

NOTES

ADOPTING PROACTIVE STANDARDS TO PROTECT AMERICANS IN INDOOR ENVIRONMENTS: VOLATILE ORGANIC COMPOUND EMISSIONS REGULATION

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INTRODUCTION

In 1993, the Colorado Department of Health issued the Adolph Coors Brewing Company a \$1.05 million fine, the largest penalty in the Department's history, for spilling beer during Coors's brewing and treatment process.¹ In 2012, a jury awarded Wayne Watson a \$7.2 million verdict against the manufacturer and distributor of his favorite microwavable popcorn, successfully holding both companies liable for the development of his respiratory illness.² Separated by nearly a decade, these two incidents are connected by millions of invisible particles. Those particles constitute the bases of both Colorado's fine against Coors—specifically the particles' detrimental effect on outdoor air quality³—and Mr. Watson's windfall—the cause of his life-altering condition.⁴ They are known as volatile organic compounds (VOCs).

VOCs are everywhere and harmless at normal levels.⁵ Yet, researchers consistently find them in exponentially higher concentrations indoors than outdoors.⁶ When exposed to these high concentrations, individuals can suffer from a plethora of negative health effects.⁷ Recent research has indicated that personal computers and printers are among the many sources of indoor VOC emissions.⁸ Despite this research and the known dangers of VOC

1. See Jennifer M. Porter et al., *Recent Developments in Energy Resources Law*, 30 TORT & INS. L.J. 340, 341 (1995).

2. See Anthony Castellano, "Popcorn Lung" Lawsuit Nets \$7.2M Award, ABC NEWS (Sept. 20, 2012), <http://abcnews.go.com/blogs/headlines/2012/09/popcorn-lung-lawsuit-nets-7-2m-award/> [<http://perma.cc/F8ZD-TQFP>].

3. See Porter, *supra* note 1, at 341.

4. Castellano, *supra* note 2.

5. See Ehsanul Kabir & Ki-Hyun Kim, *A Review of Some Representative Techniques for Controlling Indoor Volatile Organic Compounds*, 6 ASIAN J. ATMOSPHERIC ENV'T 137, 138 (2012).

6. See *An Introduction to Indoor Air Quality*, U.S. ENVTL. PROTECTION AGENCY, <http://www.epa.gov/iaq/voc.html> [<http://perma.cc/A644-U8BT>] (last visited Apr. 3, 2015) ("Concentrations of many VOCs are consistently higher indoors (up to ten times higher) than outdoors.... EPA's office of Research and Development[] ... found levels of about a dozen common organic pollutants to be 2 to 5 times higher inside homes than outside.").

7. See *infra* Part I.A.

8. See *infra* Part I.B.

emissions in indoor environments,⁹ the government does not currently regulate them. Instead, the scope of federal VOC emission regulation is limited by the concern for outdoor air quality and indoor industrial settings.¹⁰ Considering the average person in the United States spends approximately 90 percent of his or her time indoors,¹¹ this regulatory gap must be filled in a way that protects health interests and prevents degradation of indoor air quality, even if that end is accomplished under the guise of promulgating outdoor air quality standards, a more traditional focus of environmental regulation.¹²

To provide an elementary understanding of VOCs, Part I of this Note explains VOCs in greater detail and summarizes the contemporary research linking electronic appliances to their emissions. Part II investigates the traditional legislative intent behind VOC regulation while probing the shortcomings of the statutes that directly and indirectly authorize those regulations. Part III proposes an amendment to the Clean Air Act, the Cumulatively Dangerous Air Pollutant Amendment, which would expand the scope of the Environmental Protection Agency's (EPA) authority to monitor VOCs and indoor air quality. Part IV details the many benefits that would result from granting the EPA this power. Lastly, Part V of this Note acknowledges and dismisses common counterarguments to public-health-oriented amendments as well as the consequential regulations.

This Note is unique in that it addresses recent scientific developments concerning VOC emission rates from electronics and their impact on human health. Within the past decade, only one federal agency has attempted to increase its regulatory power with respect to indoor air quality.¹³ That unsuccessful proposal directly addressed the issue of emissions from appliances,¹⁴ but relied on

9. *See infra* Part I.

10. *See infra* Part II.

11. OFFICE OF AIR AND RADIATION, U.S. ENVTL. PROTECTION AGENCY, REPORT TO CONGRESS ON INDOOR AIR QUALITY VOLUME II: ASSESSMENT AND CONTROL OF INDOOR AIR POLLUTION, at i (1989). This is a dated source, but a more contemporary estimate was not found.

12. *See infra* Part II.

13. *See* Indoor Air Quality, 59 Fed. Reg. 15,968 (Apr. 5, 1994) (to be codified at 29 C.F.R. pts. 1910, 1915, 1926, 1928).

14. *Id.*

generalized findings contemporary research, identifying specific levels and origins of indoor VOC emissions.¹⁵ That proposal has since become antiquated. Outside of this Note, no academic attempt has been made to effectuate a change within the Clean Air Act that would allow regulations on emissions of electronic appliances in both industrial and nonindustrial settings. Regulation of indoor air quality in nonindustrial settings is particularly important in the twenty-first century, when Americans spend minimal time outdoors, and when the quest for cleaner air could result in healthier, more productive people.

I. VOLATILE ORGANIC COMPOUNDS

The definition of “Volatile Organic Compound” varies depending on the context. Apart from explaining what “VOC” means, this Part briefly delves into common VOC sources, their effects on health, and, paramount of all, the progression of research that identifies certain electronic appliances as definitive producers of VOC emissions.

A. *What Are Volatile Organic Compounds?*

Scientifically defined, a VOC is any “chemical compound that contains at least one carbon [atom] and a hydrogen atom in its molecular structure [whose] boiling point [] ranges between 50°C and 260°C.”¹⁶ The legal definition of a VOC narrows that broad classification, albeit slightly. According to the Code of Federal Regulations, a VOC is “any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and

15. See *infra* Part I.B.

16. A.P. Jones, *Indoor Air Quality and Health*, 33 ATMOSPHERIC ENV'T 4535, 4547 (1999); see also JONATHAN WILLIAMS & RALF KOPPMANN, *Volatile Organic Compounds in the Atmosphere: An Overview*, in VOLATILE ORGANIC COMPOUNDS IN THE ATMOSPHERE 1, 1 (Ralf Koppmann ed., 2007) (“VOCs are considered to be those organic compounds having a vapour pressure greater than 10 Pa at 25°C, a boiling point of up to 260°C at atmospheric pressure, and 15 or less carbon atoms.”).

ammonium carbonate, which participates in atmospheric photochemical reactions.”¹⁷

The EPA’s Indoor Air Quality Guide for Health Professionals provides an even more user-friendly definition of VOCs: chemical compounds that “[a]t room temperature, ... emitted as gases from certain solids or liquids.”¹⁸ That guide continues to explain that thousands of products used during “home, office, [and] school ... activities” emit VOCs.¹⁹ Some of the more common sources of VOCs are perfumes, hair sprays, finishes, rug and oven cleaners, paints, lacquers, paint strippers, pesticides, building materials, home furnishings, copiers, printers, correction fluids, glues, and even permanent markers.²⁰ Clearly, VOCs are everywhere.

Overexposure to VOCs can result in a variety of symptoms whose spectrum ranges from minor annoyances to lethal reactions. Included in that spectrum are eye, nose, and throat irritations, headaches, nausea, vomiting, and even death.²¹ Particularly disturbing is the fact that most VOCs are invisible and odorless, and humans are unable to detect their presence.²² Consequently, many products that emit VOCs carry precautionary labels and instructions for procedures of safe use.²³

B. Consumer Appliances as Sources of VOC Emissions

Traditionally, outdoor air pollution has been at the epicenter of media-driven environmental disputes, and as a result, the primary

17. 40 C.F.R. § 51.100(s) (2014). A photochemical reaction is a chemical reaction initiated by the absorption of energy in the form of light. Jack R. Plimmer, *Principle of Photodecomposition of Pesticides*, in DEGRADATION OF SYNTHETIC ORGANIC MOLECULES IN THE BIOSPHERE 280 (1971).

18. See AM. LUNG ASS’N ET AL., INDOOR AIR POLLUTION: AN INTRODUCTION FOR HEALTH PROFESSIONALS 13 (1994), available at <http://perma.cc/3S4X-RX99>.

19. *Id.*

20. *Id.* Other authorities list combustion appliances and potable water as sources of VOCs. See Jones, *supra* note 16, at 4547-48.

21. See AM. LUNG ASS’N ET AL., *supra* note 18, at 13 (discussing other symptoms, such as conjunctival irritation, allergic reactions, dyspnea, declines in serum cholinesterase levels, epistaxis, fatigue and dizziness).

22. See Thomas F. Icard, Jr. & Wm. Cary Wright, *Sick Building Syndrome and Building-Related Illness Claims Defining the Practical and Legal Issues*, 1 CONSTRUCTION LAW. 26, 26 (1994).

23. See AM. LUNG ASS’N ET AL., *supra* note 18, at 13.

focus of environmental research.²⁴ However, starting in the 1980s, the scientific community began shifting its attention to the air people breathe inside of buildings.²⁵ Most of those early studies examined Sick Building Syndrome, a phenomena that occurs when the pollution levels inside a building increase to the point that the building itself becomes unhealthy and dangerous to its occupants.²⁶ Accordingly, early researchers conducted their tests in active office buildings, making it difficult to identify single sources of air pollution with any degree of certainty.²⁷ For example, in 1991, researchers exploring the onset of Sick Building Syndrome experienced by approximately 2700 workers conducted field tests in 41 office buildings.²⁸ The primary conclusion of that study was that “photocopying was *related* to nasal irritation, and video display terminal work [was *related*] to eye symptoms, headaches, and lethargy.”²⁹

More recent studies, conducted in laboratory settings, surpass those generalized findings and identify specific pollutant sources while quantifying the resulting emissions levels.³⁰ These contem-

24. See, e.g., UNITED NATIONS ENV'T PROGRAMME, AIR POLLUTION: WORLD'S WORST ENVIRONMENTAL HEALTH RISK (2014) available at <http://perma.cc/742A-NYKJ> (focusing on reducing global outdoor air pollution); Press Release, Int'l Agency for Research on Cancer, World Health Org., Outdoor Air Pollution a Leading Environmental Cause of Cancer Deaths (Oct. 17, 2013), available at <http://perma.cc/G99L-UWKG> (focusing on the adverse health effects from outdoor air pollution).

