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## Chlorofluorocarbon and Its Effects on the Ozone Layer: Is Legislation Sufficient to Protect the Environment

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## Chlorofluorocarbon and Its Effects on the Ozone Layer: Is Legislation Sufficient to Protect the Environment?

### INTRODUCTION

"Today's weather will be fair skies, temperature 90 degrees and the ultraviolet light index is high;" the television announcer tells the viewing audience. He continues, "Warning: do not go outdoors without protective clothing and eye protection or risk severe burns and cancer." The place is North Carolina and the time is December, 2005. The ozone layer which once protected us from the sun's harmful ultraviolet light has all but vanished. This is not some scene from a science fiction movie. It can become a reality unless Chlorofluorocarbons are eliminated soon.

The earth is surrounded by an atmosphere which contains a number of layers. Once such layer is called the stratosphere.<sup>1</sup> The majority of the earth's ozone is found in the stratosphere.<sup>2</sup> Stratospheric ozone<sup>3</sup> protects the earth from harmful ultraviolet rays.<sup>4</sup> Chlorofluorocarbons<sup>5</sup> (CFC), because of its nature,<sup>6</sup> destroys this protective layer.<sup>7</sup> Ozone depletion is probably the most potentially harmful environmental threat today. The problem is not new but yet received only heightened attention in the late 1970's and today. It is so severe that it can affect plants, animals, food chains, human health and even our climate.<sup>8</sup> The earth's environment is delicately balanced. Harms which seem to have only a direct affect on one segment of the environment can indirectly affect many other segments. For example ozone is depleted by CFC's which in turn causes harmful ultraviolet light to penetrate through the atmosphere. Plankton are adversely affected by harmful ultraviolet light,<sup>9</sup> and as a result they

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1. A. Makhijani, *Saving Our Skins, Technical Potential and Policies for the Elimination of Ozone Depleting Chlorine Compounds* (1980). The stratosphere is an atmospheric layer between 10 to 50 kilometers above the earth's surface. The troposphere is between the stratosphere and the earth's surface. *Id.* at 167.

2. *Id.*

3. Ozone consists of three atoms of oxygen. The air we breath contains two atoms of oxygen. *Id.* at 166.

4. *Id.* at 22. Sunlight is composed of many wavelengths of light. One such wavelength is ultraviolet light. The ultraviolet light causes the harm. *Id.*

5. Chlorofluorocarbons are man made chemicals which enter the stratosphere upon release over the earth's surface. *Id.* at 39.

6. *See infra* note 18 for a description of the chemical reaction.

7. Makhijani, *supra* note 1, at 26. The ozone layer is not exactly a layer but is referred to as a layer in most literature. It occurs in the stratosphere at a concentration of 1 to 10 parts per million. *Id.* at 166.

8. *Id.* at 66-67.

9. *Id.* at 60-62.

perish. A number of fish and mammals survive on plankton so they will perish. Other fish will also die as a result of this break in the food chain.<sup>10</sup> In addition, plankton add oxygen to our atmosphere.

The extent of the harms caused by CFC's depleting the ozone layer is of tremendous proportions. The CFC harms are serious because it affects almost all segments of the earth's environment either directly or indirectly. One may ask if CFC's could cause the destruction of life as we know it, why have they not been totally outlawed? There are at least three reasons why CFC's have not been totally outlawed. The first being that due to the complexity of the harm there was confusion as to whether the dire predictions of some environmentalists were correct. The second reason is because CFC usage has become a way of life for the United States and most countries with the exception of the third-world countries. CFC's are all around us in our refrigerators, air conditioning units, chairs we sit on, in our walls as insulation, in our food packaging, medical devices, and a multitude of other items.<sup>11</sup> It is impossible to avoid products manufactured from CFC's or with CFC's.

The last reason why CFC's have not been totally outlawed pertains to politics. Because of some uncertainty of CFC's effects and the extent CFC's have on our lives, legislation has been slow to non-existent.<sup>12</sup> Most major chlorofluorocarbon manufacturers today realize the danger of CFC's and have put in place plans to substitute them. In addition, legislation is either in place or being enacted at the local, state, federal and international level.

This article poses the question: Whether current or proposed legislation on CFC's manufacture and usage is enough to eliminate the harms to the environment. The question will be answered through looking at the past, present and future CFC legislation. The chemical started out as a tremendous benefit but could end up as the greatest detriment mankind has ever experienced. It will take unprecedented cooperation on a global level for any correction of the problem. Finally, the United States and other countries are realizing that they cannot take a compartmentalized approach to the environment, hopefully it is not too late.<sup>13</sup>

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10. *Id.*

11. Alliance for responsible CFC policy, Chlorofluorocarbons: The Case for Responsible Policy at 2-3 [hereinafter Alliance: Chlorofluorocarbons].

12. See *infra* note 90 and accompanying text.

13. S. 201, 101st Cong., 1st Sess. (1989). It was finally realized, by at least some in the United States, that our environment knows no boundaries. The environmental harm which is caused by one country does not stay behind that country's boundaries. Environmental harms for the most part are global in nature. *Id.*

## I. BACKGROUND

A. *Historical Discovery of Ozone Depletion*

The first CFC was produced in 1931 as a result of an intensive search to find a safe refrigerant.<sup>14</sup> In the early 1970's, James Lovelock discovered that CFC's were in the atmosphere.<sup>15</sup> He theorized that this would not be a problem because the ozone layer would protect the CFC's from being broken down.

