbestos cement shingles.
See 54 Fed.Reg. at 29,461-62.

Section 19(a) of TSCA, 15 U.S.C. <section> 2618(a), grants interested parties the right to appeal a final rule promulgated under section 6(a) directly to this or any other regional circuit court of appeals. Pursuant to this section, petitioners challenge the EPA's final rule, claiming that the EPA's rulemaking procedure was flawed and that the rule was not promulgated based upon substantial evidence. Some amici curiae also contend that the rule is invalid because it conflicts with international trade agreements and may have adverse economic effects on Canada and other foreign countries. We deal with each of these contentions seriatim.

II.

Standing.

A.

Issues Raised Solely by Amici Curiae.

[1] The EPA argues that the briefs of two of the amici curiae, Quebec and Canada, should be stricken because they improperly raise arguments not mentioned by any petitioner. To the extent that these briefs raise new issues, such as the EPA's decision not to consider the adverse impacts of the asbestos ban on the development of the economies of third-world countries, we disregard these arguments. [FN3] At times, however, the briefs raise variations of arguments also raised by petitioners. We thus draw on these briefs where helpful in our consideration of other issues properly brought

before this court by the parties.

FN3. See *Bell v. Wolfish*, 441 U.S. 520, 531 n. 13, 99 S.Ct. 1861, 1870 n. 13, 60 L.Ed.2d 447 (1979). While it is true that the joint brief of petitioners Centrale des Syndicats Democratiques, Confederation des Syndicats Nationaux, and United Steel Workers of America (Canada) (collectively along with petitioner Cassiar Mining Corp. (Cassiar), the "Canadian petitioners") also deal with some of the same issues raised by amici, we hold in part II.B, *infra*, that these petitioners lack standing. The arguments of amici cannot be bootstrapped into this case based upon the arguments of petitioners who themselves lack standing.

[2] The EPA also asserts that we cannot consider arguments raised by the two amici that relate to the differences in fiber types, sizes, and manufacturing processes because these differences only are raised by the petitioners within the context of prohibiting specific friction products, such as sheet gaskets and roof coating. This is, however, a role that amici are intended to fill: to bridge gaps in issues initially and properly raised by parties. Because various petitioners urge arguments similar to these, we properly can consider these specific issues articulated in the amici briefs. [FN4]

FN4. The EPA also seeks to bar the brief of Grinnell College. That brief, however, presents arguments directly related to the arguments raised by the parties seeking to prevent the ban of asbestos shingles.

*1209 B.

Standing of Foreign Entities Under TSCA.

The EPA also contends that certain foreign petitioners and amici do not have standing to contest the EPA's final rule. In its final rulemaking, the EPA decided to exclude foreign effects from its analysis. Cassiar Mining Corporation, a Canadian mining company that operates an asbestos mine, and the other Canadian petitioners believe that the EPA erred by not considering the effects of the ban on foreign countries and workers.

[3] At issue in this case is a question of prudential standing, which is of less than constitutional dimensions. The touchstone of the analysis, therefore, is the statutory language used by Congress in conferring standing upon the general public. *Warth v. Seldin*, 422 U.S. 490, 501, 95 S.Ct. 2197, 2206, 45 L.Ed.2d 343 (1975).

[4] Only those who come within the "zone of interests to be protected or regulated by the statute" have prudential standing to bring challenges to regulations under the statute at issue. [FN5] Indeed, when a party's interests are "inconsistent with the purposes implicit in the statute," it can "reasonably be assumed that Congress [did not] intend[] to permit the suit." *Clarke*, 479 U.S. at 399, 107 S.Ct. at 757.

FN5. *Association of Data Processing Serv. Orgs. v. Camp*, 397 U.S. 150, 153, 90 S.Ct. 827, 829, 25 L.Ed.2d 184 (1970); accord *Panhandle Producers & Royalty Owners Ass'n v. Economic Regulatory Admin.*, 847 F.2d 1168, 1173-74 (5th Cir.1988); *Hazardous Waste Treatment Council v. EPA*, 861 F.2d 277, 282 (D.C.Cir.1988) (per curiam), cert. denied, 490 U.S. 1106, 109 S.Ct. 3157, 104 L.Ed.2d 1020 (1989). We note that the zone of interest test is not one universally applied outside the context of the Administrative Procedure Act (APA), see *Clarke v. Securities Indus. Ass'n*, 479 U.S. 388, 400 n. 16, 107 S.Ct. 750, 757 n. 16, 93 L.Ed.2d 757 (1987), but because it is the most useful factor in considering

Congressional intent on the question of standing, we invoke it as an aid to our decisionmaking today, as we sometimes have in the past. Cf. *Moses v. Banco Mortgage Co.*, 778 F.2d 267, 271 (5th Cir.1985).

The Canadian petitioners believe that Congress, by granting the right of judicial review to "any person," 15 U.S.C.A. <section> 2618(a)(1)(A) (West Supp.1991), meant to confer standing on anyone who could arrange transportation to the courthouse door. The actual language of TSCA, however, belies the broad meaning the petitioners attempt to impart to the act, for the EPA was not required to consider the effects on people or entities outside the United States. TSCA provides a laundry list of factors to consider when promulgating a rule under section 6, including "the effect [of the rule] on the national economy." *Id.* <section> 2605(c)(1)(D) (emphasis added). International concerns are conspicuously absent from the statute.

[5] Under the "zone of interests" test, we liberally construe Congressional acts to favor a plaintiff's standing to challenge administrative actions. *Warth*, 422 U.S. at 501, 95 S.Ct. at 2206. This is not to say, however, that all plaintiffs affected by a regulation or order have standing to sue; "[i]n cases where the plaintiff is not itself the subject of the contested regulatory action, the test denies a right of review if the plaintiff's interests are so marginally related to or inconsistent with the purposes implicit in the statute that it cannot reasonably be assumed that Congress intended to permit the suit." *Clarke*, 479 U.S. at 399, 107 S.Ct. at 757.

[6] The Canadian petitioners do not have standing to contest the EPA's actions. Nothing in the statute requires the EPA to consider the effects of its actions in areas outside the scope of section 6. TSCA speaks of the necessity of cleaning up the national environment and protecting United States workers but largely is silent concerning the international effects of agency action. Because of this national emphasis, we are reluctant to ascribe international standing rights to foreign workers affected by the loss of economic sales within this country. We note that the Supreme Court, using similar analysis, recently denied standing rights to workers only incidentally affected by a postal regulation. *Air Courier Conference of Am. v. American Postal Workers Union*, 498 U.S. 517, 111 S.Ct. 913, 112 L.Ed.2d 1125 (1991). Indeed, to "proceed[] at the behest of interests that *1210 coincide only accidentally with [the statutory] goals" of TSCA actually may work to defeat those goals. *Hazardous Waste Treatment Council*, 861 F.2d at 283. We therefore do not consider the arguments raised by the Canadian petitioners.

[7] Cassiar separately asserts even closer contacts with the United States and believes that its status as a vendor to an American vendee gives it the right to contest administrative decisions that affect the economic well-being of the vendee. Some courts recognize that vendors can stand as third parties in the shoes of their vendees in order to contest administrative decisions.

[FN6]

FN6. See, e.g., *Carey v. Population Serv. Int'l*, 431 U.S. 678, 683-84 & n. 4, 97 S.Ct. 2010, 2015 & n. 4, 52 L.Ed.2d 675 (1977); *National Cottonseed Prods. Ass'n v. Brock*, 825 F.2d 482, 489-92 (D.C.Cir.1987), cert. denied, 485 U.S. 1020, 108 S.Ct. 1573, 99 L.Ed.2d 889 (1988); *FAIC Sec. v. United States*, 768 F.2d 352, 357-61 (D.C.Cir.1985). *Carey*, however, gives *jus tertii* standing to a party only if the party directly affected is incapable of asserting its own interests, which is not true in the instant case. See *Carey*, 431 U.S. at 683-84, 97 S.Ct. at 2015; accord *Craig v. Boren*, 429 U.S. 190, 195- 96, 97 S.Ct. 451, 456, 50

L.Ed.2d 397 (1976). The cases from the District of Columbia Circuit, represented by National Cottonseed and FAIC Securities, appear to go too far in expanding the exception in the vendor-vendee relationship, at least when evaluating a statute so purely national in scope.

Even if we were to accept this line of reasoning, however, the result would be unavailing. Cassiar's vendee is an independent entity, fully capable of asserting its own rights. Given the purely national scope of TSCA, Cassiar cannot bootstrap from its vendee simply because it sells asbestos to an American company. Merely inserting a product into the stream of commerce is not sufficient to confer standing under TSCA. If the rule were otherwise, the concept of standing would lose all meaning, for the only parties who would not have standing would be those who sell nothing in the United States and thus are indifferent to federal government actions. There is no indication that Congress intended to enact so loose a concept of standing, and we do not import that intent into the act today. [FN7]

FN7. See Warth, 422 U.S. at 501, 95 S.Ct. at 2206 (noting that courts generally are reluctant "to extend judicial power when the plaintiff's claim to relief rests on the legal rights of third parties"). Cassiar mentions only one case, *Constructores Civiles de Centroamerica, S.A. v. Hannah*, 459 F.2d 1183, 1190-91 (D.C.Cir.1972), in which a foreign vendor was able to borrow its domestic vendee's standing rights to pursue its own claim. That case, however, involved the APA, which, unlike TSCA, does not confine itself to matters concerning national economic interests.

Hence, Cassiar does not have prudential standing to bring this claim, because TSCA expressly concerns itself with national economic concerns. Cassiar brings forth no evidence that it actually controls, and does not just deal with, the American vendee. We thus conclude, along the lines of *Moses*, 778 F.2d at 271-72, that parties that Congress specifically did not intend to participate in, or benefit from, an administrative decision have no right to challenge the legitimacy of that decision.