25. See, e.g., Christine A. Erdmann & Michael G. Apte, *Mucous Membrane and Lower Respiratory Building Related Symptoms in Relation to Indoor Carbon Dioxide Concentrations in the 100-Building BASE Dataset*, 14 INDOOR AIR 127 (2004).

26. See David Reisman, *Strict Liability and Sick Building Syndrome: Defining a Building as a Product Under Restatement (Second) of Torts, Section 402A*, 10 J. NAT. RESOURCES & ENVTL. L. 35, 35 (1995). Buildings are diagnosed as “sick” when 20 percent or more of their occupants suffer from the same symptoms, stemming from an unknown cause for at least two weeks, and those symptoms dissipate after exiting the building in question. See Steven A. Loewy et al., *Indoor Pollution in Commercial Buildings: Legal Requirements and Emerging Trends*, 11 TEMP. ENVTL. L. & TECH. J. 239, 245 (1992).

27. Loewy et al., *supra* note 26, at 239; Reisman, *supra* note 26, at 35-36.

28. Maritta S. Jaakkola & Jouni J.K. Jaakkola, *Office Equipment & Supplies: A Modern Occupational Health Concern?*, 150 AM. J. EPIDEMIOLOGY 1223, 1223 (1999).

29. *Id.* (emphasis added).

30. Even these contemporary studies suffer from experimental limitations and can be improved upon to produce more concrete results. See S.C. Lee et al., *Characterization of VOCs, Ozone, and PM₁₀ Emissions from Office Equipment in an Environmental Chamber*, 36 BUILDING & ENV'T 837, 842 (2001) (“Each of the ... pollutants associated with office equipment has the potential to cause adverse effects It is essential to investigate the root cause of emissions in order to reduce the emission, but it is rather difficult to examine all the possible factors which affect the pollutant emission from office equipment since different machines and

porary studies found that computers,³¹ photocopy machines,³² and printers³³ emit potentially dangerous volumes of VOCs.³⁴ One of the studies that quantified emission levels from personal computers even correlated exposure to the relevant VOCs with a perception of degraded air quality, negative health effects, and a decrease in work performance.³⁵

Although VOC emissions from electronic equipment are low when compared to other sources of pollutants,³⁶ such as building materials, they have a magnified impact on human health.³⁷ Such emissions lead to high VOC concentrations in poorly circulated environments, thereby creating high-risk situations.³⁸ Accordingly, people's close proximity to office equipment can result in higher personal exposures than would be estimated from pollutant concentrations in well-ventilated buildings.³⁹ Low levels of VOCs

processes give a wide range of emission levels. Even for the same machine model, the emission levels would be affected by other factors such as age, product history, maintenance cycle, air exchange rates, and product loading.”).

31. Z. Bakó-Biró et al., *Effects of Pollution from Personal Computers on Perceived Air Quality, SBS Symptoms and Productivity in Offices*, 14 *INDOOR AIR* 178, 178, 185 (2004); see also K. Hoshino et al., *Measurement of SVOCs Emitted from Building Materials and Electric Appliances Using Thermal Desorption Test Chamber Method*, in 1 *HEALTHY BUILDINGS 2003*, at 474, 476 (Tham Kwok Wai et al. eds., 2003); T. Nakagawa et al., *Chemical Emission Rates from Personal Computers*, in 1 *HEALTHY BUILDINGS 2003*, *supra*, at 468.

32. See S.K. Brown, *Assessment of Pollutant Emissions from Dry-Process Photocopiers*, 9 *INDOOR AIR* 259 (1999); Kelly Leovic et al., *Evaluation of a Test Method for Measuring Indoor Air Emissions from Dry-Process Photocopiers*, 48 *J. AIR & WASTE MGMT. ASS'N* 915, 915-16 (1998).

33. See Lee et al., *supra* note 30; T. Smola et al., *Health Hazards from Laser Printers*, 62 *AIR QUALITY CONTROL* 295 (2002).

34. See Lee et al., *supra* note 30, at 837 (“The consequence of the extensive use of modern office equipment is that office workers are exposed to an office climate giving rise to health effects such as headache; mucous irritation and dryness in the eyes, nose and throat; and dry and tight facial skin. Researchers ... reported that the operation of office equipment not only contribute to increase in indoor air pollution concentrations, but also, in some cases, has been associated with health complaints from exposed workers.”).

35. See Bakó-Biró et al., *supra* note 31, at 178.

36. Hugo Destailats et al., *Indoor Pollutants Emitted by Office Equipment: A Review of Reported Data and Information Needs*, 42 *ATMOSPHERIC ENV'T* 1371, 1371-86 (2008).

37. See Sandra J. McBride et al., *Investigations of the Proximity Effect for Pollutants in the Indoor Environment*, 9 *J. EXPOSURE ANALYSIS & ENVTL. EPIDEMIOLOGY* 602, 602 (1999).

38. *Id.*; Reisman, *supra* note 26, at 36-37.

39. Destailats et al., *supra* note 36, at 1385 (“Personal exposure to pollutants emitted from office equipment may be enhanced due to a proximity effect where users remain close to a source for an extended duration.”); see also McBride et al., *supra* note 37, at 603.

also combine with other commonly present indoor chemicals, triggering the creation of additional pollutants that result in harmful indoor environments.⁴⁰

To date, no study has examined VOC emissions from televisions, media players, or gaming devices. Similarly, no studies have measured VOC concentrations in residential buildings or quantified the impact that poor indoor air quality has on nonindustrial persons. Despite that lack of scientific patronage, previous studies suggest that those alternate electronic appliances are likely sources of VOC emissions and that high VOC concentrations in residential buildings have a negative impact on building occupants.

II. TRADITIONAL LEGISLATIVE INTENT BEHIND VOC EMISSION REGULATION

Two government agencies currently regulate VOC emissions—the Environmental Protection Agency (EPA) and the Occupational Safety & Health Administration (OSHA). This Part discusses the legislative materials authorizing those regulations and identifies their specific shortcomings in controlling VOCs. Also included in this Part is an explanation of the Toxic Substances Control Act, which does not authorize VOC regulation, but exemplifies the current limitations on environmental legislation and the federal recognition that the government must implement proactive approaches to promote healthy air quality standards.

A. *The Clean Air Act*

The EPA is required to develop national air quality standards under the Clean Air Act (CAA), the primary source of federal law regulating VOC emissions.⁴¹

40. Hugo Destailats et al., *Indoor Secondary Pollutants from Household Product Emissions in the Presence of Ozone: A Bench-Scale Chamber Study*, 40 ENVTL. SCI. TECH. 4421, 4427 (2006) (“This laboratory investigation illustrates the potential impact of ozone-initiated chemistry involving constituents of common household products and leading to the formation of secondary gaseous pollutants and particles.”).

41. Clean Air Act, 42 U.S.C. §§ 7401-7671q (2012); see JAMES E. MCCARTHY ET AL., CONG. RESEARCH SERV., 7-5700, CLEAN AIR ACT: A SUMMARY OF THE ACT AND ITS MAJOR REQUIREMENTS 5-6 (2011).

1. *National Ambient Air Quality Standards*

With the inception of the CAA in 1963, Congress recognized that the “growth ... of air pollution brought about by urbanization, industrial development, and ... use of motor vehicles, [had] resulted in mounting dangers to [] public health and welfare.”⁴² Accordingly, one of the identified purposes of the CAA was to protect public health and welfare by developing a national program to prevent and control air pollution.⁴³

As Congress passed amendments to the CAA, the national program’s requirements evolved in complexity. The 1967 CAA Amendments ordered states to create Air Quality Control Regions, adopt air quality standards for specific pollutants, and develop a state implementation plan (SIP) to achieve those air quality standards.⁴⁴ Initially, the federal government played a minor role in monitoring state air quality.⁴⁵ However, the federal government’s oversight increased exponentially with each amendment to the CAA.⁴⁶

For the purposes of this Note, the creation of the National Ambient Air Quality Standards (NAAQS) and the subsequent classifications of pollutants are the most important of these developments.⁴⁷

42. 42 U.S.C. § 7401(a)(2).

43. *See id.* § 7401(b)(1)-(2). The other identified purposes of the CAA include initiating and accelerating a national research and development program to prevent air pollution, providing technical and financial assistance to the states to aid in air pollution prevention, and encouraging the development of regional air pollution and control programs. *Id.* § 7401(b)(3)-(4).

44. Clean Air Act Amendments of 1967, Pub. L. No. 90-148, 81 Stat. 485.

45. *See* Arnold W. Reitze, Jr., *Air Quality Protection Using State Implementation Plans—Thirty-Seven Years of Increasing Complexity*, 15 VILL. ENVTL. L.J. 209, 211 (2004) (“The federal government did not set the air quality standards nor did it have much control over the development of an implementation plan.”).

46. Since the CAA’s enactment in 1963, Pub. L. No. 8-206, 77 Stat. 392 (1963), the CAA has been amended several times. The most significant changes occurred in 1970, 1977, and 1990. *History of the Clean Air Act*, U.S. ENVTL. PROTECTION AGENCY, <http://www.epa.gov/air/caa/amendments.html> [<http://perma.cc/SV8J-HKLG>] (last updated Aug. 15, 2013); *see also* Clean Air Act Amendments of 1990, Pub. L. No. 101-549, 104 Stat. 2399 (codified as amended at 42 U.S.C. §§ 7401-7671q (2012)); Clean Air Act Amendments of 1977, Pub. L. No. 95-95, 91 Stat. 685 (codified as amended at 42 U.S.C. §§ 7401-7671q (2012)); Clean Air Act Amendments of 1970, Pub. L. No. 91-604, 84 Stat. 1676 (codified as amended at 42 U.S.C. §§ 7401-7671q (2012)).

47. The Clean Air Act of 1970 established National Ambient Air Quality Standards. *History of the Clean Air Act*, *supra* note 46.

Sections 108 and 109 of the CAA outline the procedures needed to create the NAAQS.⁴⁸ First, the EPA must identify pollutants that “may reasonably be anticipated to endanger public health or welfare” and whose “presence ... in the ambient air results from numerous or diverse mobile or stationary sources.”⁴⁹ These “criteria pollutants” are then evaluated and classified as either “primary” or “secondary.”⁵⁰ The distinction between the two categories involves the intended subject, or subjects, of protection. Primary NAAQS protect public health,⁵¹ and secondary NAAQS protect, or at least prevent harm to, public welfare.⁵² When a criteria pollutant’s levels exceed those of the NAAQS in a particular region, that region is classified as a nonattainment area.⁵³ Once this happens, the region’s state must modify its SIP to reflect the actions it intends to take to lower the pollutant’s levels.⁵⁴

The EPA does not classify, and therefore does not regulate, VOCs as criteria pollutants.⁵⁵ If the EPA reclassified VOCs as criteria pollutants,⁵⁶ then any attempt to regulate VOC emissions from electronics would become moot—states would already be monitoring such activity at some level to maintain their SIPs. This change seems unlikely considering the EPA’s categorization of VOCs is guided by one factor, their potential to produce ground-level ozone.