In 1973, two scientists named Rowland and Molina discovered that CFC's were far from harmless in the stratosphere. They determined that when the CFC's are exposed to ultraviolet light they broke down into three constituent components: chlorine, fluorine and carbon.<sup>16</sup> The reaction which occurred was devastating. For each chlorine molecule, 100,000 molecules of ozone were destroyed.<sup>17</sup> The main reaction is unique in that the chlorine molecule gets used over and over again as it destroys more and more ozone.<sup>18</sup> Later it was discovered that halons are even more dangerous. Halons can deplete as much as 10 times the amount of ozone as CFC's.<sup>19</sup> The two scientists went on a campaign to reduce the depletion of the ozone layer. In 1978, they finally caused the enactment of legislation to eliminate CFC's used in aerosols in the United States.<sup>20</sup>

During this same time, a scientist by the name of Farman was studying the atmosphere above Antarctica. Farman started studying the atmosphere in 1957 and made a discovery in 1977. He discovered that the atmosphere above the Antarctic was being depleted of massive amounts of ozone.<sup>21</sup> The depletion amounted to a hole above Antarctica.<sup>22</sup> His recordings were not published until 1985 because of his own fear that the data was incorrect. After his paper was published, NASA reviewed its satellite data and found it purposely programmed the computers to reject low levels of ozone in the stratosphere.<sup>23</sup> This was why NASA was not aware of ozone depletion earlier.

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14. Alliance: Chlorofluorocarbons, *supra* note 11, at 5. CFC's are non-flammable, non-explosive, non-corrosive and low in toxicity. *Id.* at 11.

15. Shell, *Watch This Space*, OMNI, July, 1987, at 38.

16. *Id.* at 38, 39.

17. *Id.*

18. Makhijani, *supra* note 1, at 27. The reaction occurring is chlorine (Cl) converts ozone (O<sub>3</sub>) into oxygen (O<sub>2</sub>) and chlorine monoxide (ClO) by pulling off an oxygen atom (O). So that what remains is ClO and O<sub>2</sub>. The oxygen atom in the ClO attracts other oxygen atoms (O) and breaks off from the chlorine monoxide (ClO) to form Cl and O<sub>2</sub>. The reaction to destroy ozone begins over. *Id.*

19. *Id.* at 113. One halon molecule can destroy one million ozone molecules. *Id.*

20. Certain Fluorocarbons As Propellants In Self-pressurized Containers: Prohibition On Use, 43 Fed. Reg. 11,301 (1978).

21. Shell, *supra* note 15, at 41.

22. *Id.* The hole was the size of the continental U.S. *Id.*

23. *Id.* at 42.

In 1986, a scientist by the name of Soloman discovered that there was 20 to 50 times more chlorine above the Antarctic than should be expected.<sup>24</sup> In 1988, a team headed by a scientist named Anderson determined that CFC's were the cause of this hole.<sup>25</sup> The last remaining large bit of research was conducted by a group of scientists called the Ozone Trends Panel. This panel of world-wide scientists discovered that ozone had depleted in the Northern Hemisphere by as much as 3% and as much as 5% in the Southern Hemisphere.<sup>26</sup> The final finding of ozone depletion occurred on February 17, 1989. Scientists discovered "incredible concentration of CFC's in the North Pole capable of destroying 1% of ozone per day."<sup>27</sup> The Arctic reaction was attributed to the same phenomena occurring in the Antarctic; polar stratospheric clouds.

## B. CFC's Users And Use

### 1. Users

The total use of CFC's in the world in 1985 was 1,036,000 kilograms. The United States uses 28.9%; USSR 14%; China and Indonesia 1.8%; Europe, Japan, Canada, Australia, New Zealand 40.9%; and the remaining countries use 14.3%.<sup>28</sup>

The usage is split up in the United States as follows: Aerosols, 35%; Refrigerants, 20%; Blowing Agents, 25%; and Cleaning Agents/other, 20%.<sup>29</sup> The world use is: Aerosols, 55%; Refrigerants, 20%; Blowing Agents, 20%; Cleaning and Other, 5%.<sup>30</sup> Aerosols were not banned world-wide in 1978, only the United States banned aerosols. The above estimates do not include halons.

### 2. Uses

The products made from CFC's are extensive; such as: auto air conditioners; home and office air conditioners; teflon; cleaning agents for metal and computer parts; sterilants; foam for chairs; styrofoam products i.e.: egg cartons, meat containers, coffee cups; insulation in walls, refrigerators, food freezers and others. Halons are used for fire extinguishes. The above list does not include products made with CFC's which is even

24. *Id.*

25. Protection of Stratospheric Ozone, 53 Fed. Reg. 30,604 (1988) (to be codified at 40 C.F.R. pt. 82) (proposed Aug. 12, 1988) [hereinafter: Advance Notice, 1988 Rule]. The hole was theorized as being caused by polar stratospheric clouds only found in the South Pole. Shell, *supra* note 15, at 38.