[8] We draw support for our holding from the decision of the EPA to give a similar construction to TSCA. "It is settled that courts should give great weight to any reasonable construction of a regulatory statute adopted by the agency charged with the enforcement of that statute." *Investment Co. Inst. v. Camp*, 401 U.S. 617, 626-27, 91 S.Ct. 1091, 1097, 28 L.Ed.2d 367 (1971). "Thus, only where congressional intent is pellucid are we entitled to reject reasonable administrative construction of a statute." *National Grain & Feed Ass'n v. OSHA*, 866 F.2d 717, 733 (5th Cir.1989).

[9] We find the EPA's decision to ignore the international effects of its decision to be a rational construction of the statute. *Chemical Mfrs. Ass'n v. Natural Resources Defense Council*, 470 U.S. 116, 125, 134, 105 S.Ct. 1102, 1107, 1112, 84 L.Ed.2d 90 (1985). Because it is unlikely that these foreign entities were "intended [by Congress] to be relied upon to challenge agency disregard of the law," *Clarke*, 479 U.S. at 399, 107 S.Ct. at 757 (citations omitted), we hold that they are *1211 outside the zone of interests encompassed by TSCA and thus lack standing to protest the EPA's rulemaking. [FN8]

FN8. The Canadian petitioners also allege that United States treaty obligations, such as the provisions of the General Agreement on Tariffs and Trade (GATT), award them the right to protest the EPA's actions.

GATT requires nations to indicate that their environmental decisions meet international standards, thus preventing countries from using arbitrary environmental rulings as de facto trade barriers. GATT, however, establishes trade dispute procedures of its own. These Canadian parties therefore have no standing here to challenge the EPA's decision.

III.

Rulemaking Defects.

[10][11][12] The petitioners allege that the EPA's rulemaking procedure was flawed. Specifically, the petitioners contend that the EPA erred by not cross-examining petitioner's witnesses, by not assembling a panel of experts on asbestos disease risks, by designating a hearing officer, rather than an administrative law judge (ALJ), to preside at the hearings on the rule, and by not swearing in witnesses who testified. Petitioners also complain that the EPA did not allow cross-examination of some of its witnesses and did not notify anyone until after the hearings were over that it intended to use "analogous exposure" estimates and a substitute pricing assumption to support its rule. Most of these contentions lack merit and are part of the petitioners' "protest everything" approach, [FN9] but we address specifically the two EPA actions of most concern to us, the failure of the EPA to afford cross-examination of its own witnesses and its failure to provide notice of the analogous exposure estimates.

FN9. These complaints include the failure of the EPA to cross-examine petitioners' witnesses, which it was not required to do, and the EPA's decision not to designate an ALJ, which also was within its discretion under 40 C.F.R. <section><section> 750.7 and 750.8 (1990). Similarly, the EPA's failure to issue subpoenas was of little moment, as the petitioners in fact suffered no injury from the lack of subpoenas. See id. <section> 750.5.

We also note that while an independent panel of experts often might be needed, in this case the EPA was not required to assemble such a panel on asbestos disease risks, as it already possessed an abundance of information on the subject, including a report by the members of the Ontario Royal Commission, a study often cited by the petitioners themselves. Considering the number of studies available, the EPA was not required to assemble its own panel to duplicate them, except to fill in any gaps.

[13] Administrative agencies acting under TSCA are not required to adhere to all of the procedural requirements we might require of an adjudicative body. See 15 U.S.C. <section> 2605(c)(3). In evaluating petitioners' claims, we are guided by our long-held view that an agency's choices concerning its rulemaking procedures are entitled to great deference, as the agencies are "best situated to determine how they should allocate their finite resources." Superior Oil Co. v. FERC, 563 F.2d 191, 201 (5th Cir.1977).

[14] Section 19(c)(1)(B)(ii) of TSCA requires that we hold unlawful any rule promulgated where EPA restrictions on cross-examination "precluded disclosure of disputed material facts which [were] necessary to a fair determination by the Administrator." 15 U.S.C. <section> 2618(c)(1)(B)(ii). In promulgating this rule, the EPA allowed substantial cross-examination of most, but not all, of its witnesses. Considering the importance TSCA accords to cross-examination, the EPA should have afforded interested parties full cross-examination on all of its major witnesses. We are mindful of the length of the asbestos regulatory process in this case, but Congress, in

enacting the rules governing the informal hearing process under TSCA, specifically reserved a place for proper cross-examination on issues of disputed material fact. See *id.* 2605(c)(3), 2618(c)(1)(B)(iii). Precluding cross-examination of EPA witnesses--even a minority of them--is not the proper way to expedite the finish of a lengthy rulemaking procedure.

The EPA's general failure to accord the petitioners adequate cross-examination, however, is not sufficient by itself to mandate overturning the rule. The "foundational question is whether any procedural flaw so subverts the process of judicial review that invalidation of the regulation is warranted." *1212 *Superior Oil Co.*, 563 F.2d at 201 (quoting *Alabama Ass'n of Ins. Agents v. Board of Governors of the Fed. Reserve Sys.*, 533 F.2d 224, 236-37 (5th Cir.1976)). Under this standard, the EPA's denial of cross-examination, by itself, is insufficient to force us to overturn the EPA's asbestos regulation.

[15] We cannot reach the same conclusion in another area, however. The EPA failed to give notice to the public, before the conclusion of the hearings, that it intended to use "analogous exposure" data to calculate the expected benefits of certain product bans. In general, the EPA should give notice as to its intended methodology while the public still has an opportunity to analyze, comment, and influence the proceedings. The EPA's use of the analogous exposure estimates, apart from their merits, thus should have been subjected to public scrutiny before the record was closed. While it is true that "[t]he public need not have an opportunity to comment on every bit of information influencing an agency's decision," *Texas v. Lyng*, 868 F.2d 795, 799 (5th Cir.1989), this cannot be used as a defense to the late adoption of the analogous exposure estimates, as they are used to support a substantial part of the regulation finally promulgated by the EPA. [FN10]

FN10. According to the EPA, if the analogous exposure estimates were not included, the benefits of the rule would decrease from 168 to 120 deaths avoided, discounted at 3%. 54 Fed.Reg. at 29,469, 29,485. The analogous exposure estimates, adopted after hearings were concluded, thus increase the purported benefits of the rule by more than one-third.

We draw support for this conclusion from *Aqua Slide 'N' Dive v. CPSC*, 569 F.2d 831 (5th Cir.1978), in which the CPSC decided, without granting interested parties the opportunity to comment, that its proposed regulation merely would slow the industry's rate of growth rather than actually cut sales. We rejected the CPSC's rule, and our reasons there are similar to those that require us to reject the EPA's reliance upon the analogous exposure data today:

[T]he evidence on which the Commission relies was only made public after the period for public comment on the standard had closed. Consequently, critics had no realistic chance to rebut it.... It matters not that the late submission probably did not violate the notice requirement of 5 U.S.C.A. 553.... The statute requires that the Commission's findings be supported by substantial evidence, and that requirement is not met when the only evidence on a crucial finding is alleged to be unreliable and the Commission has not exposed it to the full public scrutiny which would encourage confidence in its accuracy.

Id. at 842-43 (citations omitted) (emphasis added).

In short, the EPA should not hold critical analysis in reserve and then use it to justify its regulation despite the lack of public comment on the

validity of its basis. Failure to seek public comment on such an important part of the EPA's analysis deprived its rule of the substantial evidence required to survive judicial scrutiny, as in Aqua Slide.

[16] We reach this conclusion despite the relatively lenient standard by which we judge administrative rulemaking proceedings. E.g., *Superior Oil Co.*, 563 F.2d at 201. The EPA seeks to avert this result by contending that the petitioners had constructive notice that the EPA might adopt the analogous exposure theory because it included, among its published data, certain information that might be manipulated to support such an analysis. We hold, however, that considering that for some products the analogous exposure estimates constituted the bulk of the EPA's analysis, constructive notice was insufficient notice. [FN11] In summary, on an issue of this import, the EPA should have announced *1213 during the years in which the hearings were ongoing, rather than in the subsequent weeks after which they were closed, that it intended to use the analogous exposure estimates. On reconsideration, the EPA should open to public comment the validity of its analogous exposure estimates and methodology.

FN11. For some of the products, such as the beater-add and sheet gaskets, the analogous exposure analysis completely altered the EPA's calculus and multiplied four- or five-fold the anticipated benefits of the proposed regulation. This was a change sufficient to make the proceedings unfair to the petitioners and was of sufficient importance that the EPA's failure to afford any cross-examination on this issue was an abuse of discretion.

IV.

The Language of TSCA.

A.

Standard of Review.

Our inquiry into the legitimacy of the EPA rulemaking begins with a discussion of the standard of review governing this case. EPA's phase-out ban of most commercial uses of asbestos is a TSCA <section> 6(a) rulemaking. TSCA provides that a reviewing court "shall hold unlawful and set aside" a final rule promulgated under <section> 6(a) "if the court finds that the rule is not supported by substantial evidence in the rulemaking record ... taken as a whole." 15 U.S.C. <section> 2618(c) (1) (B) (i).

[17] Substantial evidence requires "something less than the weight of the evidence, and the possibility of drawing two inconsistent conclusions from the evidence does not prevent an administrative agency's finding from being supported by substantial evidence." *Consolo v. Federal Maritime Comm'n*, 383 U.S. 607, 620, 86 S.Ct. 1018, 1026, 16 L.Ed.2d 131 (1966). This standard requires (1) that the agency's decision be based upon the entire record, [FN12] taking into account whatever in the record detracts from the weight of the agency's decision; and (2) that the agency's decision be what " 'a reasonable mind might accept as adequate to support [its] conclusion.' " *American Textile Mfrs. Inst. v. Donovan*, 452 U.S. 490, 522, 101 S.Ct. 2478, 2497, 69 L.Ed.2d 185 (1981) (quoting *Universal Camera Corp. v. NLRB*, 340 U.S. 474, 477, 71 S.Ct. 456, 459, 95 L.Ed. 456 (1951)). Thus, even if there is enough evidence in the record to support the petitioners' assertions, we will not reverse if there is substantial evidence to support the agency's decision.