48. 42 U.S.C. §§ 7407-7408.

49. *Id.* § 7408.

50. *Id.* § 7409(a).

51. *Id.* § 7409(b)(1).

52. *Id.* § 7409(b)(2). This section states that secondary standards “protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air.” *Id.* Later in the Act, “welfare” is defined as “effects on soils, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility, and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being.” *Id.* § 7602(h).

53. *Id.* § 7407(d)(1).

54. *Id.* § 7410.

55. *Id.* § 7409. The six criteria pollutants are sulfur dioxide, ozone, lead, particulate matter, carbon monoxide, and nitrogen dioxide. *See* National Primary and Secondary Ambient Air Quality Standards, 43 Fed. Reg. 46,246 (Oct. 5, 1978); *What Are the Six Common Air Pollutants?*, U.S. ENVTL. PROTECTION AGENCY, <http://www.epa.gov/air/urbanair/> [<http://perma.cc/UTD8-RMXF>] (last visited Apr. 3, 2015).

56. VOCs would most likely be categorized as a primary NAAQS because they pose no recognized threat to public welfare, only public health. *See supra* notes 50-52 and accompanying text.

Ground-level ozone is one of the criteria pollutants and has associated primary NAAQS.⁵⁷ Although Congress did not include the term “volatile organic compound” in the CAA until the 1990 amendments,⁵⁸ it mentioned “organic matter” as a potential threat to public health as early as 1977.⁵⁹ This is significant because the EPA has distinguished between two types of VOCs since that decade: negligibly reactive compounds, which are exempted from CAA regulation because they have minimal effects on ozone creation, and reactive compounds, which are regulated because of their propensity to form ozone.⁶⁰ The possibility that negligibly reactive compounds, or even significantly reactive compounds, could be a danger to public health before converting to ozone has not been considered.⁶¹

Section 183(e) of the CAA further required the EPA to conduct a study of VOC emissions from consumer and commercial products and determine their potential contribution to ozone formation.⁶² The results of that study were then used to establish methods of regulating the products responsible for at least 80 percent of the VOC emission levels in nonattainment areas.⁶³ Consequently, the EPA codified national standards for VOC emissions from automobile refinish coatings,⁶⁴ architectural coatings,⁶⁵ consumer products,⁶⁶ and

57. See 40 C.F.R. § 51.100(s) (2013).

58. Clean Air Act Amendments of 1990, Pub. L. No. 101-549, § 182(a)(3)(B), 104 Stat. 2399, 2427 (codified as amended in scattered sections of 42 U.S.C.).

59. Clean Air Act Amendments of 1977, Pub. L. No. 95-95, § 122(a), 91 Stat. 685, 720 (codified as amended in scattered sections of 42 U.S.C.).

60. See Interim Guidance on Control of Volatile Organic Compounds in Ozone State Implementation Plans, 70 Fed. Reg. 54,046, 54,047 (Sept. 13, 2005).

61. Many scholars attribute the adverse health effects associated with VOC exposure to ozone exposure. Compare AM. LUNG ASS'N ET AL., *supra* note 18, at 1 (discussing the health effects of prolonged exposure to VOCs), with Deborah Behles, *Examining the Air We Breathe: EPA Should Evaluate Cumulative Impacts When It Promulgates National Ambient Air Quality Standards*, 28 PACE ENVTL. L. REV. 200, 209 (2010) (linking ground level ozone exposure to “a variety of adverse health impacts, including aggravated asthma, increased bronchitis, and problems with the lower and upper respiratory systems”).

62. See 42 U.S.C. § 7511(b)(e)(2)(A) (2012).

63. *Id.* § 7511(b)(e)(3)(A).

64. National Volatile Organic Compound Emission Standards for Automobile Refinish Coatings, 63 Fed. Reg. 48,806 (Sept. 11, 1998) (to be codified at 40 C.F.R. pts. 9, 59).

65. National Volatile Organic Compound Emission Standards for Architectural Coatings, 63 Fed. Reg. 48,848 (Sept. 11, 1998) (to be codified at 40 C.F.R. pt. 59).

66. National Volatile Organic Compound Emission Standards for Consumer Products, 63 Fed. Reg. 48,819 (Sept. 11, 1998) (to be codified at 40 C.F.R. pts. 9, 59).

aerosol coatings.⁶⁷ After sufficiently reducing the initial 80 percent of VOC emissions, the sources responsible for the remaining 20 percent of emissions would become more important and worthy of regulation. Emissions resulting from electronic and indoor appliances could potentially be included in that 20 percent, but there is no way of knowing when those regulations would be deemed necessary under the current CAA provisions. Because there is no way of knowing when that reduction might happen, this would be an ineffective means of regulating VOC emissions from electronic appliances.

2. Regulating Hazardous Air Pollutants

Separate from the development and enforcement of NAAQS are the regulations promulgated to further section 112 of the CAA, the final section authorizing EPA regulation of VOC emissions. Specifically, that section calls for the legal control of hazardous air pollutants (HAPs).⁶⁸ Before enacting the 1990 CAA Amendments, the EPA defined a HAP as “an air pollutant to which no ambient air quality standard is applicable and which ... causes, or contributes to, air pollution which may reasonably be anticipated to result in an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness.”⁶⁹ Similar to the development of the NAAQS, HAP regulation has evolved in complexity and comprehensiveness over the years.⁷⁰

According to the EPA, individuals exposed to HAPs have an increased risk of experiencing “neurological, reproductive, ... developmental, respiratory, and other health problems.”⁷¹ Easily recognizable dangerous substances, such as arsenic, cyanide, and mercury, are included in the 150 compounds currently classified as

67. National Volatile Organic Compound Emission Standards for Aerosol Coatings, 73 Fed. Reg. 66,184 (Nov. 7, 2008) (to be codified at 40 C.F.R. pt. 59).

68. 42 U.S.C. § 7412.

69. *Id.* § 7412(a)(1) (1988). Currently, a HAP is defined as “any air pollutant listed pursuant to subsection (b) of this section.” § 7412(a)(6) (2012).

70. For a thorough history of HAP regulation, see Arnold W. Reitze, Jr. & Randy Lowell, *Control of Hazardous Air Pollution*, 28 B.C. ENVTL. AFF. L. REV. 229 (2001).

71. *What Are the Health and Environmental Effects of Toxic Air Pollutants?*, U.S. ENVTL. PROTECTION AGENCY, <http://www.epa.gov/ttn/atw/allabout.html> [<http://perma.cc/JGD2-3E6T>] (last visited Apr. 3, 2015).

HAPs.⁷² But that list also includes obscure substances that are also VOCs, including glycol ethers, methyl chloride, and benzene.⁷³ SIPs regulate some of these VOCs, which inadvertently promotes NAAQs.⁷⁴ It is worth noting that little is known regarding the effect that HAPs, including the listed VOCs, have on human health outside of carcinogenic properties.⁷⁵ Considering that studies have linked VOCs to a multitude of conditions and symptoms other than cancer, this limited knowledge base seems counterintuitive.⁷⁶

In addition to HAP classifications, section 112 requires the EPA to develop a list of categories of major sources and area sources emitting one or more of the identified hazardous compounds.⁷⁷ “Major sources” are groups of stationary sources in neighboring areas under common control that emit a certain volume of HAPs each year.⁷⁸ In contrast, “area sources” are stationary sources that do not emit significant volumes of HAPs.⁷⁹ A “stationary source” is any “building, structure, facility, or installation” that “emits, or may emit, any air pollutant.”⁸⁰ Because both classifications are characterized by their contribution of emissions into ambient air, neither addresses VOC emissions that may create a hazardous indoor environment when allowed to accumulate.

Although an initial reading of section 112’s purpose demonstrates Congress’s intent to monitor all dangerous air pollutants,⁸¹

72. See 42 U.S.C. § 7412(b)(1).

73. *Id.*

74. See, e.g., Reitze, *supra* note 45, at 343 (“[S]tandards for hazardous air pollutants (HAPs) promulgated pursuant to section 112 also will reduce interstate transport of VOCs because most organic HAPs are VOCs.”) (footnote omitted).

75. See, e.g., Reitze & Lowell, *supra* note 70, at 236 (“Very little is known about health problems, other than cancer, caused by air pollutants, because most testing has been for carcinogenic properties.”).

76. See *supra* Part I.B.

77. 42 U.S.C. § 7412(a)(1)-(2).

78. *Id.* § 7412(a)(1) (“[A]ny stationary source or group of stationary sources located within a contiguous area and under common control that emits ... in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants.”).

79. *Id.* § 7412(a)(2).

80. *Id.* § 7411(a)(3).

81. See *id.* § 7412(b)(2) (“[A]dding pollutants which present, or may present, through inhalation or other routes of exposure, a threat of adverse human health effects (including, but not limited to, substances which are known to be, or may reasonably be anticipated to be, carcinogenic, mutagenic, teratogenic, neurotoxic, which cause reproductive dysfunction, or

the EPA has only used it to monitor industrial sources.⁸² The EPA focuses on contributions to the ambient air stemming from stationary industrial sources, such as chemical plants and factories, and mobile sources, such as automobiles.⁸³ Outside of industrial settings, the EPA does not regulate indoor air.⁸⁴ It is clear that under the current parameters of the CAA, the EPA cannot monitor indoor VOC emissions from electronics. A separate federal agency, OSHA, is generally responsible for indoor air quality standards.

B. The Occupational Safety and Health Act

The United States Department of Labor, through the Occupational Safety and Health (OSH) Act, also monitors VOC levels.⁸⁵ The OSH Act authorized the creation of the Occupational Safety & Health Administration (OSHA), an agency whose purpose is to “assure so far as possible every working man and woman in the nation safe and healthful working conditions.”⁸⁶ OSHA does this by promulgating health standards that create “conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment and places of employment.”⁸⁷

As such, the legislative intent behind OSHA included the authority to regulate indoor air quality at the work place.⁸⁸ Encompassed

which are acutely or chronically toxic) or adverse environmental effects whether through ambient concentrations, bioaccumulation, deposition, or otherwise.”).