26. Advance Notice, 1988 rule, *supra* note 25, at 30,605.

27. See L.A. Times, February 18, 1989, at 1, col. 1.

28. Makhijani, *supra* note 1, at 74-76.

29. Alliance for Responsible CFC Policy, Volume by Industry (1986).

30. *Id.*

more extensive. Usage of halons and CFC's have become a way of life in many countries.

With every environmental issue arises a balance. The following figures show how dependant we are and what losses we can expect from CFC elimination: 5,000 businesses use CFC's at 375,000 locations; 28 billion dollars worth of goods are produced with CFC's and 715,000 jobs are directly related to CFC's.<sup>31</sup> The EPA projected in its risk assessment that it would cost 27 billion dollars to eliminate CFC's but that if CFC's were not eliminated it could cost 29 billion to 340 trillion dollars.<sup>32</sup> This figure was based on the costs from 1989 to 2075.

Manufacturing CFC's are a cause of ozone reaching the stratosphere to do damage. Additional causes are: burning CFC's, leaky air conditioners, Freon cleaning without recycling and crushing up of cars and refrigerators. Each one of these activities cause CFC's to be released into the air and eventually reach the stratosphere causing depletion of the ozone layer.

### C. Damage

#### 1. Atmospheric Damage

Ozone itself is registered as an air pollutant. Under the Clean Air Act, 0.15 to 0.35 ppm of ozone causes adverse health consequences.<sup>33</sup>

As mentioned earlier, ozone depletion has already occurred in the Northern Hemisphere as much as 3% and in the Southern Hemisphere as much as 5%. Switzerland and Germany have found ozone depletion as high as 8 and 7% respectively.<sup>34</sup>

Chlorine levels in the atmosphere are anticipated to grow under the current legislation, from the 1989 levels of 2.7 ppbv, to 8 ppbv by 2075, if methyl chloride is not regulated.<sup>35</sup> Even with the eliminations of methyl chloride, chlorine emissions will grow to 6 ppbv.<sup>36</sup> Halons will grow from 1 pptv to 6 to 13 pptv by 2075 under the current legislation.<sup>37</sup>

Damage estimates have a tendency to be inaccurate for many reasons. One such reason is the life expectancy of such compounds. Ozone depleting chemicals now known have life expectancies ranging from 6.5

31. Alliance: Chlorofluorocarbons, *supra* note 11, at 5.

32. Protection of Stratospheric Ozone, 52 Fed. Reg. 47,489 (1987) (to be codified at 40 C.F.R. pt. 82) (proposed Dec. 14, 1987) [hereinafter: EPA Proposed Rule, 1987].

33. Air Pollutants, 43 Fed. Reg. 26,966 (1978).

34. Comment, *The Problem of Ozone Depletion — Is There an International Legal Solution?*, 12 N.C.J. INT'L L. & COM. REG. 433, 435 (1987).

35. J. Hoffman and M. Gibbs, *Future Concentration's of Stratospheric Chlorine and Bromine* (1988). For a description of the current legislation, see *infra* note 99 and accompanying text.

36. *Id.* at 1 PPBV is parts per billion by volume.

37. *Id.* at 3. PPTV is parts per trillion by volume.

years for methyl chloride to 380 years for CFC 115.<sup>38</sup> Also, the fact that it takes 6 to 8 years for 63% of the CFC to reach the stratosphere to do damage and the other 37% takes even longer.<sup>39</sup> Another reason is the inaccuracy of atmospheric models. The only real means of determining the effects are through direct measurements.

In addition to the ozone global depletion, there is a hole over the Antarctic.<sup>40</sup> Further, there is a high potential for a hole over the Arctic with losses of 1% per day of ozone.<sup>41</sup> There are other sources of ozone depletion. Natural sources of ozone depletion are methyl chloride from the oceans and burning vegetation plus hydrochloric acid from volcanos.<sup>42</sup> The damage to the atmosphere is directly related to damage of plants, animals and humans.

## 2. Plants, Animal, Human and Climatic Damage

The damage comes from ultraviolet light. The ozone layer protects us from ultraviolet light by absorbing this light. A lesser amount of ozone is directly proportionate to greater amounts of ultraviolet light penetrating and causing damage on earth. The formula to compute damage is a 1% decrease in ozone equals a 2% increase in harmful ultraviolet radiation.<sup>43</sup>

Plant damage has not yet been fully determined with the exception of plankton. Plankton are sensitive to ultraviolet light (UV), a 10% increase in UV light equals a 2.5 to 5% loss of life.<sup>44</sup> Aquatic animal life is affected as much or worse. A 7.5% reduction in ozone yields a 50% reduction in shrimp.<sup>45</sup> These figures have other more severe implications because the plankton are members of the food chain. The loss of plankton leads to losses of other higher life forms. Soybean crops have been predicted to lose about 1% yield for each 1% decrease in ozone.<sup>46</sup>

There is also damage in the form of blindness due to the UV light. In humans, the eye could be damaged in a multitude of ways. The damage can lead to permanent blindness. In addition, tumors are caused by UV

38. E.P.A. Proposed Rule, 1987, *supra* note 32, at 47496.

39. Hoffman and Gibbs, *supra* note 35, at 29.

40. The Alliance contends that the hole occurs only 2 months a year. The National Resources Defense Counsel (NRDC) stated that the hole could not disappear without 100% elimination of CFC. Many other sources made it appear that the hole exists permanently. In "Future Concentrations" they did propose that the hole draws ozone from global sources. It would appear that the hole will exist continually each season for two months unless we drastically cut CFC's. Hoffman and Gibbs, *supra* note 35, at 6.