See, e.g., *Villa v. Sullivan*, 895 F.2d 1019, 1021-22 (5th Cir.1990); *Singletary v. Bowen*, 798 F.2d 818, 822-23 (5th Cir.1986); accord *Fort Valley State College v. Bennett*, 853 F.2d 862, 864 (11th Cir.1988) (reviewing court examines the entire record but defers to the agency's choice between two

conflicting views).

FN12. The term "rulemaking record" means (A) the rule being reviewed; (B) all commentary received in response to the (EPA) Administrator's notice of proposed rulemaking, and the Administrator's own published statement of the effects of exposure of the substance on health and the environment, the benefits of the substance for various uses and the availability of substitutes for such uses, and "the reasonably ascertainable economic consequences of the rule" on the national economy, small business, technological innovation, the environment, and public health; (C) transcripts of hearings on promulgation of the rule; (D) written submissions of interested parties; and (E) any other information the Administrator deems relevant. See 15 U.S.C. <section> 2618(a)(3) (referring to <section><section> 2604(f) and 2605(c)(1) in regard to component (B) above).

[18][19] Contrary to the EPA's assertions, the arbitrary and capricious standard found in the APA and the substantial evidence standard found in TSCA are different standards, even in the context of an informal rulemaking.

[FN13] Congress specifically went out of its way to provide that "the standard of review prescribed by paragraph (2)(E) of section 706 [of the APA] shall not apply and the court shall hold unlawful and set aside such rule if the court finds that the rule is not supported by substantial evidence in the rulemaking *1214 record ... taken as a whole." 15 U.S.C. <section> 2618(c)(1)(B)(i). "The substantial evidence standard mandated by [TSCA] is generally considered to be more rigorous than the arbitrary and capricious standard normally applied to informal rulemaking," *Environmental Defense Fund v. EPA*, 636 F.2d 1267, 1277 (D.C.Cir.1980), and "afford[s] a considerably more generous judicial review" than the arbitrary and capricious test. *Abbott Laboratories v. Gardner*, 387 U.S. 136, 143, 87 S.Ct. 1507, 1512, 18 L.Ed.2d 681 (1967), overruled on other grounds, *Califano v. Sanders*, 430 U.S. 99, 97 S.Ct. 980, 51 L.Ed.2d 192 (1977). The test "imposes a considerable burden on the agency and limits its discretion in arriving at a factual predicate." *Mobil Oil Corp. v. FPC*, 483 F.2d 1238, 1258 (D.C.Cir.1973).

FN13. The EPA cites *Superior Oil Co.*, 563 F.2d at 199, an APA case, for the proposition that in informal rulemaking, the arbitrary and capricious standard and the substantial evidence standard "tend to converge." While it certainly is true that the requirement of substantial evidence within formal rulemaking is more strenuous, we acknowledged in *Superior Oil* that when comparing arbitrary and capricious to substantial evidence, "[i]t is generally accepted that the latter standard allows for 'a considerably more generous judicial review' than does the former." *Id.* (quoting *Abbott Laboratories*, 387 U.S. at 143, 87 S.Ct. at 1512). Considering that Congress specifically rejected the arbitrary and capricious standard in the TSCA context, we will not act now to read that same standard back in by holding that the two standards are in fact one and the same.

[20] "Under the substantial evidence standard, a reviewing court must give careful scrutiny to agency findings and, at the same time, accord appropriate deference to administrative decisions that are based on agency experience and expertise." *Environmental Defense Fund*, 636 F.2d at 1277. As with consumer product legislation, "Congress put the substantial evidence test in the statute because it wanted the courts to scrutinize the Commission's actions more closely than an 'arbitrary and capricious' standard would allow." *Aqua Slide*, 569 F.2d at 837.

[21][22] The recent case of *Chemical Mfrs. Ass'n v. EPA*, 899 F.2d 344 (5th Cir.1990), provides our basic framework for reviewing the EPA's actions. In evaluating whether the EPA has presented substantial evidence, we examine (1) whether the quantities of the regulated chemical entering into the environment are "substantial" and (2) whether human exposure to the chemical is "substantial" or "significant." *Id.* at 359. An agency may exercise its judgment without strictly relying upon quantifiable risks, costs, and benefits, but it must "cogently explain why it has exercised its discretion in a given manner" and "must offer a 'rational connection between the facts found and the choice made.'" *Id.* (quoting *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins.*, 463 U.S. 29, 103 S.Ct. 2856, 77 L.Ed.2d 443 (1983)).

[23][24] We note that in undertaking our review, we give all agency rules a presumption of validity, and it is up to the challenger to any rule to show that the agency action is invalid. *Alabama Nursing Home Ass'n v. Harris*, 617 F.2d 388, 393-94 (5th Cir.1980). The burden remains on the EPA, however, to justify that the products it bans present an unreasonable risk, no matter how regulated. See *Industrial Union Dep't v. American Petroleum Inst.*, 448 U.S. 607, 662, 100 S.Ct. 2844, 2874, 65 L.Ed.2d 1010 (1980); cf. *National Lime Ass'n v. EPA*, 627 F.2d 416, 433 (D.C.Cir.1980) ("an initial burden of promulgating and explaining a non-arbitrary, non-capricious rule rests with the Agency"). Finally, as we discuss in detail *infra*, because TSCA instructs the EPA to undertake the least burdensome regulation sufficient to regulate the substance at issue, the agency bears a heavier burden when it seeks a partial or total ban of a substance than when it merely seeks to regulate that product. See 15 U.S.C. <section> 2605(a).

B.

The EPA's Burden Under TSCA.

TSCA provides, in pertinent part, as follows:

(a) Scope of regulation.--If the Administrator finds that there is a reasonable basis to conclude that the manufacture, processing, distribution in commerce, use, or disposal of a chemical substance or mixture, or that any combination of such activities, presents or will present an unreasonable risk of injury to health or the environment, the Administrator shall by rule apply one or more of the following requirements to such substance or mixture to the extent necessary to protect adequately against such risk *1215 using the least burdensome requirements.

Id. (emphasis added). As the highlighted language shows, Congress did not enact TSCA as a zero-risk statute. [FN14] The EPA, rather, was required to consider both alternatives to a ban and the costs of any proposed actions and to "carry out this chapter in a reasonable and prudent manner [after considering] the environmental, economic, and social impact of any action." 15 U.S.C. <section> 2601(c).

FN14. Cf. *Southland Mower Co. v. CPSC*, 619 F.2d 499, 510 (5th Cir.1980) ("It must be remembered that '[t]he statutory term "unreasonable risk" presupposes that a real, and not a speculative, risk be found to exist and that the Commission bear the burden of demonstrating the existence of such a risk before proceeding to regulate.'" (Citation omitted)).

[25] We conclude that the EPA has presented insufficient evidence to justify its asbestos ban. We base this conclusion upon two grounds: the failure of the EPA to consider all necessary evidence and its failure to give adequate weight to statutory language requiring it to promulgate the least burdensome, reasonable regulation required to protect the environment adequately.

Because the EPA failed to address these concerns, and because the EPA is required to articulate a "reasoned basis" for its rules, we are compelled to return the regulation to the agency for reconsideration.

1.

Least Burdensome and Reasonable.

[26] TSCA requires that the EPA use the least burdensome regulation to achieve its goal of minimum reasonable risk. This statutory requirement can create problems in evaluating just what is a "reasonable risk." Congress's rejection of a no-risk policy, however, also means that in certain cases, the least burdensome yet still adequate solution may entail somewhat more risk than would other, known regulations that are far more burdensome on the industry and the economy. The very language of TSCA requires that the EPA, once it has determined what an acceptable level of non-zero risk is, choose the least burdensome method of reaching that level.

In this case, the EPA banned, for all practical purposes, all present and future uses of asbestos--a position the petitioners characterize as the "death penalty alternative," as this is the most burdensome of all possible alternatives listed as open to the EPA under TSCA. TSCA not only provides the EPA with a list of alternative actions, but also provides those alternatives in order of how burdensome they are. [FN15] The *1216 regulations thus provide for EPA regulation ranging from labeling the least toxic chemicals to limiting the total amount of chemicals an industry may use.

Total bans head the list as the most burdensome regulatory option.

FN15. The statute provides, in order, the possible regulatory schemes as follows:

(1) A requirement (A) prohibiting the manufacturing, processing, or distribution in commerce of such substance or mixture, or (B) limiting the amount of such substance or mixture which may be manufactured, processed, or distributed in commerce.

(2) A requirement--

(A) prohibiting the manufacture, processing, or distribution in commerce of such substance or mixture for (i) a particular use or (ii) a particular use in a concentration in excess of a level specified by the Administrator in the rule imposing the requirement, or (B) limiting the amount of such substance or mixture which may be manufactured, processed, or distributed in commerce for (i) a particular use or (ii) a particular use in a concentration in excess of a level specified by the Administrator in the rule imposing the requirement.

(3) A requirement that such substance or mixture or any article containing such substance or mixture be marked with or accompanied by clear and adequate warnings and instructions with respect to its use, distribution in commerce, or disposal or with respect to any combination of such activities. The form and content of such warnings and instructions shall be prescribed by the Administrator.

(4) A requirement that manufacturers and processors of such substance or mixture make and retain records of the processes used to manufacture or process such substance or mixture and monitor or conduct tests which are reasonable and necessary to assure compliance with the requirements of any rule applicable under this subsection.

(5) A requirement prohibiting or otherwise regulating any manner or method of commercial use of such substance or mixture.

(6) (A) A requirement prohibiting or otherwise regulating any manner or method of disposal of such substance or mixture, or of any article containing such substance or mixture, by its manufacturer or processor

or by any other person who uses, or disposes of, it for commercial purposes. (B) A requirement under subparagraph (A) may not require any person to take any action which would be in violation of any law or requirement of, or in effect for, a State or political subdivision, and shall require each person subject to it to notify each State and political subdivision in which a required disposal may occur of such disposal.

(7) A requirement directing manufacturers or processors of such substance or mixture (A) to give notice of such unreasonable risk of injury to distributors in commerce of such substance or mixture and, to the extent reasonably ascertainable, to other persons in possession of such substance or mixture or exposed to such substance or mixture, (B) to give public notice of such risk of injury, and (C) to replace or repurchase such substance or mixture as elected by the person to which the requirement is directed.