82. See *An Introduction to Indoor Air Quality*, *supra* note 6.

83. See Arnold W. Reitze, Jr. & Sheryl-Lynn Carof, *The Legal Control of Indoor Air Pollution*, 25 B.C. ENVTL. AFF. L. REV. 247, 247 (1998).

84. *Regulatory Information by Topic*, U.S. ENVTL. PROTECTION AGENCY <http://www2.epa.gov/regulatory-information-topic/air#indoorair.com> [<http://perma.cc/L37A-GLDN>] (last visited Apr. 3, 2015) (“EPA does not regulate indoor air, but we do offer assistance in protecting your indoor air quality.”).

85. See William Cary Wright, *Indoor Air Quality Claims: Defining the Practical and Legal Issues*, 14 NAT. RESOURCES & ENV'T 255, 256 (2000).

86. Occupational Safety and Health Act of 1970, Pub. L. No. 91-596, 84 Stat. 1590 (1970) (codified as amended at 29 U.S.C. §§ 651-678 (2012)).

87. 29 U.S.C. § 652 (2012).

88. See Stanley A. Millan, *Green Buildings and Plugging the Gaps in Environmental Laws*, 27 TUL. ENVTL. L.J. 43, 52 (2013) (“[OSHA] has authority to regulate indoor air in the work place, but it has limited itself mostly to general duty standards and has specific standards only for a relatively moderate list of industrial chemicals.”).

under that authority to promote a safe work place is the regulation of “toxic materials or harmful physical agents.”⁸⁹ Although this authority seems broad, it has been significantly tailored. Currently, to qualify as a harmful agent, the Secretary of Labor must find that a compound poses a “significant risk” at “existing exposure levels in the workplace.”⁹⁰ OSHA is thereby limited to setting general duty standards for industrial chemicals.⁹¹ Consequently, even if OSHA monitored VOC emissions from electronics, their supervision would not extend to nonindustrial settings.

In 1994, OSHA administrators attempted to overcome that strict regulatory purview by proposing a set of parameters that would “apply to all indoor ‘nonindustrial work environments.’”⁹² In that proposal, OSHA acknowledged that “[a]ppiances, office equipment, and supplies can emit VOCs” and identified a list of products that contributed to Sick Building Syndrome, as well as other indoor environmental illnesses.⁹³ Although that proposal identified specific VOCs associated with the presence of office appliances, the majority of that research relied on generalized scientific findings, not definite VOC emission levels quantified in laboratory settings.⁹⁴ Regardless, in 2001, OSHA withdrew the portions of the 1994 proposal related to VOCs and Sick Building Syndrome, explaining that these provisions had “received little attention during the rulemaking proceedings.”⁹⁵ Consequently, OSHA does not regulate indoor VOC emissions from electronics in industrial or nonindustrial settings.

89. 29 U.S.C. § 655(b)(5).

90. *AFL-CIO v. OSHA*, 965 F.2d 962, 980 (11th Cir. 1992).

91. Today, that list includes over 300 compounds, some of which are VOCs. *See* 29 C.F.R. § 1910.1000 (2013).

92. *Indoor Air Quality*, 59 Fed. Reg. 15,968, 15,968 (proposed Apr. 5, 1994) (to be codified at 29 C.F.R. pts. 1910, 1915, 1926, 1928).

93. *Id.* at 15,984 (listing appliances, computer/video display terminals, electrophotographic printers, and photocopiers as sources of VOCs).

94. *See* discussion *supra* Part I.B.

95. *Indoor Air Quality*, 66 Fed. Reg. 64,946, 64,946 (Dec. 17, 2001) (to be codified at 29 C.F.R. pts. 1910, 1915, 1926, 1928). In the withdrawal, OSHA specifically stated, “This document does not preclude any agency action that OSHA may find to be appropriate in the future.” *Id.* The sections of the proposal that received an enthusiastic response related to environmental tobacco smoke. *Id.*

C. *The Toxic Substances Control Act*

The federal government could regulate VOCs through the Toxic Substances Control Act (TSCA), but currently does not.⁹⁶ The TSCA gives the EPA authority to regulate chemical compounds that “present an unreasonable risk of injury to [human] health or the environment.”⁹⁷ Provisions of the TSCA further allocate power to the EPA to do the following: (1) take legal action against manufacturers, processors, and distributors of “imminently hazardous chemical substances;”⁹⁸ (2) require the same parties to develop data on potential effects any chemical compound has on human health or the environment;⁹⁹ and (3) directly regulate any substance that presents an unreasonable risk to the same.¹⁰⁰ Authorized sanctions range from requiring the responsible party to place a warning label on their product, to completely prohibiting a substance’s use.¹⁰¹

Although the potential impact the TSCA could have on indoor air quality is great, various court decisions and interpretations limit its application. Thirty-eight years after its adoption, the EPA has only restricted the use of five chemicals out of almost 80,000 identified chemicals.¹⁰² The EPA’s 1989 attempt to ban asbestos is the most visible example highlighting the TSCA’s failure to regulate chemicals.¹⁰³ In *Corrosion Proof Fittings v. Environmental Protection Agency*, a manufacturing company that used asbestos in its products successfully challenged the EPA’s ban on asbestos.¹⁰⁴ The Fifth Circuit ruled against the ban because the EPA had difficulty demonstrating that asbestos represented an “unreasonable risk” to human

96. 15 U.S.C. §§ 2601-2697 (2012).

97. *Id.* § 2605(b)(2)(B).

98. *Id.* § 2606(a).

99. *Id.* § 2603(a)(1)(A)(i).

100. *Id.* § 2606(b)(1).

101. *Id.* § 2605(a)(1)-(3).

102. Lisa P. Jackson, Adm’r, U.S. Env’tl. Protection Agency, Remarks to the Commonwealth Club of San Francisco (Sept. 29, 2009), available at <http://perma.cc/PJ54-D94H> (“Since 1976, EPA has issued regulations to control only five existing chemicals determined to present an unreasonable risk. Five from a total universe of almost 80,000 existing chemicals.”).

103. See, e.g., Jessica N. Schifano et al., *The Importance of Implementation in Rethinking Chemicals Management Policies: The Toxic Substances Control Act*, 41 ENVTL. L. REP. (ENVTL. L. INST.) 10,527, 10,533 (2011).

104. 947 F.2d 1201, 1228 (5th Cir. 1991).

health and had not considered employing less burdensome alternatives.¹⁰⁵

Those restrictions directly oppose at least one of the major motivators behind Congress's decision to adopt the TSCA: implementing a proactive approach for dealing with the health problems associated with toxic materials.¹⁰⁶ As per the courts, the definition of "unreasonable" accorded to the TSCA suggests that it either borders, or is synonymous with, imminently hazardous. This interpretation ignores the concept that the TSCA has a separate section designated for such substances.¹⁰⁷ If the judiciary had adopted a broader interpretation of the TSCA's application—for example, one that recognized the decision to implement the phrases "unreasonable risk" and "imminently dangerous" in separate sections—then the EPA might have utilized the TSCA to prohibit the manufacture of chemicals identified as significant VOC emission sources. Because even the recognized dangers of asbestos and lead failed to meet the current necessary level of risk,¹⁰⁸ such an attempt would be foregone and fruitless. This constraint appears puzzling when considering a statement made by Senator James Pearson, one of the TSCA's sponsors: "We can no longer operate under the assumption that what we do not know about a chemical substance cannot hurt us. Tragic results associated with too many toxic substances have taught us that lesson all too well."¹⁰⁹ As such, although the TSCA does not regulate VOCs, the reasoning behind its adoption demonstrates a need for a proactive approach to environmental regulation, particularly to protect public health.

105. *Id.* at 1229. Since the failed asbestos ban, the EPA has made two subsequent attempts to restrict chemical use through the TSCA: prohibitions on the use of acrylamide as well as N-methylacetaldehyde in grout, and lead in fishing sinkers. Neither was finalized. Schifano et al., *supra* note 103, at 10,533.

106. Toxic Substances Control Act, Pub. L. No. 94-469, 90 Stat. 2003 (codified as 15 U.S.C. §§ 2601-2603 (2012)), *reprinted in* LEGISLATIVE HISTORY OF THE TOXIC SUBSTANCES ACT 760, 783 (1976) [hereinafter LEGISLATIVE HISTORY OF THE TOXIC SUBSTANCES ACT] ("[Existing environmental legislation] generally deal[t] with a problem only *after* it [] manifest[ed]" and the government "should no longer be limited to repairing [] damage after it has been done."). For a more detailed elaboration of the legislative shortcomings addressed by the TSCA and its drafters, see David Markell, *An Overview of TSCA, Its History and Key Underlying Assumptions, and Its Place in Environmental Regulation*, 32 WASH. U. J.L. & POL'Y 333, 344 (2010).

107. See 15 U.S.C. § 2606(a)(B) (2012).

108. See Schifano et al., *supra* note 103, at 10,533.

109. LEGISLATIVE HISTORY OF THE TOXIC SUBSTANCES ACT, *supra* note 106, at 215.

D. Summarizing the Inadequacies of Current Regulations

Of the two federal agencies that may regulate VOC emissions, the EPA has the most power to do so. Unfortunately, the crux of that power, preventing the creation of ground-level ozone, also forms the basis of the primary limitation on the possibility of EPA regulated indoor VOC emissions. If under the CAA, the EPA reclassified VOCs as a class of criteria pollutants, monitored VOCs more than ambient air, or considered the harm pollutants may cause in high indoor concentrations, then there would be less of a need for new VOC regulations. OSHA's inability to regulate indoor VOC emissions is similarly neutered by both statutory interpretation and a restricted reach—one that only extends to general standards in industrial settings.

This gap in regulatory authority—the inability of any federal agency to promulgate environmental standards to protect the American's health—can therefore only be filled by new statutory language. As Congress acknowledged when it passed the TSCA, any new statutory language providing authority over air quality must take a proactive approach to protect public health, rather than wait for an irreparable situation to present itself.¹¹⁰

III. NEW HORIZONS FOR THE CLEAN AIR ACT

The following Part explains which agency is best suited to handle the newfound responsibility of indoor VOC regulation, outlines the best example of new statutory language, and explains the suggested amendment and its significance.