41. For a description of the Arctic hole phenomena, see L.A. Times *supra* note 27, at 1, col. 1, and accompanying text.

42. Makhijani, *supra* note 1, at 39. The natural omissions of chlorine are approximately 30%. The earth has an ozone replenishing mechanism, but man has over burdened that mechanism. *Id.*

43. *Id.* at 66.

44. *Id.* at 67.

45. *Id.*

46. *Id.*

lights' damage to the cornea.<sup>47</sup> Finally, a 1% increase in UV light causes a 0.5% increase in cataracts which could lead to blindness.<sup>48</sup>

Cancer in humans would increase significantly with ozone depletion. For every 10% increase in UV light leads to a 7.5% increase in the deadly form of cancer melanoma.<sup>49</sup> In addition, a 10% increase in UV light equals a 10% increase in basal and squamous cell cancer.<sup>50</sup> Infectious diseases would increase because UV light weakens the immune system.<sup>51</sup> The greenhouse effect would be increased. CFC's have a high potential for trapping infrared light. One CFC molecule traps more infrared light than thousands of molecules of carbon dioxide.<sup>52</sup> As a result, the temperature is predicted to rise 0.3 degrees Celsius over the next hundred years.<sup>53</sup>

Furthermore, outdoor paints would be affected. The UV stabilizers would be insufficient to withstand increases in UV light.<sup>54</sup> Lastly, the ozone in the troposphere, the atmospheric layer next to land, would increase.<sup>55</sup> The result is higher respiratory problems in humans.

The hazard to humans is too severe. We can not anticipate all the effects of ozone depletion. We know that bacteria and viruses may mutate and form new deadly diseases. Even without such theories, the damage caused by ozone depletion could cause millions of deaths.

## II. LEGISLATION

### A. Early legislation — The Aerosol Ban

#### 1. Federal Legislation

As mentioned earlier, Rowland and Molina's discovery of CFC's potential for harm was the primary cause of the aerosol legislation. Aerosols were targeted for elimination because in the 1970's it represented 50% of all CFC usage.<sup>56</sup>

The legislative history of the aerosol laws began in 1975 when the first bill was introduced, H.R. 3118, 94th Cong., 1st Sess. (1975) to the Com-

47. *Id.* at 56.

48. *Id.* at 66.

49. *Id.*

50. *Id.*

51. *Id.* at 50.

52. *Id.* at 43. Carbon dioxide is a greenhouse gas. *Id.*

53. *Id.* at 44. Note: Other estimates have said that the temperature will rise 1.5 degrees Celsius to 5 degrees Celsius. Makhijani, *supra* note 1, at 65. These increases would cause flooding and tremendous climatic changes. *Id.* It has been suggested that the 1988 drought was partially caused by CFC's. *Id.*

54. Makhijani, *supra* note 1, at 66.

55. *Id.* The surface ozone increase is predicated on the theory that increased UV penetration will stimulate the formation of surface ozone. *Id.* at 44.

56. E.P.A. Proposed Rule, 1987, *supra* note 32, at 47,490.



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mittee on Science and Technology.<sup>57</sup> Out of the committee came H.R. Rep. No. 575, 95th Cong., 1st Sess. (1975).<sup>58</sup> The findings of that bill were that the ozone layer was depleted 1%.<sup>59</sup> In addition, ozone depletion could cause health risks of cancer in humans, plant damage and animal problems.<sup>60</sup> The report reviewed some of the findings of the scientific community and the business community. Dupont was represented by Dr. Theodore Cairnes. Dr. Cairnes stated that it is unknown how chlorine depletes ozone and that the process is not any faster than the natural break down process.<sup>61</sup>

H.R. 3118, Sec. 107, was the predecessor to H.R. 6161, Sec. 107, 97th Cong. 1st Sess. (1977)<sup>62</sup> which amended the Clean Air Act. The section is identical with the exception that the EPA Administrator could exempt by regulation medical products for which there were no substitutes. Section 107 of H.R. 6161 allowed for a two year government study.<sup>63</sup> The primary focus of the study was to determine all the effects of ozone depletion on the earth.