15 U.S.C. <section> 2605(a). As is plain from the order in which they are listed, options at the top of the list are the most burdensome regulatory options, progressively declining to the least burdensome option.

By choosing the harshest remedy given to it under TSCA, the EPA assigned to itself the toughest burden in satisfying TSCA's requirement that its alternative be the least burdensome of all those offered to it. Since, both by definition and by the terms of TSCA, the complete ban of manufacturing is the most burdensome alternative--for even stringent regulation at least allows a manufacturer the chance to invest and meet the new, higher standard--the EPA's regulation cannot stand if there is any other regulation that would achieve an acceptable level of risk as mandated by TSCA.

We reserve until a later part of the opinion a product-by-product review of the regulation. Before reaching this analysis, however, we lay down the inquiry that the EPA should undertake whenever it seeks total ban of a product.

The EPA considered, and rejected, such options as labeling asbestos products, thereby warning users and workers involved in the manufacture of asbestos-containing products of the chemical's dangers, and stricter workplace rules. EPA also rejected controlled use of asbestos in the workplace and deferral to other government agencies charged with worker and consumer exposure to industrial and product hazards, such as OSHA, the CPSC, and the MSHA. The EPA determined that deferral to these other agencies was inappropriate because no one other authority could address all the risks posed "throughout the life cycle" by asbestos, and any action by one or more of the other agencies still would leave an unacceptable residual risk. [FN16]

FN16. EPA argues that OSHA can only deal with workplace exposures to asbestos and that the CPSC and MSHA cannot take up the slack, as the CPSC can impose safety standards for asbestos products based only upon the risk to consumers, and MSHA can protect against exposure only in the mining and milling process. These agencies leave unaddressed dangers posed by asbestos exposure through product repair, installation, wear and tear, and the like.

Much of the EPA's analysis is correct, and the EPA's basic decision to use TSCA as a comprehensive statute designed to fight a multi-industry problem was a proper one that we uphold today on review. What concerns us, however, is the manner in which the EPA conducted some of its analysis. TSCA requires

the EPA to consider, along with the effects of toxic substances on human health and the environment, "the benefits of such substance[s] or mixture[s] for various uses and the availability of substitutes for such uses," as well as "the reasonably ascertainable economic consequences of the rule, after consideration for the effect on the national economy, small business, technological innovation, the environment, and public health." Id. <section> 2605(c)(1)(C-D).

The EPA presented two comparisons in the record: a world with no further regulation under TSCA, and a world in which no manufacture of asbestos takes place. The EPA rejected calculating how many lives a less burdensome regulation would save, and at what cost. Furthermore the EPA, when calculating the benefits of its ban, explicitly refused to compare it to an improved workplace in which currently available control technology is utilized. See 54 Fed.Reg. at 29,474. This decision artificially inflated the purported benefits of the rule by using a baseline comparison substantially *1217 lower than what currently available technology could yield.

[27] Under TSCA, the EPA was required to evaluate, rather than ignore, less burdensome regulatory alternatives. TSCA imposes a least-to-most-burdensome hierarchy. In order to impose a regulation at the top of the hierarchy--a total ban of asbestos--the EPA must show not only that its proposed action reduces the risk of the product to an adequate level, but also that the actions Congress identified as less burdensome also would not do the job. [FN17] The failure of the EPA to do this constitutes a failure to meet its burden of showing that its actions not only reduce the risk but do so in the Congressionally-mandated least burdensome fashion.

FN17. Although we, as always, rely mainly upon the language of the statute to determine Congress's intent, we also note that the legislative history of TSCA supports the notion of TSCA's least-to-most-burdensome hierarchy. As the Senate sponsor of the "least burdensome" requirement stated, Congress did "not want to give the Administrator unlimited authority and let him say, 'I will impose this control, if there are other controls that are effective and are less burdensome on the industry.'" 122 Cong.Rec. 8295 (1976) (statement of Sen. Cannon).

In addition, the EPA itself acknowledges this hierarchy when it states in its brief that "TSCA authorizes and directs [the] EPA to impose that burden [of a total ban] if the risks of a substance cannot be adequately addressed in another way." (Emphasis added.) The EPA does not explain how it can determine that the risks of a substance cannot be addressed in another way if it refuses to make a finding that the alternatives will not discharge the EPA's TSCA burden. It cannot simply state that there is no level of zero risk asbestos use and then impose the most burdensome alternative on that sole basis.

Thus it was not enough for the EPA to show, as it did in this case, that banning some asbestos products might reduce the harm that could occur from the use of these products. If that were the standard, it would be no standard at all, for few indeed are the products that are so safe that a complete ban of them would not make the world still safer.

This comparison of two static worlds is insufficient to satisfy the dictates of TSCA. While the EPA may have shown that a world with a complete ban of asbestos might be preferable to one in which there is only the current amount

of regulation, the EPA has failed to show that there is not some intermediate state of regulation that would be superior to both the currently-regulated and the completely-banned world. Without showing that asbestos regulation would be ineffective, the EPA cannot discharge its TSCA burden of showing that its regulation is the least burdensome available to it.

Upon an initial showing of product danger, the proper course for the EPA to follow is to consider each regulatory option, beginning with the least burdensome, and the costs and benefits of regulation under each option. The EPA cannot simply skip several rungs, as it did in this case, for in doing so, it may skip a less-burdensome alternative mandated by TSCA. Here, although the EPA mentions the problems posed by intermediate levels of regulation, it takes no steps to calculate the costs and benefits of these intermediate levels. See 54 Fed.Reg. at 29,462, 29,474. Without doing this it is impossible, both for the EPA and for this court on review, to know that none of these alternatives was less burdensome than the ban in fact chosen by the agency.

The EPA's offhand rejection of these intermediate regulatory steps is "not the stuff of which substantial evidence is made." *Aqua Slide*, 569 F.2d at 843

While it is true that the EPA considered five different ban options, these differed solely with respect to their effective dates. The EPA did not calculate the risk levels for intermediate levels of regulation, as it believed that there was no asbestos exposure level for which the risk of injury or death was zero. Reducing risk to zero, however, was not the task that Congress set for the EPA in enacting TSCA. The EPA thus has failed "cogently [to] explain why it has exercised its discretion in a given manner," *Chemical Mfrs. Ass'n*, 899 F.2d at 349, by failing to explore in more than a cursory way the less burdensome alternatives to a total ban.

*1218 2.

The EPA's Calculations.

Furthermore, we are concerned about some of the methodology employed by the EPA in making various of the calculations that it did perform. In order to aid the EPA's reconsideration of this and other cases, we present our concerns here.

[28] First, we note that there was some dispute in the record regarding the appropriateness of discounting the perceived benefits of the EPA's rule. In choosing between the calculated costs and benefits, the EPA presented variations in which it discounted only the costs, and counter-variations in which it discounted both the costs and the benefits, measured in both monetary and human injury terms. As between these two variations, we choose to evaluate the EPA's work using its discounted benefits calculations.

Although various commentators dispute whether it ever is appropriate to discount benefits when they are measured in human lives, we note that it would skew the results to discount only costs without according similar treatment to the benefits side of the equation. Adopting the position of the commentators who advocate not discounting benefits would force the EPA similarly not to calculate costs in present discounted real terms, making comparisons difficult. Furthermore, in evaluating situations in which different options incur costs at varying time intervals, the EPA would not be able to take into account that soon-to-be-incurred costs are more harmful than postponable costs. Because the EPA must discount costs to perform its evaluations properly, the EPA also should discount benefits to preserve an apples-to-apples comparison, even if this entails discounting benefits of a

non-monetary nature. See *What Price Posterity?*, *The Economist*, March 23, 1991, at 73 (explaining use of discount rates for non-monetary goods).

When the EPA does discount costs or benefits, however, it cannot choose an unreasonable time upon which to base its discount calculation. Instead of using the time of injury as the appropriate time from which to discount, as one might expect, the EPA instead used the time of exposure.

The difficulties inherent in the EPA's approach can be illustrated by an example. Suppose two workers will be exposed to asbestos in 1995, with worker X subjected to a tiny amount of asbestos that will have no adverse health effects, and worker Y exposed to massive amounts of asbestos that quickly will lead to an asbestos-related disease. Under the EPA's approach, which takes into account only the time of exposure rather than the time at which any injury manifests itself, both examples would be treated the same. The EPA's approach implicitly assumes that the day on which the risk of injury occurs is the same day the injury actually occurs. [FN18] Such an approach might be proper when the exposure and injury are one and the same, such as when a person is exposed to an immediately fatal poison, but is inappropriate for discounting toxins in which exposure often is followed by a substantial lag time before manifestation of injuries. [FN19]

FN18. Recently, in a different context, we observed the important distinction between present and future injury. See *Willett v. Baxter Int'l, Inc.*, 929 F.2d 1094, 1099-1100 & n. 20 (5th Cir.1991).

FN19. We also note that the EPA chose to use a real discount rate of 3%.

Because historically the real rate of interest has tended to vary between 2% and 4%, this figure was not inaccurate. The EPA also did not err by calculating that the price of substitute goods is likely to decline at a rate of 1% per year, resulting from economies of scale and increasing manufacturing prowess. Because the EPA properly limited the scope of these declines in its models so that the cost of substitutes would not decline so far as to make the price of the substitutes less than the cost of the asbestos they were forced to replace, this was not an unreasonable real rate of price decline to adopt.

Of more concern to us is the failure of the EPA to compute the costs and benefits of its proposed rule past the year 2000, and its double-counting of the costs of asbestos use. In performing its calculus, the EPA only included the number of lives saved over the next thirteen years, and counted any additional lives saved as simply "unquantified benefits." 54 Fed.Reg. at 29,486. *1219 The EPA and intervenors now seek to use these unquantified lives saved to justify calculations as to which the benefits seem far outweighed by the astronomical costs. For example, the EPA plans to save about three lives with its ban of asbestos pipe, at a cost of \$128-227 million (i.e., approximately \$43-76 million per life saved). Although the EPA admits that the price tag is high, it claims that the lives saved past the year 2000 justify the price. See generally *id.* at 29,473 (explaining use of unquantified benefits).