A. Expanding the EPA's Power

Although the EPA does not currently regulate indoor air quality, it is the agency best suited for the newfound responsibility. OSHA's 1994 proposal attempted, but failed, to give OSHA the authority necessary to promulgate indoor air quality regulations for nonindus-

110. See *supra* Part II.C.

trial settings.¹¹¹ That lackluster reaction could be explained by a number of factors, including the generality of the scientific research used in its drafting,¹¹² a general skepticism toward Sick Building Syndrome,¹¹³ or even that the positive public outcry surrounding the proposal's other half—environmental tobacco smoke—overshadowed a less recognized public health risk.¹¹⁴ Regardless of the actual rationalization, it would be repetitive to make a substantially similar proposal, even if the corresponding science is now more definitive in nature.¹¹⁵

A more persuasive route to regulation would be an attempt to expand the EPA's power. Unlike OSHA, the EPA already has some control over VOC emissions from consumer products, demonstrating Congress's willingness to grant the EPA discretion in regards to public health and policy. Additionally, an amendment to the CAA specifically worded to broaden the EPA's reach to nonambient, indoor air would dissolve many of the EPA's current shortcomings. As such, an amendment to the CAA providing the basis for the regulation of VOC emissions from electronics would stand the best chance of congressional approval.

B. The Cumulatively Dangerous Air Pollutant Amendment

1. Proposed Amendment

If passed, the following amendment to the CAA, titled the "Cumulatively Dangerous Air Pollutant Amendment," would broaden the purview of the EPA, granting it the authority to promulgate regulations concerning the effect that VOCs, as well as other cumulatively dangerous air pollutants, have on indoor air quality, and more importantly, public health:

(A) Definitions

For purposes of this section—

111. See *Indoor Air Quality*, 59 Fed. Reg. 15,968, 15,968 (proposed Apr. 5, 1994) (to be codified at 29 C.F.R. pts. 1910, 1915, 1926, 1928).

112. See *supra* Part I.B.

113. See *infra* Part V.A.2.

114. See *supra* note 95 and accompanying text.

115. See discussion *supra* Part I.B.

(1) **Electronic appliance:** The term “electronic appliance” means any electrical device listed under subsection (C) of this section and any other device the Administrator determines to be a contributor to the concentration of cumulatively dangerous air pollutants.

(2) **Adverse environmental effect:** The term “adverse environmental effect” for this subsection is identical to that of § 7412 of this Act.¹¹⁶

(3) **Cumulatively dangerous air pollutant:** The term “cumulatively dangerous air pollutant” means an air pollutant that in the judgment of the Administrator causes, or contributes to, air pollution that may reasonably be anticipated to result in an increase in ozone or other compound that that has an adverse environmental effect, or that is detrimental to human health when found in concentrations higher than those anticipated in healthy surroundings.

(B) **Risk and safety assessment**

(1) For the purpose of establishing a compound as cumulatively dangerous, the Administrator shall, within a reasonable period of time, publish, and from time to time revise a list, which includes pollutants—

(a) whose presence, after escaping into the ambient air, contributes to air pollution that may reasonably be anticipated to endanger public health or public welfare; and

(b) whose emissions, in the Administrator’s judgment, cause or contribute to air pollution that may reasonably be anticipated to endanger public health in above-normal indoor concentrations.

The list described under paragraph (1) shall also include electronic appliances that, in the Administrator’s judgment, are responsible for the emissions of the applicable cumulatively dangerous air pollutant or pollutants.

(2) If the Administrator finds that—

(a) there is insufficient data to properly determine whether consumer use of an electronic appliance has

116. “The term ‘adverse environmental effect’ means any significant and widespread adverse effect, which may reasonably be anticipated, to wildlife, aquatic life, or other natural resources, including adverse impacts on populations of endangered or threatened species or significant degradation of environmental quality over broad areas.” 42 U.S.C. § 7412(a)(7) (2012).

a detrimental effect as described in section (B)(1); and that

(b) additional monitoring and testing is required to make such determinations;

The Administrator shall by rule require that testing be conducted with the relevant electronic appliance and that the manufacturer develop the appropriate emissions data.

(C) Testing and data collection requirements

(1) If the Administrator makes a determination under paragraph (B)(2), the Administrator shall by rule require that testing be conducted on such electronic appliance or its component parts to develop data with respect to the health and environmental effects for which there is an insufficiency of data and experience and which are relevant to the determination that use of such appliances does or does not present a risk of an adverse environmental effect or injury to health.

(2) In determining the standards to be met under this section, the Administrator shall consider the relative costs of the various test protocols and methodologies that may be required under the rule.

(3) The following persons shall be required to conduct tests and submit data in accordance with this section—

(a) each person who manufactures, intends to manufacture, distributes, or intends to distribute the corresponding electronic appliance, or

(b) each person who manufactures, or intends to manufacture component parts of electronic appliances.

(4) If additional data is developed as provided by subsection (C)(3)(b), then the standards enumerated in subsection (C)(2) must be met for each component part in an electronic appliance's construction unless otherwise exempted by the Administrator under this Act.

(D) Sanctions

(1) If the Administrator makes a determination under paragraph (B)(1), the Administrator shall, by consent agreement or order, as appropriate—

(a) prohibit manufacture of the appliance, or prohibit manufacture without compliance with restrictions specified in the relevant order; or

(b) issue a suspension of future production of that appliance, for a reasonable time, to notify and give the affected manufacturer an opportunity to lower the relevant cumulatively dangerous air pollutant emissions; or

(c) require that the appliance be marked with, or accompanied by, clear and adequate warnings and instructions with respect to proper and safe use, the form and content of this material will be prescribed and approved by the Administrator.

(E) Appeals and applications for exemption to the Administrator

(1) A manufacturer, or similar party, may appeal the Administrator's classification within twelve (12) months after he has been notified of the results of the Administrator's safety assessment and accompanying sanctions. Such an appeal is only appropriate if the appealing party has reason to believe that the manufactured appliance does not emit the identified cumulatively dangerous air pollutant or that the imposed sanction is not economically or technologically reasonable.

(2) Any person required by rule under this Act to conduct tests and submit data on an electronic appliance or its component parts may apply to the Administrator (in such form and manner as the Administrator shall prescribe) for an exemption from such requirement.

(a) An exemption should be granted if, upon receipt of an application under paragraph (2), the Administrator finds that—

(i) the electronic appliance or component part with respect to which such application was submitted is equivalent to an electronic appliance or component part for which data has previously been submitted to the Administrator in accordance with this Act, and

(ii) submission of data by the applicant for such electronic appliance or component part would be duplicative of the previously submitted data.

(b) If the exemption under paragraph (2) is granted on the basis of the existence of previously submitted tests and data and such exemption is granted during the reimbursement period (to be determined by the Administrator), then unless such applicant and the

parties responsible for the submission of the data described in paragraph (2)(a)(i) reach a private understanding, the Administrator shall order the person granted the exemption to provide fair and equitable reimbursement, in an amount determined under rules of the Administrator, to the party whose data provided the basis for the exemption.

2. *Commentary on the Proposed Amendment*

Following the structure of the CAA, section A of this proposed Amendment gives the definitions of relevant key phrases, including two that are not currently codified.¹¹⁷ The first of those phrases, “electronic appliance,” has a considerably broader definition than similar labels found within the Act.¹¹⁸ This latitude permits the EPA to regulate any electronic device, including those in nonindustrial and industrial settings. The second phrase, “cumulatively dangerous air pollutant,” has a similarly expansive definition to address both the negative effect compounds have on ambient air,¹¹⁹ as well as indoor air quality. The breadth of those definitions is significant because the language provides the EPA with the necessary legislative framework to regulate more than the traditionally protected ambient air, signaling a transition into currently nonregulated indoor environments. As emphasized above, there is a substantial need to begin monitoring indoor air quality because of the overwhelming amount of time Americans now spend surrounded by four walls.¹²⁰

Statutes themselves rarely set out specific criteria used to determine proper scientific procedures or safe pollutant exposure levels.¹²¹ Instead, they provide general time requirements and

117. “Adverse environmental effect” is afforded the same definition applicable under 42 U.S.C. § 7412.

118. *See, e.g., id.* § 7412(a)(8) (defining “electric utility steam generating unit” as “any fossil fuel fired combustion unit of more than 25 megawatts that serves a generator that produces electricity for sale.”).

119. *See supra* Part II.A.1.

120. *See supra* Part I.

121. *See* 42 U.S.C. § 7412(e)(1) (“In general: The Administrator shall promulgate regulations establishing emission standards for categories and subcategories of sources initially listed for regulation ... as expeditiously as practicable.”); *id.* § 7619(b)(2)(A) (“Proposed regulations: Not later than March 1, 2006, after consultation with Federal land managers and

procedural overviews, leaving the precise logistics of risk and safety assessments to the party most capable of identifying them—the agency that will promulgate the resulting regulations.¹²² As such, section B(1), modeled largely after section 7511 of the CAA,¹²³ follows that precedent by giving the Administrator of the EPA the authority to decide the parameters for the risk and safety assessment.

The phrase “may reasonably be anticipated” is also embedded in section B(1). Seemingly immaterial, this language is important because one of the many restrictions on regulations safeguarding public health is that the regulatory agency must show that a significant or imminent risk is present to justify the imposed regulation.¹²⁴ Yet, such standards are counterproductive to encouraging a proactive approach to handling any situation. Lowering that standard makes the *prima facie* showing for classification of a cumulatively dangerous air pollutant less burdensome, and implementing the necessary proactive approach becomes considerably less difficult.

That subsection further allows the EPA to develop a list of cumulatively dangerous air pollutants, as well as the electronic appliances responsible for their emissions. If the EPA Administrator lacks adequate knowledge to include an electronic appliance on said list, section B(2) permits the promulgation of rules that require manufacturer testing to aid in that determination. Once again, this agency action mirrors the authority granted to the EPA by the TSCA.¹²⁵ The guidelines for these tests, reflecting the tradition of providing general authority and procedural overviews, are given in section C.¹²⁶ In addition to that broad language, section C also provides that private parties may opt to test specific component parts of an electronic appliance—rather than the appliance itself. This avenue is provided so that manufacturers may choose to identify materials that are exempt from the Amendment and proceed to

State air pollution control agencies, the Administrator shall publish in the Federal Register proposed regulations governing the review and handling of air quality monitoring data influenced by exceptional events.”).

122. See sources cited *supra* note 121.

123. See 42 U.S.C. § 7511.

124. See discussion *infra* Part V.B.1.

125. 15 U.S.C. § 2603(a) (2012).

126. *Id.* § 2603(b)(3).

take advantage of the exemption process described in the Amendment's final section.