The Environmental Protection Agency (EPA) Administrator was given the authority under Sect. 154 of H.R. 6161 to "propose regulations for the control of any substance which may reasonably be anticipated to affect the stratosphere. . . if they find that such effect . . . may reasonably be anticipated to endanger public health or welfare."<sup>64</sup> The Administrator could act before the 1979 scientific study was to be completed under the authority of the Toxic Control Substance Act.<sup>65</sup> Also, the President was given the authority to enter into international research agreements aimed at protecting the stratosphere.<sup>66</sup>

The amended Clean Air Act gave the Administrator authority to regulate aerosols under the Toxic Control Substance Act, 15 U.S.C. 2601 et. seq.<sup>67</sup> The states were allowed to regulate aerosols, as long as they enacted regulations identical or more stringent than the Clean Air Act.<sup>68</sup>

In May of 1977, the EPA proposed rules to eliminate fully halogenated

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57. See H.R. Rep. No. 294, 95th Cong., 1st Sess. 2, reprinted in 1977 U.S. CODE CONG. & ADMIN. NEWS 1077, 1172 [hereinafter Clean Air Act].

58. *Id.*

59. *Id.* at 1173.

60. *Id.* at 1173-74.

61. *Id.* at 1176.

62. *Id.* at 1172.

63. *Id.* at 1177-78.

64. Clean Air Act, *supra* note 57, at 1178. The Administrator of the E.P.A. did not need volumes of scientific, concrete evidence. It was known at that time that this would be a practical impossibility. The law gave the Administrator some flexibility in determining the hazard. *Id.*

65. *Id.* at 1179.

66. 42 U.S.C. § 7456 (1982).

67. 42 U.S.C. § 7458 (1982).

68. 42 U.S.C. § 7459 (1982).

chlorofluorocarbons (aerosols).<sup>69</sup> The final rule came out in March of 1978. The EPA, Food and Drug Administration (FDA) and Consumer Product Safety Commission together came out with final rules banning CFC's used as aerosol propellants. Under the EPA's ruling, the Administrator made findings that "aerosol discharges represent an unreasonable risk of injury to health and the environment."<sup>70</sup> The ban prohibited all non-essential uses of propellants. The essential uses were listed in part 761.21 of the rule.<sup>71</sup> Exports were prohibited as of 12/15/78.<sup>72</sup> The exports were only limited to the chemical, CFC. Articles containing CFC's as a propellant were not banned.<sup>73</sup> Imports of the chemical and products were banned as of 12/16/78.<sup>74</sup>

This was the first phase of the EPA's ban of CFC's. A second phase was to review all CFC's for proposed elimination.<sup>75</sup> The second phase was initiated because of scientific findings that if controls were not initiated ozone depletion would be as much as 11 to 16 percent by the year 2075.<sup>76</sup>

The EPA did not have the authority to ban food, drugs, cosmetics or devices. So the FDA came out with its own final regulations the same day.<sup>77</sup> Previously, the FDA published a warning label requirement in April of 1977.<sup>78</sup> It's final regulation called for the banning of all but five product types which used CFC's as propellants.<sup>79</sup> The FDA additionally published answerers to comments concerning its rule. One such question was concerned with the use of 1-D models to determine ozone depletion.<sup>80</sup> The Commissioner of the FDA recognized that the atmospheric models used to show ozone depletion estimates were far from perfect but chose to use the model 1-D type in the absence of anything better.<sup>81</sup>

The Consumer Products Safety Commission came out with a state-

69. Fully Halogenated Chlorofluoroalkanes, 40 C.F.R. § 762.45 (1988).

70. Fully Halogenated Chlorofluoroalkanes, 43 Fed. Reg. 11,318, 11,319 (1978) (codified at 40 C.F.R. § 762.25) [hereinafter E.P.A. Final Rule, 1978].

71. Prohibitions, 40 C.F.R. § 761.20 (1988).

72. E.P.A. Final Rule, 1978, *supra* note 70, at 11,321.

73. *Id.*

74. *Id.* at 11,321.

75. *Id.* at 11,319.

76. *Id.*

77. Certain Fluorocarbons (Chlorofluorocarbon) in Food, Food Additives, Drugs, Animal Food, Animal Drugs, Cosmetics, and Medical Device Products As Propellants In Self-Pressurized Containers, 43 Fed. Reg. 11301 (1978) [hereinafter F.D.A. Fluorocarbons, 1978].

78. *Id.* at 11301. The products were metered dose steroids for nasal inhalation/oral inhalation, metered dose bronchodilator drugs, metered dose ergotamine tartrate drugs and contraceptive foams.

79. F.D.A. Fluorocarbons, 1978, *supra* note 77, at 11,316.

80. *Id.* A 1D Model means a one dimensional model. Many criticized the use of a one dimensional model in a three dimensional atmosphere. *Id.*

81. *Id.*

ment concerning the use of propellants in consumer products.<sup>82</sup> It stated that there was no need to ban consumer products. The fact that the EPA, under the Toxic Control Substances Act, banned the chemicals used as propellants was sufficient to preclude finished product from regulation. In addition, the EPA specified which products were deemed essential use and could use CFC's as propellants.<sup>83</sup>

## 2. State Legislation — Aerosols

The Clean Air Act allowed states to regulate aerosols but only to the extent they were identical and not less restrictive than the Act. Five states enacted laws restricting products which contain CFC's as an aerosol propellant.<sup>84</sup> The state laws restricted the sale of products which contained CFC's as aerosols. This was more restrictive than the EPA required. The EPA banned the manufacture of the propellants; not the products. In addition, the states had exempted basically all drugs from regulation.