Such calculations not only lessen the value of the EPA's cost analysis, but also make any meaningful judicial review impossible. While TSCA contemplates a useful place for unquantified benefits beyond the EPA's calculation, unquantified benefits never were intended as a trump card allowing the EPA to justify any cost calculus, no matter how high.

The concept of unquantified benefits, rather, is intended to allow the EPA to provide a rightful place for any remaining benefits that are impossible to quantify after the EPA's best attempt, but which still are of some concern. But the allowance for unquantified costs is not intended to allow the EPA to perform its calculations over an arbitrarily short period so as to preserve a large unquantified portion.

Unquantified benefits can, at times, permissibly tip the balance in close cases. They cannot, however, be used to effect a wholesale shift on the balance beam. Such a use makes a mockery of the requirements of TSCA that the EPA weigh the costs of its actions before it chooses the least burdensome alternative. [FN20]

FN20. We thus reject the arguments made by the Natural Resources Defense Council, Inc., and the Environmental Defense Fund, Inc., that the EPA's decision can be justified because the EPA "relied on many serious risks that were understated or not quantified in the final rule," presented figures in which the "benefits are calculated only for a limited time period," and undercounted the risks to the general population from low-level asbestos exposure. In addition, the intervenors argue that the EPA rejected using upper estimates, see 54 Fed.Reg. at 29,473, and that this court now should use the rejected limits as evidence to support the EPA. They thus would have us reject the upper limit concerns when they are not needed, but use them if necessary. We agree that these all are valid concerns that the EPA legitimately should take into account when considering regulatory action. What we disagree with, however, is the manner in which the EPA incorporated these concerns. By not using such concerns in its quantitative analysis, even where doing so was not difficult, and reserving them as additional factors to buttress the ban, the EPA improperly transformed permissible considerations into determinative factors.

We do not today determine what an appropriate period for the EPA's calculations would be, as this is a matter better left for agency discretion. See *Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 53, 103 S.Ct. at 2872. We do note, however, that the choice of a thirteen-year period is so short as to make the unquantified period so unreasonably large that any EPA reliance upon it must be displaced.

Under the EPA's calculations, a twenty-year-old worker entering employment today still would be at risk from workplace dangers for more than thirty years after the EPA's analysis period had ended. The true benefits of regulating asbestos under such calculations remain unknown. The EPA cannot choose to leave these benefits high and then use the high unknown benefits as a major factor justifying EPA action.

We also note that the EPA appears to place too great a reliance upon the concept of population exposure. While a high population exposure certainly is a factor that the EPA must consider in making its calculations, the agency cannot count such problems more than once. For example, in the case of asbestos brake products, the EPA used factors such as risk and exposure to calculate the probable harm of the brakes, and then used, as an additional reason to ban the products, the fact that the exposure levels were high. Considering that calculations of the probable harm level, when reduced to basics, simply are a calculation of population risk multiplied by population exposure, the EPA's redundant use of population exposure to justify its

actions cannot stand.

*1220 3.

Reasonable Basis.

In addition to showing that its regulation is the least burdensome one necessary to protect the environment adequately, the EPA also must show that it has a reasonable basis for the regulation. 15 U.S.C. <section> 2605(a). To some extent, our inquiry in this area mirrors that used above, for many of the methodological problems we have noted also indicate that the EPA did not have a reasonable basis. We here take the opportunity to highlight some areas of additional concern.

[29] Most problematical to us is the EPA's ban of products for which no substitutes presently are available. In these cases, the EPA bears a tough burden indeed to show that under TSCA a ban is the least burdensome alternative, as TSCA explicitly instructs the EPA to consider "the benefits of such substance or mixture for various uses and the availability of substitutes for such uses." Id. <section> 2605(c)(1)(C). These words are particularly appropriate where the EPA actually has decided to ban a product, rather than simply restrict its use, for it is in these cases that the lack of an adequate substitute is most troubling under TSCA.

As the EPA itself states, "[w]hen no information is available for a product indicating that cost-effective substitutes exist, the estimated cost of a product ban is very high." 54 Fed.Reg. at 29,468. Because of this, the EPA did not ban certain uses of asbestos, such as its use in rocket engines and battery separators. The EPA, however, in several other instances, ignores its own arguments and attempts to justify its ban by stating that the ban itself will cause the development of low-cost, adequate substitute products.

[30] As a general matter, we agree with the EPA that a product ban can lead to great innovation, and it is true that an agency under TSCA, as under other regulatory statutes, "is empowered to issue safety standards which require improvements in existing technology or which require the development of new technology." *Chrysler Corp. v. Department of Transp.*, 472 F.2d 659, 673 (6th Cir.1972). As even the EPA acknowledges, however, when no adequate substitutes currently exist, the EPA cannot fail to consider this lack when formulating its own guidelines. Under TSCA, therefore, the EPA must present a stronger case to justify the ban, as opposed to regulation, of products with no substitutes.

We note that the EPA does provide a waiver provision for industries where the hoped-for substitutes fail to materialize in time. See 54 Fed.Reg. at 29,464. Under this provision, if no adequate substitutes develop, the EPA temporarily may extend the planned phase-out.

The EPA uses this provision to argue that it can ban any product, regardless of whether it has an adequate substitute, because inventive companies soon will develop good substitutes. The EPA contends that if they do not, the waiver provision will allow the continued use of asbestos in these areas, just as if the ban had not occurred at all.

The EPA errs, however, in asserting that the waiver provision will allow a continuation of the status quo in those cases in which no substitutes materialize. By its own terms, the exemption shifts the burden onto the waiver proponent to convince the EPA that the waiver is justified. See *id.* As even the EPA acknowledges, the waiver only "may be granted by [the] EPA in

very limited circumstances." Id. at 29,460.

The EPA thus cannot use the waiver provision to lessen its burden when justifying banning products without existing substitutes. While TSCA gives the EPA the power to ban such products, the EPA must bear its heavier burden of justifying its total ban in the face of inadequate substitutes. Thus, the agency cannot use its waiver provision to argue that the ban of products with no substitutes should be treated the same as the ban of those for which adequate substitutes are available now.

[31] We also are concerned with the EPA's evaluation of substitutes even in those instances in which the record shows *1221 that they are available. The EPA explicitly rejects considering the harm that may flow from the increased use of products designed to substitute for asbestos, even where the probable substitutes themselves are known carcinogens. Id. at 29,481-83. The EPA justifies this by stating that it has "more concern about the continued use and exposure to asbestos than it has for the future replacement of asbestos in the products subject to this rule with other fibrous substitutes." Id. at 29,481. The agency thus concludes that any "[r]egulatory decisions about asbestos which poses well-recognized, serious risks should not be delayed until the risk of all replacement materials are fully quantified." Id. at 29,483.

This presents two problems. First, TSCA instructs the EPA to consider the relative merits of its ban, as compared to the economic effects of its actions. The EPA cannot make this calculation if it fails to consider the effects that alternate substitutes will pose after a ban.

Second, the EPA cannot say with any assurance that its regulation will increase workplace safety when it refuses to evaluate the harm that will result from the increased use of substitute products. While the EPA may be correct in its conclusion that the alternate materials pose less risk than asbestos, we cannot say with any more assurance than that flowing from an educated guess that this conclusion is true.

Considering that many of the substitutes that the EPA itself concedes will be used in the place of asbestos have known carcinogenic effects, the EPA not only cannot assure this court that it has taken the least burdensome alternative, but cannot even prove that its regulations will increase workplace safety. Eager to douse the dangers of asbestos, the agency inadvertently actually may increase the risk of injury Americans face. The EPA's explicit failure to consider the toxicity of likely substitutes thus deprives its order of a reasonable basis. Cf. *American Petroleum Inst. v. OSHA*, 581 F.2d 493, 504 (5th Cir.1978) (An agency is required to "regulate on the basis of knowledge rather than the unknown.").

Our opinion should not be construed to state that the EPA has an affirmative duty to seek out and test every workplace substitute for any product it seeks to regulate. TSCA does not place such a burden upon the agency. We do not think it unreasonable, however, once interested parties introduce credible studies and evidence showing the toxicity of workplace substitutes, or the decreased effectiveness of safety alternatives such as non-asbestos brakes, that the EPA then consider whether its regulations are even increasing workplace safety, and whether the increased risk occasioned by dangerous substitutes makes the proposed regulation no longer reasonable. In the words of the EPA's own release that initiated the asbestos rulemaking, we direct that the agency consider the adverse health effects of asbestos substitute

"for comparison with the known hazards of asbestos," so that it can conduct, as it promised in 1979, a "balanced consideration of the environmental, economic, and social impact of any action taken by the agency." 44 Fed.Reg. at 60,065 (1979).

[32] In short, a death is a death, whether occasioned by asbestos or by a toxic substitute product, and the EPA's decision not to evaluate the toxicity of known carcinogenic substitutes is not a reasonable action under TSCA. Once an interested party brings forth credible evidence suggesting the toxicity of the probable or only alternatives to a substance, the EPA must consider the comparative toxic costs of each. [FN21] Its failure to do so in this case thus *1222 deprived its regulation of a reasonable basis, at least in regard to those products as to which petitioners introduced credible evidence of the dangers of the likely substitutes. [FN22]

FN21. This is not to say that an interested party can introduce just any evidence of a suspected carcinogen or other toxin in its efforts to slow down a valid EPA regulation. The agency may, within its discretion, consider the probable merits of such dilatory tactics and act appropriately. Cf. National Grain & Feed Ass'n, 866 F.2d at 734 ("[W]e do not require the agency to respond in detail to every imaginable proposal for tighter standards."). Where, however, the health risks of substitutes, such as non-asbestos brakes and polyvinyl chloride (PVC) pipe, are both plausible and known, the EPA must consider not only the probable costs of continued use of the product it is considering, but also the harm that would follow from its regulation and increased use of an alternate, harmful product.