Section D lists the types of sanctions the EPA may impose upon manufacturers of appliances. They are nearly identical to those found in the TSCA,¹²⁷ and are therefore presumably within the realm of accepted regulatory action. Particularly imperative is the imposition of clear and adequate warning labels and safe-use instructions. All of the negative health effects associated with VOC exposure result from prolonged contact with high concentrations of the compounds.¹²⁸ Warnings and instructions explaining safe procedures for use—even simple suggestions such as adequate room ventilation—would have a substantial impact on the prevalence of the identified health effects. In contrast, the threat of a complete ban on manufacturing was not included in the amendment because of a high likelihood of effectiveness. Rather, it was included to reinforce the impression of fairness when the EPA employs one of the other authorized sanctions.

The last sanction, an order suspending future production, serves the same purpose as the appeals process described in section E—creating an incentive or opportunity to force manufacturers to contemplate the potential harm their products may cause to the public. The suspension of future production does this by notifying the manufacturer that in a reasonable amount of time it must stop production of the identified product unless it has improved the level of cumulatively dangerous air pollutants the product emits during normal use. That order is intended to force the manufacturer to engage in research and development, including conducting its own analysis as to what component parts are the source of the air quality problem. Similarly, during the appeals process, the manufacturer must conduct its own investigation to successfully challenge the disputed sanction. Both courses of action serve the same purpose, establishing a proactive approach to monitoring indoor air quality to the benefit of public health.

Section E also provides an opportunity for manufacturers to apply for an exemption from the Amendment's data collection requirements while promoting cost effective research and business

127. *See id.* § 2605(a)-(c).

128. *See supra* Part I.

practices. Akin to the exemption detailed in the TSCA, section E provides manufacturers with several important opportunities. First, it allows the manufacturers of new or untested electronic appliances to bypass any lengthy testing periods by taking advantage of preexisting research. Second, it allows manufacturers who have complied with the Administrator's rules to regain a portion of their expenditures. Lastly, it promotes manufacturer use of preapproved, consumer-friendly component parts. Section E does this by incentivizing the development of a preapproved materials list that manufacturers may use to create future electronic appliances—thereby entirely avoiding regulation of cumulatively dangerous air pollutants.

IV. INDOOR AIR QUALITY REGULATION WOULD BENEFIT PUBLIC HEALTH WHILE ENCOURAGING INDUSTRIAL INNOVATION

If passed, the Cumulatively Dangerous Air Pollutant Amendment would positively affect public health and productivity, motivate industrial actors to develop safer technologies, and substantiate current state and private interest attempts to improve indoor environments.

A. A Healthier, More Industrious Population

By reducing the concentrations of VOCs and other cumulatively dangerous air pollutants found in indoor environments, the EPA would promote the health of citizens and improve productivity. In OSHA's 1994 proposal to regulate air quality in nonindustrial work environments, the Agency examined the medical and economic impact that negative indoor air quality had on the nonindustrial American workforce.¹²⁹ As part of that examination, OSHA investigated the frequency that the pertinent employee populations suffered from respiratory complications and debilitating headaches.¹³⁰ It found that 85 out of every 1000 employees developed severe upper respiratory symptoms that required medical attention

129. Indoor Air Quality, 59 Fed. Reg. 15,968 (proposed Apr. 5, 1994) (to be codified at 29 C.F.R. pts. 1910, 1915, 1926, 1928).

130. *Id.*

and that 57 out of every 1000 employees suffered from severe headaches that either required the same or that resulted in restricted daily activity levels.¹³¹ Furthermore, the proposal explained that if OSHA could mitigate those adverse health effects, increases in employee productivity and customer satisfaction would result in as much as a \$15 billion increase in profits for the affected industries.¹³²

As previously mentioned, the dangers of overexposure to VOCs include more than just respiratory complications and headaches.¹³³ Even though no studies have quantified the economic benefit that would result from a decrease in the many symptoms that result from VOC exposure, it seems reasonable to assume that a reduction in VOC-associated symptoms would result in an equal, if not greater, economic benefit to industries. For example, a study conducted in 1997 estimated the potential profit margin for American industry that would result from generally improved indoor air quality.¹³⁴ The researchers responsible for that study assessed potential values for decreases in respiratory disease, reduced asthma risk, reduced Sick Building Syndrome symptoms, and benefits from direct improvements in performance unrelated to worker health, and ultimately projected a potential annual savings and productivity gain of \$28 to \$168 billion for American industries.¹³⁵

Although neither study directly comments on the impact that high concentrations of VOCs have on productivity, they are demonstrative of the potential monetary gain industries may experience after transitioning to a healthy indoor environment. This argument is especially persuasive when comparing the scope of the two projections—application to nonindustrial work environments and application to all industrial environments¹³⁶—to the scope of the Cumulatively Dangerous Air Pollutant Amendment—application to all indoor environments.¹³⁷ Regulation of all indoor environments

131. *Id.* at 15,997.

132. *Id.* at 16,012.

133. *See supra* Part I.

134. William J. Fisk & Arthur H. Rosenfeld, *Estimates of Improved Productivity and Health from Better Indoor Environments*, 7 *INDOOR AIR* 158, 158, 168-69 (1997).

135. *Id.* at 169.

136. Indoor Air Quality, 59 Fed. Reg. at 15,968-69 (“The provisions of the standard are proposed to apply to all indoor ‘nonindustrial work environments.’”).

137. *See supra* Part III.B.

would most likely prove to be more beneficial than OSHA's projection and, potentially, fall within or supersede the spectrum offered in the 1997 study.

B. Encouraging Innovation and Efficiency

At its core, the amendment proposed in this Note illustrates the most direct and common form of environmental law—prescriptive regulation.¹³⁸ Prescriptive regulations tell actors what is and is not permissible in certain contexts.¹³⁹ For example, Congress required states to regulate air pollution according to federal specifications through the CAA, thereby telling states what level of ambient air pollution was, and was not, permissible.¹⁴⁰ Yet, the efficiency of prescriptive regulations is debatable.¹⁴¹ Some experts believe that they stifle innovation by disincentivizing progress—once an actor achieves the bare minimum of compliance, there is no motivation to go any further in regards to research, development, or control.¹⁴² The optimistic view of prescriptive regulation argues that strict prescriptive regulation has the potential to encourage production process and design innovation, resulting in an increase in efficiency and productivity.¹⁴³ Because portions of the Cumulatively Dangerous Air Pollutant Amendment, specifically the temporary suspension and appeals process, are designed to force manufacturer research, the Amendment encourages the development and use of materials that emit lower levels of pollutants as component parts for

138. See James Salzman, *Teaching Policy Instrument Choice in Environmental Law: The Five P's*, 23 DUKE ENVTL. L. & POL'Y F. 363, 364-65 (2013).

139. *Id.*

140. See *supra* Part II.A.

141. See Molly J. Walker Wilson, *A Behavioral Critique of Command-and-Control Environmental Regulation*, 16 FORDHAM ENVTL. L. REV. 223 (2005) (criticizing the ineffectiveness of over forty years of prescriptive environmental regulations); see also William F. Pedersen, Jr., *Why the Clean Air Act Works Badly*, 129 U. PA. L. REV. 1059 (1981).

142. See, e.g., Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333 (1985) (arguing for a more nuanced regulatory system); Howard Latin, *Ideal Versus Real Regulatory Efficiency: Implementation of Uniform Standards and "Fine-Tuning" Regulatory Reforms*, 37 STAN. L. REV. 1267, 1331 (1985) (arguing that although flawed, prescriptive environmental regulation is the most effective); Cass R. Sunstein, *Paradoxes of the Regulatory State*, 57 U. CHI. L. REV. 407, 420-21 (1990) (arguing that "promoting good control technology" discourages progress).

143. Salzman, *supra* note 138, at 365-66.

electronics and other appliances in the future, exemplifying the second view of prescriptive regulation.

As mentioned earlier in this Note, Congress has already adopted the position that the government must abandon its antiquated approach of dealing with environmental problems only after they emerge in force.¹⁴⁴ Despite that decades-old call to action over forty years ago, environmental regulations have remained unchanged—legislation is still primarily drafted in response to whichever pollution source or climate change is prevalent in the media.¹⁴⁵ If adopted, the Cumulatively Dangerous Air Pollutant Amendment would mark an end to that era, as it would signify a renewed attempt to prevent air pollution, not simply a mad scramble to stabilize an undesirable situation.

C. Substantiating State and Private Interest Attempts

The Amendment would substantiate state and private interest attempts to regulate indoor air quality and VOCs. Thirty-eight states and the District of Columbia have guidelines regulating indoor air quality standards.¹⁴⁶ The scope of those regulations range from investigating illnesses and outbreaks whose suspected cause is poor indoor air quality to establishing an advisory council responsible for developing statewide indoor air quality standards.¹⁴⁷ Many of the state statutes are specifically geared toward indoor air quality in schools,¹⁴⁸ perhaps because youths are seen as particularly vulnerable to environmental pollutants.¹⁴⁹ If passed, this Note's proposed amendment would further the interests of those statutes by preventing air pollutant emissions from appliances. Prohibition of those appliances, or a reduction in VOC emissions, would also aid

144. See *supra* Part II.C.

145. See Markell, *supra* note 106, at 346.

146. A March 2015 Westlaw search for indoor air quality regulations showed thirty-eight states and the District of Columbia have guidelines in place.

147. See HAW. REV. STAT. § 321-413 (West 2013); 410 ILL. COMP. STAT. 87/15 (2014); TEX. GOV'T CODE ANN. § 2165.304 (West 2013); WASH. REV. CODE § 70.162.020 (West 2013).

148. See, e.g., TENN. CODE ANN. § 49-2-121 (West 2013); WASH. REV. CODE ANN. § 70.162.050 (West 2013); W. VA. CODE ANN. § 18-9E-5 (West 2013).

149. See William W. Nazaroff, *Exploring the Consequences of Climate Change for Indoor Air Quality*, ENVTL. RES. LETTER, Jan.-Mar. 2013, at 1, 4 ("Subpopulations that are potentially vulnerable to climate-changed-induced impacts on indoor environmental quality include ... [the] young, [or] old.").

in the private certification of environmentally sustainable “green” buildings.¹⁵⁰ A number of organizations have issued guides for green building and emphasized the impact that indoor air quality can have on human health.¹⁵¹ Some, including the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED), require that the products used by the construction industry, and even the furnishings of completed buildings, consist of components that emit low levels of VOCs.¹⁵² The proposed statutory amendment would substantially increase the number of industries affected by VOC regulation, as well as the corresponding financial burden.