## 3. Case Law

There is only one case dealing with the aerosol ban. That case was *Cosmetic Toiletry and Fragrance Assoc. v. Minnesota*.<sup>85</sup> The issue was whether federal law requiring the placement of warning labels, preempted state laws requiring the placement of labels. The court decided that the state law was preempted by the FDA regulations.

The reason why no manufacturer balked at the aerosol regulation was because by the time the regulation was enacted usage had dropped in approximately 20%.<sup>86</sup> Also, the manufacturers were glad to drop the use of CFC in aerosols because it was more expensive than the alternative, hydrogen.<sup>87</sup>

## 4. The Absence of Legislation Concerning Other CFC's

It is of critical importance to review the past CFC legislation before embarking upon a review of more current legislation. By this review, it

82. Fully Halogenated Chlorofluoroalkanes As Propellants in Aerosol Consumer Products, 43 Fed. Reg. 11,326 (1978) [hereinafter Consumer Products Comments, 1978].

83. See Fully Halogenated Chlorofluoroalkanes, 40 C.F.R. § 762.58. The products were mercapton stench warning devices, release agents for molds, flying insect pesticides, diamond grit spray, coatings, articles for safe maintenance of our aircraft, essentials for military use, pharmaceutical rotary table lubricants, automatic time release insecticides and dispensing systems for stored tobacco. *Id.*

84. See State Air Laws, Env't Rep. (BNA) No. 2, at S-53, S-96; No. 3, at S-80, S-82, S-109 (1978-1088). The five states were Michigan, Ohio, New York, Minnesota, and Oregon. *Id.*

85. 11 Env't Rep. Cas. (BNA) 1698 (1978).

86. F.D.A. Fluorocarbons, 1978, *supra* note 77, at 11,318.

87. Telephone interview with Allen Carpein, Attorney for the E.P.A. in Washington, D.C. (Feb. 9, 1989).

was shown that the EPA Administrator had the power to enact legislation in 1979 banning substances and activities which could affect stratospheric ozone. In addition, the EPA had a two phase proposal regarding all CFC's. Phase II would review the banning of other CFC's.

The EPA in October of 1980, published its Advance Notice of Proposed Rules to freeze production of CFC's.<sup>88</sup> It was not until August of 1988 that the EPA came out with a final rule regarding the freeze on CFC manufacture. What happened for eight years? An urgent problem such as this should not have taken eight years to resolve. As part of the two year study, the National Academy of Science in 1979 found ozone depletion was projected to be as high as 16.5% in the future.<sup>89</sup> It is believed that the primary reason for the delay was the Reagan-Bush anti-regulation, pro big business ticket.<sup>90</sup> The ticket survived for eight years and so did the philosophy. Only when the U.N. enacted the Montreal Protocol did the EPA promulgate regulations regarding the freeze. In addition, the regulations were no more prohibitive than was called for in the Montreal Protocol.

Against this background of pro-environmental lobbying groups blaming Reagan for the delay, was the EPA's own version of why it did not react. The EPA stated, the concern for regulation lessened as a result of the data that showed some gases buffer the effects of CFC's<sup>91</sup> In addition, it felt that CFC's use world-wide had remained constant and economic conditions reduced the rate of growth in non-aerosol uses.<sup>92</sup> Yet, in the next paragraph, the EPA states world-wide production has grown by 5% each year beginning in 1983.<sup>93</sup> Other valid reasons for the delay are probably: confusing data, no real confirming evidence until 1986, stratospheric models under estimating damage and finally the time it takes for legislation to be enacted.

The Chairman of E.I. Dupont de Neumour and Company sums up the confusion in the following statement: "[a]nalysis of actual measurements found no persistent trends in ozone levels, supporting the belief there would be no significant changes in ozone in the near term. Then another set of calculations suggested a 15 to 20 percent ozone depletion by the end of the next century. If all of this sounds confusing, rest assured it was. For some years there was no clear consensus and in remaining true to our corporate culture, [we insisted] that policies should be based on

88. Advance Notice of Proposed Rule Making, CFC — Freeze on Production, 45 Fed. Reg. 66,726 (1980). See E.P.A. Proposed Rule, 1987, *supra* note 32, at 47,490.

89. Makhijani, *supra* note 1, at 13.

90. *Id.* The Environmental Policy Institute feels strongly that the Reagan-Bush Ticket was the cause of the lack of legislation. *Id.*

91. E.P.A. Proposed Rule, 1987, *supra* note 32, at 47,490.

92. *Id.*

93. *Id.*

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good science, not speculation."<sup>94</sup>

There was much confusion, not just in the data, but how it was reported. The papers were in parts per billion of chlorine, percent depletion of ozone, ultraviolet light increases and for varying time intervals. There were so many scientists involved independently that it was hard to get a true representation of what was occurring other than depletion was occurring at some level. Dupont investigated the possibility of CFC substitutes in 1980, but suddenly stopped.<sup>95</sup> Probably, implied deregulation by the Reagan Administration caused the lack of interest in further researching CFC substitutes.<sup>96</sup>

## B. Current Legislation — The Montreal Protocol

### 1. International Legislation

The United Nations Environmental Programme (UNEP) began negotiations aimed at reducing the threat of CFC's.<sup>97</sup> An agreement was reached in 1985 called the Vienna Conference.<sup>98</sup> The Conference called for international cooperation in research. The United States ratified this treaty in 1986.