FN22. We note that at least part of the EPA's arguments rest on the assumption that regulation will not work because the federal government will not adequately enforce any workplace standards that the EPA might promulgate. This is an improper assumption. The EPA should assume reasonable efforts by the government to implement its own regulations. A governmental agency cannot point to how poorly the government will implement regulations as a reason to reject regulation. Rather, the solution to poor enforcement of regulations is better enforcement, not more burdensome alternative solutions under TSCA.

4.

Unreasonable Risk of Injury.

The final requirement the EPA must satisfy before engaging in any TSCA rulemaking is that it only take steps designed to prevent "unreasonable" risks. In evaluating what is "unreasonable," the EPA is required to consider the costs of any proposed actions and to "carry out this chapter in a reasonable and prudent manner [after considering] the environmental, economic, and social impact of any action." 15 U.S.C. <section> 2601(c).

[33] As the District of Columbia Circuit stated when evaluating similar language governing the Federal Hazardous Substances Act, "[t]he requirement that the risk be 'unreasonable' necessarily involves a balancing test like that familiar in tort law: The regulation may issue if the severity of the injury that may result from the product, factored by the likelihood of the injury, offsets the harm the regulation itself imposes upon manufacturers and consumers." *Forester v. CPSC*, 559 F.2d 774, 789 (D.C.Cir.1977). We have quoted this language approvingly when evaluating other statutes using similar language. See, e.g., *Aqua Slide*, 569 F.2d at 839.

That the EPA must balance the costs of its regulations against their benefits further is reinforced by the requirement that it seek the least burdensome regulation. While Congress did not dictate that the EPA engage in an exhaustive, full-scale cost-benefit analysis, it did require the EPA to consider both sides of the regulatory equation, and it rejected the notion that the EPA should pursue the reduction of workplace risk at any cost. See *American Textile Mfrs. Inst.*, 452 U.S. at 510 n. 30, 101 S.Ct. at 2491 n. 30 ("unreasonable risk" statutes require "a generalized balancing of costs and benefits" (citing *Aqua Slide*, 569 F.2d at 839)). Thus, "Congress also plainly intended the EPA to consider the economic impact of any actions taken by it under ... TSCA." *Chemical Mfrs. Ass'n*, 899 F.2d at 348.

Even taking all of the EPA's figures as true, and evaluating them in the light most favorable to the agency's decision (non-discounted benefits, discounted costs, analogous exposure estimates included), the agency's analysis results in figures as high as \$74 million per life saved. For example, the EPA states that its ban of asbestos pipe will save three lives over the next thirteen years, at a cost of \$128-227 million (\$43-76 million per life saved), depending upon the price of substitutes; that its ban of asbestos shingles will cost \$23-34 million to save 0.32 statistical lives (\$72-106 million per life saved); that its ban of asbestos coatings will cost \$46-181 million to save 3.33 lives (\$14-54 million per life saved); and that its ban of asbestos paper products will save 0.60 lives at a cost of \$4-5 million (\$7-8 million per life saved). See 54 Fed.Reg. at 29,484-85. Were the analogous exposure estimates not included, the cancer risks from substitutes such as ductile iron pipe factored in, and the benefits of the ban appropriately discounted from the time of the manifestation of an injury rather than the time of exposure, the costs would shift even more sharply against the EPA's position.

While we do not sit as a regulatory agency that must make the difficult decision as to what an appropriate expenditure is to prevent someone from incurring the risk of *1223 an asbestos-related death, we do note that the EPA, in its zeal to ban any and all asbestos products, basically ignored the cost side of the TSCA equation. The EPA would have this court believe that Congress, when it enacted its requirement that the EPA consider the economic impacts of its regulations, thought that spending \$200-300 million to save approximately seven lives (approximately \$30-40 million per life) over thirteen years is reasonable.

As we stated in the OSHA context, until an agency "can provide substantial evidence that the benefits to be achieved by [a regulation] bear a reasonable relationship to the costs imposed by the reduction, it cannot show that the standard is reasonably necessary to provide safe or healthful workplaces." *American Petroleum Inst.*, 581 F.2d at 504. Although the OSHA statute differs in major respects from TSCA, the statute does require substantial evidence to support the EPA's contentions that its regulations both have a reasonable basis and are the least burdensome means to a reasonably safe workplace.

The EPA's willingness to argue that spending \$23.7 million to save less than one-third of a life reveals that its economic review of its regulations, as required by TSCA, was meaningless. As the petitioners' brief and our review of EPA caselaw reveals, such high costs are rarely, if ever, used to support a safety regulation. If we were to allow such cavalier treatment of the EPA's duty to consider the economic effects of its decisions, we would have to excise entire sections and phrases from the language of TSCA. Because we are judges, not surgeons, we decline to do so. [FN23]

FN23. See Environmental Defense Fund, 636 F.2d at 1275 n. 17 ("[W]e must construe the statute 'so that no provision will be inoperative or superfluous' " (quoting Motor & Equip. Mfrs. Ass'n v. EPA, 627 F.2d 1095, 1108 (D.C.Cir.1979), cert. denied, 446 U.S. 952, 100 S.Ct. 2917, 64 L.Ed.2d 808 (1980))); see also Old Colony R.R. v. Commissioner, 284 U.S. 552, 560, 52 S.Ct. 211, 213, 76 L.Ed. 484 (1932) (in interpreting statutory language, "the plain, obvious and rational meaning of a statute is to be preferred to any curious, narrow, hidden sense"). As the petitioners point out, the EPA regularly rejects, as unjustified, regulations that would save more lives at less cost. For example, over the next 13 years, we can expect more than a dozen deaths from ingested toothpicks--a death toll more than twice what the EPA predicts will flow from the quarter-billion-dollar bans of asbestos pipe, shingles, and roof coatings. See L. Budnick, Toothpick-Related Injuries in the United States, 1979 Through 1982, 252 J. Am. Med. Ass'n, Aug. 10, 1984, at 796 (study showing that toothpick-related deaths average approximately one per year).

V.

Substantial Evidence Regarding Least Burdensome, Adequate Regulation.

TSCA provides that a reviewing court "shall hold unlawful and set aside" a final rule promulgated under section 6(a) "if the court finds that the rule is not supported by substantial evidence in the rulemaking record ... taken as a whole." 15 U.S.C. <section> 2618(c)(1)(B)(i). The substantial evidence standard "afford[s] a considerably more generous judicial review" than the arbitrary or capricious test, Abbott Laboratories, 387 U.S. at 143, 87 S.Ct. at 1513, and "imposes a considerable burden on the agency and limits its discretion in arriving at a factual predicate." Mobil Oil Corp. v. FPC, 483 F.2d 1238, 1258 (D.C.Cir.1973).

[34] We have declared that the EPA must articulate an "understandable basis" to support its TSCA action with respect to each substance or application of the substance banned. Chemical Mfrs. Ass'n, 899 F.2d at 357. To make a finding of unreasonable risk based upon this assessment, the "EPA must balance the probability that harm will occur from the activities against the effects of the proposed regulatory action on the availability to society of the benefits of asbestos." 54 Fed.Reg. at 29,467. With these edicts in mind, we now examine each product against the TSCA criteria. [FN24]

FN24. In large part, our analysis draws upon our general discussion already concluded. Where necessary, however, we develop specific themes more appropriately addressed in the context of a specific product. The EPA on subsequent review should consider these specific comments as applicable to its procedures dealing with other products, where necessary. In other words, by presenting a concern in the context of one product, we do not mean to imply that it arises only in that area.

*1224 A.

Friction Products.

[35] We begin our analysis with the EPA's ban of friction products, which constitutes the lion's share of the proposed benefits of the asbestos regulation--nearly three-fourths of the anticipated asbestos deaths. The friction products in question, although primarily made up of drum and disk brakes, also include brake blocks and other friction products.

Workers are exposed to asbestos during the manufacture, use, repair, and disposal of these products. The EPA banned most of these products with a stage 2 ban, which would require companies to cease manufacturing or importing the products by August 25, 1993, with distribution to end one year later. The final stage 3 ban would ban any remaining friction products on August 26, 1996, with distribution again ceasing one year later. See *id.* at 29,461-62.

We note that of all the asbestos bans, the EPA did the most impressive job in this area, both in conducting its studies and in supporting its contention that banning asbestos products would save over 102 discounted lives. *Id.* at 29,48 5. Furthermore, the EPA demonstrates that the population exposure to asbestos in this area is great, while the estimated cost of the measure is low, at least in comparison to the cost-per-life of its other bans. Were the petitioners only questioning the EPA's decision to ban friction products based upon disputing these figures, we would be tempted to uphold the EPA, even in the face of petitioners' arguments that workplace exposure to friction product asbestos could be decreased by as much as ninety percent using stricter workplace controls and in light of studies supporting the conclusion that some forms of asbestos present less danger. Decisions such as these are better left to the agency's expertise.

Such expertise, however, is not a universal talisman affording the EPA unbridled latitude to act as it chooses under TSCA. What we cannot ignore is that the EPA failed to study the effect of non-asbestos brakes on automotive safety, despite credible evidence that non-asbestos brakes could increase significantly the number of highway fatalities, and that the EPA failed to evaluate the toxicity of likely brake substitutes. As we already mentioned, the EPA, in its zeal to ban asbestos, cannot overlook, with only cursory study, credible contentions that substitute products actually might increase fatalities.

The EPA commissioned an American Society of Mechanical Engineers (ASME) study that concluded that while more research was needed, it appeared that many of the proposed substitutes for friction products are not, and will, not soon be available, especially in the replacement brake market, and that the substitutes may or may not assure safety. [FN25] Despite this credible record evidence, by a study specifically commissioned by the EPA, that substitute products actually might cause more deaths than those asbestos deaths predicted by the EPA, the agency did not evaluate the dangers posed by the substitutes, including cancer deaths from the other fibers used and highway deaths occasioned by less effective, non-asbestos brakes. This failure to examine the likely consequence of the EPA's regulation renders the ban of asbestos friction products unreasonable.