V. INDUSTRIAL OPPOSITION AND CHALLENGES TO THE PROPOSED AMENDMENT

As the purpose of the Cumulatively Dangerous Air Pollutant Amendment is to provide the EPA with the authority to promulgate regulations on VOC emissions from electronics, it faces two sets of obstacles. The first and most immediate set consists of those present during Congress’s deliberations. The second set, looking to the future, would be present after the EPA promulgated and implemented the corresponding regulations. The following section addresses examples of both sets of obstacles.

A. Obstacles to Passing the Amendment

The Cumulatively Dangerous Air Pollutant Amendment would first encounter challenges during Congress’s consideration. This Section identifies and addresses those challenges.

150. The EPA has defined “Green Building” as “the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building’s life-cycle from siting to design, construction, operation, maintenance, renovation and deconstruction.” *Green Building: Basic Information*, U.S. ENVTL. PROTECTION AGENCY, <http://www.epa.gov/greenbuilding/pubs/about.htm> [<http://perma.cc/PQ4D-CM46>] (last visited Apr. 3, 2015).

151. Examples of such organizations include BREEAM, CASBEE, Built Green, Green Globes, and Green Star. See Millan, *supra* note 88, at 44 n. 5.

152. U.S. GREEN BUILDING COUNCIL, LEED FOR NEW CONSTRUCTION & MAJOR RENOVATIONS VERSION 2.2, at 65-69 (2005), available at <http://perma.cc/SCL8-UURH>.

1. *Tangled Political Strings*

Although the intricacies of congressional decision making are beyond the scope of this Note, nearly all proposed legislation faces opposition from the industries it will affect. Industries influence lawmakers by winning over their constituents.¹⁵³ As Jack Gerard, a top lobbyist for the American Petroleum Institute, recently noted, “Congress is responsive to the American people.”¹⁵⁴ Public approval has correlated with the successful passage of a number of statutes and amendments despite industrial opposition. The tobacco industry failed to prevent the imposition of the Surgeon General’s Warning,¹⁵⁵ and recently, graphic warnings on cigarette packaging.¹⁵⁶ Similarly, the automobile and coal industries unsuccessfully challenged the 1990 CAA Amendments, which increased national restrictions on carbon emissions.¹⁵⁷ If the determinative factor of success for proposed legislation is public support, the Cumulatively Dangerous Air Pollutant Amendment would most likely be unsuccessful because concern for indoor air quality is relatively new.

Yet Congressional ratification does not necessarily turn on public outcry. For example, the Meat and Poultry Pathogen Reduction and Enforcement Act of 2003 (commonly referred to as Kevin’s Law) garnered widespread support due to both media coverage and its sentimental origins.¹⁵⁸ However, lobbying from the corporate meat

153. See Steven Mufson, *Jack Gerard, the Force Majeure Behind Big Oil*, WASH. POST (Apr. 7, 2012), http://www.washingtonpost.com/business/economy/jack-gerard-the-force-majeure-behind-big-oil/2012/04/06/gIQA1hjC0S_story.html [<http://perma.cc/74AY-L6FP>].

154. *Id.*

155. See 15 U.S.C. § 1333 (2012).

156. See Steven Reinberg, *U.S. Supreme Court Rejects Challenge to New Cigarette Labeling*, U.S. NEWS & WORLD REP. (Apr. 22, 2013, 4:00 PM), <http://health.usnews.com/health-news/news/articles/2013/04/22/us-supreme-court-rejects-challenge-to-new-cigarette-labeling> [<http://perma.cc/WG6U-CBBW>]. Despite the successful passing of the Family Smoking and Tobacco Prevention Act, the graphic warning label requirement is in dispute. Compare *R.J. Reynolds Tobacco Co. v. FDA*, 696 F.3d 1205, 1208 (D.C. Cir. 2012) (holding that the graphic warnings violated the First Amendment), with *Disc. Tobacco City & Lottery, Inc. v. U.S.*, 674 F.3d 509, 518 (6th Cir. 2012) (ruling the labeling requirements were permissible).

157. See Thomas O. McGarity, *EPA at Helm’s Deep: Surviving the Fourth Attack on Environmental Law*, 24 FORDHAM ENVTL. L. REV. 205, 210 (2013).

158. Elizabeth Becker, *Parents of Sickened Children Ask for Tighter Rules on Food*, N.Y. TIMES, Oct. 17, 2002, at A22; FOOD, INC. (Magnolia Pictures 2009). Informally named after Kevin Kowalczyk, a two-year-old who died after eating meat contaminated with *E. coli*, the Act proposed legislation that would strengthen the federal government’s ability to prevent

industry successfully stopped, or at least stalled, congressional approval of the Act.¹⁵⁹ Even though no combination of factors can guarantee the successful adoption of proposed statutes or amendments, Congress appears to readily embrace legislation intended to protect public health from the adverse effects of air pollution, such as the Amendment proposed in this Note.¹⁶⁰

2. Controversies Surrounding Air Quality Cases

Opponents to the proposed Amendment might also deter Congress by claiming it was motivated by “junk science.” Indoor air quality claims have a history of controversial diagnoses and low success rates. By far, the most controversial diagnosis relating to air quality is Multiple Chemical Sensitivity (MCS).¹⁶¹ Health organizations worldwide have conducted extensive and systematic evaluations regarding the validity of MCS diagnoses.¹⁶² To date, none of them have found convincing evidence to support the basis of MCS claims.¹⁶³ Practitioners who believe in its existence describe it as an “environmental intolerance” triggered by stress, fungal infections, viral infections, and cumulative exposure to a plethora of low-level environmental toxic substances.¹⁶⁴ “[I]n the United States, the chemically sensitive have been granted disability status” in certain jurisdictions, but MCS is not a recognized medical diagnosis.¹⁶⁵ This

contaminated meat from reaching consumers. Becker, *supra*.

159. See Becker, *supra* note 158; FOOD, INC., *supra* note 158.

160. See *supra* notes 144-45 and accompanying text.

161. The label MCS was first used in 1987 by Mark Cullen, an American occupational physician. Mark R. Cullen, *The Worker With Multiple Chemical Sensitivities: An Overview*, 2 OCCUPATIONAL MED. 655, 655 (1987). He used it to describe an emerging condition that he observed in workers exposed to chemicals at factories and similar buildings. *Id.*

162. See generally Donald J. McGraw, *Multiple Chemical Sensitivities*, 53 J. OCCUPATIONAL & ENVTL. MED. 103, 104 (2011) (listing the Ministry of Health of the Province of Ontario, Council on Scientific Affairs of the American Medical Association, American Academy of Allergy, Asthma and Immunology, U.S. National Academy of Sciences, World Health Organization, International Society of Regulatory Toxicology and Pharmacology, American Council on Science and Health, Royal College of Physicians, and Royal College of Pathologists as having evaluated the basis of MCS claims).

163. *Id.*

164. *Id.*

165. Tarryn Phillips, “I Never Wanted to be a Quack!” *The Professional Deviance of Plaintiff Experts in Contested Illness Lawsuits: The Case of Multiple Chemical Sensitivities*, 24 MED. ANTHROPOLOGY Q. 182, 184 (2010). Other countries such as Australia do not recognize MCS

status might explain why OSHA ignored its existence in the 1994 proposal discussed above.

MCS, however, is not the only air quality related claim. In contrast to MCS, Building Related Illness (BRI) is widely accepted within medical, as well as scientific, communities, and is clinically defined as an illness that can be traced to a specific source in a building.¹⁶⁶ Legionnaire's Disease is the emblematic example of a BRI,¹⁶⁷ but the label also encompasses asbestosis (a condition that results from asbestos exposure) bronchitis, and even asthma.¹⁶⁸ Somewhat less accepted, but still recognized, is Sick Building Syndrome (SBS).¹⁶⁹ Interestingly, although doctors do not attribute a single cause to the onset of SBS symptoms,¹⁷⁰ they have identified VOCs as a contributing factor.¹⁷¹ Regardless, the substance of the Cumulatively Dangerous Air Pollutant Amendment would not be rooted in MCS, BRI, or SBS claims. Instead the Amendment would use them as historical background to aid in the explanation of the origins of contemporary research that, as explained above, correlates the presence of VOCs to specific negative health effects.

in any form, while others such as Germany and Austria consider it only as a valid physiological diagnosis. *Id.* at 183-84.

166. Loewy et al., *supra* note 26, at 245-46.

167. The first documented case of Legionnaires Disease occurred in 1976 when American Legionnaires contracted a mysterious illness, whose symptoms included pneumonia and high fevers, after leaving a Philadelphia hotel. See Lawrence K. Altman, *20 Flu-Like Deaths in Pennsylvania, 155 Ill, a Mystery*, N.Y. TIMES, Aug. 4, 1976, at A1. Scientists identified the responsible bacterium six months after the initial outbreak, concluding that the illness had spread through the hotel's air-conditioning system. See Lawrence K. Altman, *In Philadelphia 30 Years Ago, an Eruption of Illness and Fear*, N.Y. TIMES, Aug. 1, 2006, at F1.

168. Wright, *supra* note 85, at 255.

169. See *supra* notes 26-29. Specific symptoms associated with sick buildings include nose, throat and eye irritation; fatigue and irritability; asthma or asthma-like reactions; chest tightness; wheezing; dry skin and gastrointestinal problems. See WHO REG'L OFFICE FOR EUR. COPENHAGEN, INDOOR AIR QUALITY: BIOLOGICAL CONTAMINANTS 8-10 (1988) available at <http://perma.cc/QSP9-ZZUJ>.

170. Andrea Apter et al., *Epidemiology of the Sick Building Syndrome*, 94 J. ALLERGY & CLINICAL IMMUNOLOGY 277, 284 (1994).

171. See William J. Mitchell, *CGL Pollution Exclusion Provisions and the Sick Building Syndrome: Despite Valiant Rewriting Efforts, Pollution Exclusions, Absolute or Not, Do Not Always Preclude Liability for a Variety of Ills*, 66 DEF. COUNS. J. 124, 124 (1999). Correlations have also been found linking synthetic compounds, radon, and biological sources to SBS symptoms. *Id.* at 126.

B. Possible Challenges to Future Regulations

Independent of the obstacles to passing an amendment are the future challenges that could be made against the Amendment once it is passed. The text below acknowledges and dismisses potential counterarguments to the regulations the EPA would promulgate if Congress passed the Cumulatively Dangerous Air Pollutant Amendment.