It was not until September 16, 1987 that the Montreal Protocol was signed. Thirty-one countries signed the Protocol.<sup>99</sup> The amount of countries that participated was fifty-seven.<sup>100</sup> There were four resolutions adopted: 1. A tribute to Canada for holding the conference; 2. Exchange of the technical information between countries; 3. A requirement to report data on the export, import and production of controlled substances;<sup>101</sup> 4. The actual Protocol.<sup>102</sup>

It will only be necessary to explore the reporting requirements and actual Protocol. The reporting requirements were based on 1986 levels of production, imports and exports.<sup>103</sup> The Protocol required that within

94. Address by R.E. Heckert, Chairman of E.I. Dupont de Nemours and Company, Dean's Seminar, Rice University, (Nov. 2, 1988).

95. Makhijani, *supra* note 1, at 13.

96. "As Late as May, 1987, Secretary of the Interior Donald D. Hodel remarked that an agreement was unnecessary and that people should wear sunglasses and sun screen instead." Sorenson, *International Agreements — Montreal Protocol on Substances that Deplete the Ozone Layer*, 29 HARV. INT'L L.J. 185, 186, n.3 (1988).

97. Ogden, *The Montreal Protocol: Confronting the Threat to Earth's Ozone Layer*, 63 WASH. L. REV. 997, 1002 (1988).

98. *Id.*

99. *Id.* at 1001.

100. Montreal Protocol on Substances That Deplete the Ozone Layer, Opened for Signature, Sept. 16, 1987 [hereinafter Protocol].

101. Controlled substances in the Protocol constituted various CFC formulations. *Id.* at 23.

102. *Id.* at 7-10.

103. *Id.* at 14. The chemicals to be monitored were broken down into 2 groups. Group I consisted of CFC 11 [ozone depletion potential (ODP) = 1.0], CFC 12 (ODP = 1.0), CFC 113 (ODP = 0.8), CFC 114 (ODP = 1.0), CFC 115 (ODP = 0.6). Group II consisted of halon 1211 (ODP =

6 months from its adoption, the signatories would meet to recommend how to report data on the controlled substances.<sup>104</sup> The Protocol's purpose was to protect human health and the environment against affects of human activities likely to modify the ozone layer.<sup>105</sup> A freeze was proposed at the following levels; Group I: 1990, freeze consumption and production at 1986 levels; 1994, consumption and production was to be frozen at 80% of 1986 levels; 1999, consumption and production was to be frozen at 50% of 1986 levels; Group II: 1992 freeze at 1986 levels.<sup>106</sup> It was important to determine what 1986 levels were because all cuts were based upon 1986 levels. The Protocol did not freeze methyl chloroform or carbon tetrachloride which had a high potential for ozone depletion. Also, halons, Group II chemicals, were frozen at 1986 levels *not* cut, even though their ozone depletion potential was devastating.

Additional elements of the Protocol regarding CFC's were: 1990, ban on all imports of CFC's by members not a party to the Protocol; 1993, no party in a developing country could export to non-party members; 1992, required reporting of all products containing CFC's and in 1994, determining the feasibility of banning all products from countries not a party to the Protocol.<sup>107</sup> The Protocol allowed countries which had CFC facilities in the process of being built prior to September 16, 1987 to add that facilities CFC production to its 1986 levels.<sup>108</sup>

Article 5 of the Protocol allowed developing countries the right to postpone the freeze and cuts for ten years from January 1, 1989.<sup>109</sup> The only drawback was they could not exceed .3kg of CFC's per person or the average consumption in the years between 1995 to 1997; which ever was lower.<sup>110</sup> This exemption had ramifications on the non-developing countries. It allowed the non-developing countries to produce 10% in excess of its needs to support developing countries and 15% in excess after 1998.<sup>111</sup> The Protocol, with its cuts and freezes, was not restrictive considering the potential for harm. The problem which UNEP faced was trying to get international support. In addition, it was difficult to get undeveloped countries not using CFC's to stop their development. The undeveloped countries were not the cause of the problem but yet have to suffer the consequences.

3), halon 1301 (ODP = 10), halon 2402 (ODP not yet determined). The ozone depletion potential was a calculation based on the amount of potential each chemical has to deplete ozone using CFC 11 as the standard. *Id.*

104. *Id.* at 9.

105. *Id.* at 12.

106. *Id.* at 14.

107. *Id.* at 15-17.

108. *Id.* at 15.

109. *Id.* at 17-18.

110. *Id.* at 17.

111. *Id.* at 14.