FN25. One of the study's authors, Mr. Anderson, submitted written testimony that the "replacement/substitution of asbestos-based with non-asbestos brake linings will produce grave risks" and that "the expected increase of skid-related highway accidents and resultant traffic deaths would certainly be expected to overshadow any potential health-related benefits of fiber substitution." The ASME report itself concludes only that "[i]f the eventual elimination of all asbestos in friction products is to be accomplished, additional future studies are required." This is an insufficient basis upon which to support the EPA's judgment that non-asbestos brakes are just as safe as asbestos brakes.

This failure would be of little moment, were the relevant market confined to

original equipment disk brakes and pads. For these original equipment brakes, it appears that manufacturers already have developed safe substitutes for asbestos, considering *1225 that nearly all new vehicles come with non-asbestos disk brakes, with non-asbestos drum brakes apparently soon to follow. See *id.* at 29,493. The ASME Report concluded that "at the present rate of technological progress, most new passenger cars could be equipped with totally non-asbestos frictional systems by 1991, and most light trucks and heavy trucks with S-cam brakes, by 1992." See *id.* at 29,494.

Although the petitioners dispute the evidence, we find particularly telling the fact that manufacturers already are producing most vehicles with newly designed, non-asbestos brakes. The ban of asbestos brakes for these uses here appears reasonable and, had the EPA taken the proper steps to consider and reject the less burdensome alternatives, we might find the ban of these products supported by substantial evidence.

With respect to the aftermarket replacement market, however, the EPA's failure to consider the safety ramifications of its decisions is problematic. Original equipment, non-asbestos brakes are designed from the start to work without the superior insulating properties of asbestos. The replacement market brakes, on the other hand, were designed with asbestos, rather than substitutes, in mind. As the EPA itself states, "[c]ommenters generally agreed that it is easier to develop replacement asbestos-free friction materials for use in vehicles that are intentionally designed to use such materials than it is to develop asbestos-free friction materials for use as after-market replacement products in vehicles currently in use that have brake systems designed to use asbestos." *Id.* Because of these difficulties, the EPA decided to use a stage 3 ban for replacement brakes.

Despite acknowledging the difficulty of retrofitting current asbestos brakes, however, the EPA decided that the problem with non-asbestos brakes was not that they are inferior, but that they are less safe because the government does not regulate them. Based upon this conclusion, the EPA decided that it need not consider the safety of alternative brakes because, after consultation with the National Highway Traffic Safety Administration (NHTSA), the EPA concluded that regulation of non-asbestos brakes soon would be forthcoming. *Id.*

This determination is insufficient to discharge the EPA's duties under TSCA. The EPA failed to settle whether alternative brakes will be as safe as current brakes, even though, by its own admission, the "EPA also acknowledges that a ban on asbestos in the brake friction product categories may increase the uncertainty about brake performance." *Id.* at 29,495. The EPA contends that it can rely upon NHTSA to discharge its regulatory burdens, but it ignores the fact that the problem with non-asbestos brakes may be technical, rather than regulatory, in nature.

Future consideration by the NHTSA cannot support a present ban by the EPA when the record contains conflicting and non-conclusive evidence regarding the safety of non-asbestos brake replacement parts. After being presented with credible evidence "that a ban on asbestos use in the aftermarket for brake systems designed for asbestos friction products will compromise the performance of braking systems designed for asbestos brakes," *id.* at 29,494, the EPA under TSCA had to consider whether its proposed ban not only was reasonable, but also whether the increased deaths caused by less efficient brakes made the ban of asbestos in the replacement brake market unreasonable.

In short, while it is apparent that non-asbestos brake products either are available or soon will be available on new vehicles, there is no evidence indicating that forcing consumers to replace their asbestos brakes with new non-asbestos brakes as they wear out on their present vehicles will decrease fatalities or that such a ban will produce other benefits that outweigh its costs. Furthermore, many of the EPA's own witnesses conceded on cross-examination that the non-asbestos fibrous substitutes also pose a cancer risk upon inhalation, yet the EPA failed to examine in more than a cursory fashion the toxicity of these alternatives. Under these circumstances, *1226 the EPA has failed to support its ban with the substantial evidence needed to provide it with a reasonable basis.

Finally, as we already have noted, the structure of TSCA requires the EPA to consider, and reject, the less burdensome alternatives in the TSCA hierarchy before it can invoke its power to ban a product completely. It may well be true, as the EPA contends, that workplace controls are insufficient measures under TSCA and that only a ban will discharge the EPA's TSCA-imposed duty to seek the safest, reasonable environment. The EPA's failure to consider the regulatory alternatives, however, cannot be substantiated by conclusory statements that regulation would be insufficient. See *Texas Indep. Ginners Ass'n v. Marshall*, 630 F.2d 398, 411-12 (5th Cir.1980); *Aqua Slide*, 569 F.2d at 843. We thus conclude that while the EPA may have presented sufficient evidence to underpin the dangers of asbestos brakes, its failure to consider whether the ban is the least burdensome alternative, and its refusal to consider the toxicity and danger of substitute brake products, in regard to both highway and workplace safety, deprived its regulation of the reasonable basis required by TSCA.

B.

Asbestos-Cement Pipe Products.

[36] The EPA's analysis supporting its ban of asbestos-cement (A/C") pipe is more troublesome than its action in regard to friction products. Asbestos pipe primarily is used to convey water in mains, sewage under pressure, and materials in various industrial process lines. Unlike most uses of asbestos, asbestos pipe is valued primarily for its strength and resistance to corrosion, rather than for its heat-resistant qualities. The EPA imposed a stage 3 ban on asbestos pipe. 54 Fed.Reg. at 29,462.

Petitioners question EPA's cost/benefit balancing, noting that by the EPA's own predictions, the ban of asbestos pipe will save only 3-4 discounted lives, at a cost ranging from \$128-227 million (\$43-76 million per life saved), depending upon the price of substitutes. *Id.* at 29,484. Furthermore, much of EPA's data regarding this product and others depends upon data received from exposures observed during activities similar to the ones to be regulated--the "analogous exposure" analysis that the EPA adopted subsequent to the public comment period, which thus was not subjected to cross-examination or other critical testing. [FN26] Finally, the petitioners protest that the EPA acted unreasonably because the most likely substitutes for the asbestos pipe, PVC and ductile iron pipe, also contain known carcinogens.

FN26. In this case, the EPA extrapolated data regarding asbestos exposure during installation of asbestos pipe products and estimated, by formula, how often workers would be exposed to asbestos during repair and disposal.

Once again we are troubled by the EPA's methodology and its evaluation of the

substitute products. Many of the objections raised by the asbestos cement pipe producers are general protests about the EPA's studies and other similar complaints. We will not disturb such agency inquiries, as it is not our role to delve into matters better left for agency expertise. We do, however, examine the EPA's methodology in places to determine whether it has presented substantial evidence to support its regulation.

As with friction products, the EPA refused to assess the risks of substitutes to asbestos pipe. *Id.* at 29,497-98. Unlike non-asbestos brakes, which the EPA contends are safe, the EPA here admits that vinyl chloride, used in PVC, is a human carcinogen that is especially potent during the manufacture of PVC pipe. As for the EPA's defense of the ductile iron pipe substitute, the EPA also acknowledges evidence that it will cause cancer deaths but rejects these deaths as overestimated, even though it can present no more support for this assumption than its own *ipse dixit*.

The EPA presented several plausible, albeit untested, reasons why PVC and ductile iron pipe might be less of a health risk than asbestos pipe. It did not, however, actually evaluate the health risk flowing from these substitute products, even though the *1227 "EPA acknowledges that the individual lifetime cancer risk associated with the production of PVC may be equivalent to that associated with the production of A/C pipe." *Id.* at 29,497. The agency concedes that "[t]he population cancer risk for the production of ductile iron pipe could be comparable to the population cancer risk for production of A/C pipe." *Id.*

It was insufficient for the EPA to conclude that while its data showed that "the number of cancer cases associated with production of equivalent amounts of ductile iron pipe and A/C pipe 'may be similar,' the estimate of cancer risk for ductile iron pipe 'is most likely an overestimate,'" see 54 Fed.Reg. at 29,498, unless the agency can present something more concrete than its own speculation to refute these earlier iron pipe cancer studies. Musings and conjecture are "not the stuff of which substantial evidence is made," *Aqua Slide*, 569 F.2d at 843, and "[u]narticulated reliance on Commission 'experience' may satisfy an 'arbitrary, capricious' standard of review, but it does not add one jot to the record evidence." *Id.* at 841-42 (citations omitted). "While expert opinion deserves to be heeded, it must be based on more than casual observation and speculation, particularly where a risk of fatal injury is being evaluated." *Id.* These concerns are of special note where the increased carcinogen risk occasioned by the EPA's proposed substitutes is both credible and known.

This conclusion only is strengthened when we consider the EPA's failure to analyze the health risks of PVC pipe, the most likely substitute for asbestos pipe, which the EPA concedes poses a cancer risk similar to that presented by asbestos pipe. The failure of the EPA to make a record finding on the risks of PVC pipe is particularly inexplicable, as the EPA already is studying increasing the stringency of PVC regulation in separate rulemaking proceedings, an action that one of the very intervenors in the instant case has been urging for years. See *NRDC v. EPA*, 824 F.2d 1146, 1148-49 (D.C.Cir.1987) (*en banc*).

The EPA, in these separate proceedings, has estimated the cancer risk from PVC plants to be as high as twenty deaths per year, a death rate that stringent controls might be able to reduce to one per year, see *id.* at 1149, far in excess of the fractions of a life that the asbestos pipe ban may save each year, by the EPA's own calculations. Considering that the EPA concedes

that there is no evidence showing that ingested, as opposed to inhaled, asbestos is a health risk, while the EPA's own studies show that ingested vinyl chloride is a significant cancer risk that could cause up to 260 cancer deaths over the next thirteen years, see *id.*; 54 Fed.Reg. at 29,498, the EPA's failure to consider the risks of substitute products in the asbestos pipe area is particularly troublesome. The agency cannot simply choose to note the similar cancer risks of asbestos and iron pipe and then reject the data underpinning the iron and PVC pipe without more than its own conclusory statements.