1. Lack of Significant Risk

The lack of severity in the side effects from the regulated activity is one counter argument to any health-related regulation. Specific to possible regulations resulting from the Cumulatively Dangerous Air Pollutant Amendment, challengers could claim that the negative health effects correlated with overexposure to VOCs are either too tenuous or not serious enough to constitute government regulation. In *Corrosion Proof Fittings v. EPA*, the Fifth Circuit struck down the EPA-imposed ban on asbestos, ruling that the agency had not demonstrated that asbestos use posed an “unreasonable risk” to the public.¹⁷² Not all courts hold air quality regulations to such high standards. In fact, in *Industrial Union Department, AFL-CIO v. American Petroleum Institute* (the *Benzene* case), the Supreme Court recognized an example of a less stringent standard.¹⁷³ In the *Benzene* case, the Court made the following statement regarding the phrase “requirement reasonably necessary or appropriate”:

It is [OSHA’s] responsibility to determine in the first instance what it considers to be a “significant” risk. Some risks are plainly acceptable and others are plainly unacceptable. If, for example, the odds are one in a billion that person will die from cancer by taking a drink of chlorinated water, the risk clearly could not be considered significant. On the other hand, if the odds are one in a thousand that inhalation of gasoline vapors that are 2% benzene will be fatal, a reasonable person might

172. See *Corrosion Proof Fittings v. EPA*, 947 F.2d 1201, 1222-23 (5th Cir. 1981); *supra* Part II.C.

173. 448 U.S. 607, 614-15 (1980) (plurality opinion).

well consider the risk significant and take the appropriate steps to decrease or eliminate it.¹⁷⁴

The reasonableness standard enunciated by the Court is much easier for an agency to satisfy than the “unreasonable risk” standard articulated by the Fifth Circuit, and hinges on the relevant statutory language.

American Textile Manufacturers Institute, Inc. v. Donovan (the *Cotton Dust* case) is another Supreme Court decision that addressed the severity of symptoms relating to air quality regulations.¹⁷⁵ In that case, the Court concluded that OSHA had the authority to impose regulations on the cotton industry. OSHA promulgated the regulations in an effort to prevent Byssinosis, a respiratory disease, even though there was “some uncertainty over the manner in which the disease progresse[d] from its least serious to its disabling grades.”¹⁷⁶ Byssinosis is rarely deadly, and in its most frequent form has mild symptoms.¹⁷⁷ Similarly, federal regulation of formaldehyde was promulgated to primarily avoid sensory irritation,¹⁷⁸ another example of the public being protected from non-life threatening health effects. Although critics argue that the severity of the symptoms is most important in a judicial challenge to regulation, it appears that courts emphasize the germaneness of the legislative language, the possibility that the pertinent agency is overstepping its allotted power, and the existence of a causal link between the regulated substance and specific symptoms.

2. *Technological and Economic Feasibility*

Critics of potential regulations could also claim that prohibiting continued manufacture of certain products, or requiring the placement of a warning label, would place an unreasonable technological or economic burden on certain industries. Once more, using *Corrosion Proof Fittings* as an example, courts have struck down

174. *Id.* at 655.

175. *Am. Textile Mfrs. Inst. v. Donovan*, 452 U.S. 490, 495-98 (1981).

176. *Id.* at 497.

177. *Indoor Air Quality*, 59 Fed. Reg. 16,001 (proposed Apr. 5, 1994) (to be codified at 29 C.F.R. pts. 1910, 1915, 1926, 1928).

178. *Id.*

regulations when the agency in question failed to consider less burdensome alternatives.¹⁷⁹ The less burdensome alternatives standard originates from interpretations of the CAA¹⁸⁰ and the OSH Act.¹⁸¹

Technological and economic feasibility are both governed by the same definition,¹⁸² “capable of being done, executed, or effected.”¹⁸³ Central to this counterargument is that the agency imposing the regulation carries the burden of showing, by substantial evidence, that the standard is actually feasible.¹⁸⁴ The “substantial evidence” standard is not insurmountable; the agency does not have to prove feasibility beyond scientific certainty.¹⁸⁵ Additionally, agencies are allowed to “raise standards which require improvements in existing technologies or which require the development of new technology, and [are] not limited to issuing standards based solely on devices already fully developed.”¹⁸⁶

Specific to the sanctions authorized by the Cumulatively Dangerous Air Pollutant Amendment, warning labels have been used to warn consumers of dangerous pollutant emissions for decades and would most likely not be considered an undue economic or technological burden.¹⁸⁷ Additionally, the exemption provided by the Amendment actually encourages a crescendo of economic feasibility, spreading the initial burden that manufacturers encounter among

179. *Corrosion Proof Fittings v. EPA*, 947 F.2d 1201, 1228 (5th Cir. 1991).

180. *See* 42 U.S.C. § 7411(a)(1) (2012) (“[T]he degree of emission limitation achievable through the application of the best system of emission reduction [] (taking into account the cost of achieving such reduction)”; *id.* § 7475(a)(4) (“[T]he best available control technology for each pollutant.”). The OSH Act uses similar language. *See* 15 U.S.C. § 2605(c)(1) (2012) (explaining that the EPA must consider “all relevant aspects of the risk [and] a comparison of the estimated costs of complying with actions taken under this chapter”).

181. *See* 29 U.S.C. § 655(b) (2012) (explaining that OSHA must ensure “to the extent feasible,” that exposure to hazards in the workplace does not harm workers’ health).

182. *AFL-CIO v. OSHA*, 965 F.2d 962, 980 (11th Cir. 1992).

183. *Am. Textile Mfrs. Inst. v. Donovan*, 452 U.S. 490, 508-09 (1981) (quoting WEBSTER’S THIRD NEW INTERNATIONAL DICTIONARY 831 (1976)).

184. *See United Steel Workers v. Marshall*, 647 F.2d 1189, 1266 (D.C. Cir. 1980) (“OSHA’s duty is to show that modern technology has at least conceived some industrial strategies or devices which are likely to be capable of meeting the [standard] and which the industries are generally capable of adopting.”).

185. *Id.* (“[A] standard is obviously not infeasible solely because OSHA has no hard evidence to show that the standard has been met.”).

186. *Soc’y of Plastics Indus., Inc. v. OSHA*, 509 F.2d 1301, 1309 (2d Cir. 1975).

187. *See AM. LUNG ASS’N ET AL.*, *supra* note 18, at 13 (explaining that many items that emit VOCs “carry precautionary labels specifying risks and procedures for safe use”).

their contemporaries and promoting safer and more efficient product technologies.

The potential ban on a product's manufacture is therefore the penalty most vulnerable to feasibility criticisms. However, the likelihood of the imposition of a complete ban is extremely unlikely. More probable would be the suspension of future production of a product line. In this way, instead of permanently discontinuing a product's manufacture, the EPA would be giving the affected party a reasonable amount of time to identify the components of the appliance responsible for the emissions and to redesign them to comply with the new CAA standards.¹⁸⁸ This allotted time for research and development is the equivalent of raising the standards for existing technologies,¹⁸⁹ making them safer for consumer use without constituting an immediate burden on the economy. In fact, researchers have estimated "that the potential financial benefits of improving indoor environments exceed costs by a factor of 18 to 47."¹⁹⁰

Like all new statutory language, counterarguments can be made against the Cumulatively Dangerous Air Pollutant Amendment; however, economic efficiency is a particularly important consideration. To completely understand the impact of the new statutory language, a multitude of factors would need to be balanced: with one decision, Congress could give the EPA authority to promote healthier indoor environments, increase work efficiency, and promote innovation; and on the other hand, Congress could deny the EPA that power, choosing instead to shy away from a spike in immediate manufacturing and research costs. This Note argues that, ultimately, economic efficiency would weigh in favor of the amendment's passage and longevity.

CONCLUSION

Concern for the air outside of buildings has traditionally been at the forefront of environmental disputes—resulting in blockbuster

188. This expectation would be permissible "[s]o long as it presents substantial evidence that companies acting vigorously and in good faith can develop the technology." *United Steel Workers*, 647 F.2d at 1264.

189. See *supra* note 186 and accompanying text.

190. Fisk & Rosenfeld, *supra* note 134, at 158.

films,¹⁹¹ the creation of a national holiday,¹⁹² and federal legislation.¹⁹³ Prior to the 1980s, that narrow focus might have been justified. Yet in 1989, Americans spent 90 percent of their time indoors.¹⁹⁴ That year, only 15 percent of households in the United States had a computer.¹⁹⁵ As of 2012, twenty-five years later, over 78.9 percent of households have at least one computer, if not more.¹⁹⁶ It seems more than likely that the Americans spend more time indoors now than ever been before.

Recognizing this shift in American activity, the scientific community began conducting indoor air quality research in the 1980s. Through the years, those studies have progressed from producing generalized findings regarding Sick Building Syndrome, to specific quantifications demonstrating exact VOC emission levels from electronics and other indoor appliances. Additional research demonstrated that human exposure to high concentrations of VOCs can result in a wide spectrum of negative health effects, ranging from headaches to death.

Unfortunately, the legal community has failed to keep pace with both the habits of the average American, as well as the described scientific findings. Today, the agency with the most regulatory power over VOCs, the EPA, does not regulate indoor air quality. OSHA, the only other agency to regulate indoor VOCs, merely promulgates standards for air quality in industrialized settings. The Cumulatively Dangerous Air Pollutant Amendment, proposed in this Note, addresses that impermissible gap by expanding the EPA's regulatory authority to indoor settings, thereby bridging the disconnect between outdoor emissions and appliances in industrial, as well as nonindustrial settings. If successfully executed, the new statutory

191. See, e.g., AN INCONVENIENT TRUTH (Lawrence Bender Productions 2006); THE LORAX (Universal Pictures 2012).

192. See *Earth Day: The History of A Movement*, EARTH DAY NETWORK, <http://www.earthday.org/earth-day-history-movement> [<http://perma.cc/E6WE-7TG8>] (last visited Mar. 14, 2015).

193. See *supra* Part II.A.

194. OFFICE OF AIR AND RADIATION, *supra* note 11, at i.

195. *Table 4: Households with a Computer and Internet Use: 1984 to 2012*, U.S. CENSUS BUREAU, <http://www.census.gov/hhes/computer/files/2012/table4.csv> [<http://perma.cc/TG98-XKMM>] (last visited Apr. 3, 2015).

196. U.S. Census Bureau, *Computer & Internet Trends in America* (Feb. 3, 2014), http://www.census.gov/hhes/computer/files/2012/computer_use_infographic_FINAL.pdf [<http://perma.cc/A9HW-2YCR>].

language would exemplify the proactive approach necessary to protect public health—resulting in a healthier, more industrious population and a more efficient, innovative commercial market.

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