We also express concern with the EPA's cavalier attitude toward the use of its own data. The asbestos pipe industry argues that the exposure times the EPA used to calculate its figures are much higher than experience would warrant, a contention that the EPA now basically concedes. Rather than recalculate its figures, however, based upon the best data available to it, the EPA merely responds that while the one figure may be too high, it undoubtedly underestimated the exposure levels, because contractors seldom comply with OSHA regulations. In the words of its brief, "[t]hus, EPA concluded that its estimates contain both over- and underestimates, but nevertheless represented a reasonable picture of aggregate exposure."

The EPA is required to support its analysis with substantial evidence under TSCA. When one figure is challenged, it cannot back up its position by changing an unrelated figure to yield the same result. Allowing such behavior would require us only to focus on the final numbers provided by an agency, and to ignore how it arrives at that number. Because a conclusion is no better than the methodology used to reach it, such a result cannot survive the substantial evidence test.

*1228 Finally, we once again note that the EPA failed to discharge its TSCA-mandated burden that it consider and reject less burdensome alternatives before it impose a more burdensome alternative such as a complete ban. The EPA instead jumped immediately to the ban provision, without calculating whether a less burdensome alternative might accomplish TSCA's goals. See 54 Fed.Reg. at 29,489. We therefore conclude that the EPA failed to present substantial evidence to support its ban of asbestos pipe.

C.

Gaskets, Roofing, Shingles, and Paper Products.

We here deal with the remaining products affected by the EPA ban. Petitioners challenge the basis for the EPA's finding that beater-add and sheet gaskets, primarily used in automotive parts, should be banned. The agency estimated its ban would save thirty-two lives over a thirteen-year time span, at an overall cost of \$207-263 million (\$6-8 million per life saved). *Id.* at 29,484.

We have little to add in this area, beyond our general discussion and comments on other products, apart from a brief highlight of the EPA's use of analogous exposure data to support its gasket ban. For these products, the analogous exposure estimate constituted almost eighty percent of the anticipated total benefits--a proportion so large that the EPA's duty to give interested parties notice that it intended to use analogous exposure estimates was particularly acute. [FN27] Considering some of the EPA's support for its analogous exposure estimates--such as its assumption that none of the same workers who install beater-add and sheet gaskets ever is involved in repairing or disposing of them, and the unexplained discrepancy between its present conclusion that over 50,000 workers are involved in this area and its 1984

estimate that only 768 workers are involved in "gasket removal and installation," see 51 Fed.Reg. 22,612, 22,665 (1986)--the petitioners' complaint that they never were afforded the opportunity to comment publicly upon these figures, or to cross-examine any EPA witnesses regarding them, is particularly telling.

FN27. The EPA estimates drop from 32.24 discounted lives to 6.68 discounted lives without the analogous exposure data.

[37] The EPA also banned roof coatings, roof shingles, non-roof coatings, and asbestos paper products. Again, we have little to add beyond our discussions already concluded, especially regarding TSCA's requirement that the EPA always choose the least burdensome alternative, whether it be workplace regulation, labeling, or only a partial ban. We note, however, that in those cases in which a complete ban would save less than one statistical life, such as those affecting asbestos paper products and certain roofing materials, the EPA has a particular need to examine the less burdensome alternatives to a complete ban.

Where appropriate, the EPA should consider our preceding discussion as applicable to their bans of these products. By following the dictates of Chemical Mfrs. Ass'n, 899 F.2d at 359, that the quantities of the regulated chemical entering into the environment be "substantial," and that the human exposure to the chemical also must be "substantial" or "significant," as well as our concerns expressed in this opinion, the EPA should be able to determine the proper procedures to follow on its reconsideration of its rule and present the cogent explanation of its actions as required under Chemical Manufacturers Association.

D.

Ban of Products Not Being Produced in the United States.

Petitioners also contend that the EPA overstepped TSCA's bounds by seeking to ban products that once were, but no longer are, being produced in the United States. We find little merit to this claim, considering that sections 5 and 6 of TSCA allow the EPA to ban a product "that presents or *1229 will present " a significant risk. (Emphasis added.)

Although petitioners correctly point out that the value of a product not being produced is not zero, as it may find some future use, and that the EPA here has banned items where the estimated risk is zero, this was not error on the part of the EPA. The numbers appear to favor petitioners only because even products with known high risks temporarily show no risk because they are not part of this country's present stream of commerce. This would soon change if the product returned, which is precisely what the EPA is trying to avoid.

Should some unlikely future use arise for these products, the manufacturers and importers have access to the waiver provision established by the EPA for just these contingencies. Under such circumstances, we will not disturb the agency's decision to ban products that no longer are being produced in or imported into the United States.

[38] Similarly, we also decide that the EPA properly can attempt to promulgate a "clean up" ban under TSCA, providing it takes the proper steps in doing so. A clean-up ban, like the asbestos ban in this case, seeks to ban all uses of a certain toxic substance, including unknown, future uses of the substance. Although there is some merit to petitioners' argument that the EPA cannot possibly evaluate the costs and benefits of banning unknown,

uninvented products, we hold that the nebulousness of these future products, combined with TSCA's language authorizing the EPA to ban products that "will" create a public risk, allows the EPA to ban future uses of asbestos even in products not yet on the market.

E.

Fundamental EPA Choices.

Finally, we note that there are many other issues raised by petitioners, such as the EPA's decision to treat all types of asbestos the same, its conclusion that various lengths of fibers present similar toxic risks, and its decision that asbestos presents similar risks even in different industries. See generally 54 Fed.Reg. at 29,470-71 (detailing differences in potency of chrysotile and other forms of asbestos and toxicity of various fiber lengths). We mention these concerns now only to reject them.

On these, and many similar points, the petitioners merely seek to have us reevaluate the EPA's initial evaluation of the evidence. While we can, and in this opinion do, question the agency's reliance upon flawed methodology and its failure to consider factors and alternatives that TSCA explicitly requires it to consider, we do not sit as a regulatory agency ourselves. Decisions such as the EPA's decision to treat various types of asbestos as presenting similar health risks properly are better left for agency determination and, while the EPA is free to reconsider its data should it so choose when it revisits this area, it also is free to adopt similar reasoning in the future.

VI.

Conclusion.

In summary, of most concern to us is that the EPA has failed to implement the dictates of TSCA and the prior decisions of this and other courts that, before it impose a ban on a product, it first evaluate and then reject the less burdensome alternatives laid out for it by Congress. While the EPA spent much time and care crafting its asbestos regulation, its explicit failure to consider the alternatives required of it by Congress deprived its final rule of the reasonable basis it needed to survive judicial scrutiny.

Furthermore, the EPA's adoption of the analogous exposure estimates during the final weeks of its rulemaking process, after public comment was concluded, rather than during the ten years during which it was considering the asbestos ban, was unreasonable and deprived the petitioners of the notice that they required in order to present their own evidence on the validity of the estimates and its data bases. By depriving the petitioners of their right to *1230 cross-examine EPA witnesses on methodology and data used to support as much as eighty percent of the proposed benefits in some areas, the EPA also violated the dictates of TSCA.

Finally, the EPA failed to provide a reasonable basis for the purported benefits of its proposed rule by refusing to evaluate the toxicity of likely substitute products that will be used to replace asbestos goods. While the EPA does not have the duty under TSCA of affirmatively seeking out and testing all possible substitutes, when an interested party comes forward with credible evidence that the planned substitutes present a significant, or even greater, toxic risk than the substance in question, the agency must make a formal finding on the record that its proposed action still is both reasonable and warranted under TSCA.

We regret that this matter must continue to take up the valuable time of the agency, parties and, undoubtedly, future courts. The requirements of TSCA,

however, are plain, and the EPA cannot deviate from them to reach its desired result. We therefore GRANT the petition for review, VACATE the EPA's proposed regulation, and REMAND to the EPA for further proceedings in light of this opinion. [FN28]

FN28. Pursuant to the Internal Operating Procedures accompanying Fifth Cir.Loc.R. 47, Judge Brown reserves the right to file a separate opinion.

On Petition for Review of a Rule of the Environmental Protection Agency.

ON MOTION FOR CLARIFICATION

Before BROWN, SMITH, and WIENER, Circuit Judges.

PER CURIAM:

[39] Respondents, the Environmental Protection Agency (EPA) and William K. Reilly, seek a clarification of the status of the phase 1, or stage 1, provisions in the challenged rule, which provisions ban, effective August 27, 1990, the manufacture, importation, and processing of asbestos-containing corrugated and flat sheet, asbestos clothing, flooring felt, pipeline wrap, roofing felt, and vinyl/asbestos floor tile, and any new uses of asbestos. See 40 C.F.R. <section><section> 763.165(a)-.167(a). The rule also requires labeling of phase 1 products after August 27, 1990, see id. <section> 763.171(a), and prohibits the distribution in commerce of such products after August 27, 1992, see id. <section> 763.169(a). See Corrosion Proof Fittings v. EPA, 947 F.2d 1201, 1208 & n. 2 (5th Cir.1991).

Respondents assert that the clarification is needed because, in part V.D of our opinion, id. at 1228-29, we have held that the EPA may "ban products that once were, but no longer are, being produced in the United States." Thus, the motion seeks clarification of the status of any products that still were being manufactured, imported, or processed on July 12, 1989, which is the date on which the final rule was issued, see 54 Fed.Reg. 29,459 (1989), but which no longer were being manufactured, imported, or processed, as a result of the phase 1 ban, on the date of our opinion, which is October 18, 1991.

The motion for clarification is GRANTED. The holding in part V.D of our opinion applies only to products that were not being manufactured, imported, or processed on July 12, 1989, the date of the rule's promulgation. To the extent, if any, that there is doubt as to whether particular products are in that category, the EPA may resolve the factual dispute on remand.

947 F.2d 1201, 60 USLW 2289, 33 ERC 1961, 22 Env'tl. L. Rep. 20,037, 22 Env'tl. L. Rep. 20,304, 1992 O.S.H.D. (CCH) P 29,558

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