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Eleven countries were needed to ratify the Protocol by January 1, 1989 or at least countries representing two-thirds of the world's 1986 consumption.<sup>112</sup> By December, 1988, 28 countries had ratified the Protocol including the United States.<sup>113</sup> These countries represent 80% of the world consumption.<sup>114</sup> There is no legal effect of the Protocol. It is more or less a duty of each country that ratified the Protocol. A country may withdraw from the Protocol after four years from assuming its obligations made under it.<sup>115</sup>

## 2. Federal Regulation — EPA

The EPA enacted a reporting regulation on 12/14/87.<sup>116</sup> The regulation required that parties who import, export or produce the chemicals outlined in the Montreal Protocol report these activities at 1986 levels.<sup>117</sup> The parties had 30 days to comply with the rule or be subject to a \$25,000 fine per day.<sup>118</sup> The authority for this came under the 1982 amendments to the Clean Air Act.<sup>119</sup> The regulation was just a restatement of the requirements of the Montreal Protocol.

In December, 1987, the EPA also came out with its proposed rule which would incorporate the freeze and cuts outlined in the Montreal Protocol.<sup>120</sup> It is interesting to note the EPA's position. If the United States had not ratified this Protocol, the proposed rule would not take effect. The proposed rule's authority was based on Section 157 of the 1982 amended Clean Air Act.<sup>121</sup> The authority was to: "issue regulations for the control of any substance, practice, process or activity (or any combination thereof) which in his judgement, [the EPA Administrator] may reasonably be anticipated to effect the stratosphere, especially ozone in the stratosphere, if such effect in the stratosphere may reasonably be anticipated to endanger public health or welfare."<sup>122</sup> The language of the 1982 amendments to the Clean Air Act does not differ significantly from the language in the 1977 amendments. Again, the question must be raised why was world pressure necessary for the EPA to promulgate regulations.

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112. *Id.* at 21.

113. Press release from Dr. Noel J. Brown, Director of United Nations Environment Programme (Jan. 6, 1989).

114. *Id.*

115. *Protocol*, *supra* note 96, at 22.

116. Protection of Stratosphere Ozone, Final Rule, 52 Fed. Reg. 47,486 (1987) [hereinafter E.P.A. Final Reporting Rule, 1987].

117. *Id.*

118. *Id.* at 47,487.

119. *Id.*

120. E.P.A. Proposed Rule, 1987, *supra* note 32, at 47,489.

121. *Id.* at 47,491.

122. *Id.*

The proposed rule contained much information regarding risk assessment. The logic behind the EPA's not proposing further cuts is explained in the proposed rule. Data presented showed if the United States alone would cut its CFC consumption by 80% (the proposal was 50%), ozone depletion would only be reduced 0.1%.<sup>123</sup> The ozone depletion was assumed to be only 2% by 2075 if the Montreal Protocol was followed.<sup>124</sup> The EPA used an additional argument; if the United States cuts went beyond the Montreal Protocol, other countries would not have the incentive to join.<sup>125</sup> These arguments were far from convincing after the Ozone Trends Panel came out with its report of ozone depletion already at 3% in the Northern Hemisphere and 5% depletion in the Southern Hemisphere.

In August, 1988, the EPA promulgated its final rule.<sup>126</sup> By this time the EPA had five months to digest the Ozone Trends Panel report. The EPA fully realized that the previous estimates of ozone depletion were very much understated. Yet, with all of this information the EPA refused to go beyond the Montreal Protocol limits. Its answer for the Antarctic hole was; too many questions remain for it to take it into account. As to the figures concerning already occurring ozone depletion, the EPA disclosed an article that said ozone had not depleted. The EPA further rationalized the high depletion figures by stating: "Depletion occurring in the areas analyzed does not mean global depletion."<sup>127</sup> It also suggested that the agency did not have adequate time to review the Ozone Trend Panels report. Finally, the EPA interpreted the 1982 amendments to the Clean Air Act as only requiring actual endangerment of public health.<sup>128</sup>

What the EPA neglected to do is leave in the words "reasonably be anticipated" from its interpretation of the congressional intent of its rule making authority. Without this language the EPA may be correct. With the language, surely a panel consisting of hundreds of scientists worldwide, plus direct measurements of ozone depletion is enough to warrant anticipation of human health endangerment.<sup>129</sup> The EPA used its antiquated, over a decade old atmosphere 1D model, which shows that depletion will occur to the extent of 1% by the year 2000 if no controls are in place and up to 50% by the year 2075.<sup>130</sup> In the EPA's risk assess-

123. *Id.* at 47,499.

124. *Id.*

125. *Id.*

126. Protection of Stratospheric Ozone Final Rule, 53 Fed. Reg. 30566 (1988) [hereinafter EPA Final Protocol Rule, 1988].

127. *Id.*

128. *Id.*

129. The Ozone Trends Panel's finding indicated ozone depletion at higher than anticipated levels.

130. E.P.A. Final Protocol Rule, 1988, *supra* note 126, at 30,573.



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ment, using the atmospheric models, ozone depletion following the Montreal Protocol would amount to 1.9% by the year 2075.<sup>131</sup> The final result is the EPA followed the Montreal Protocol to the letter.

The same day it issued the final rule adopting the Montreal Protocol, the EPA also issued Advanced Notice of Proposed Rule Making.<sup>132</sup> Its stated purpose was to discuss the Ozone Trends Panel report and its willingness to review the data and publish its findings.<sup>133</sup> In addition, it requested the legal community to give it feedback on the following first impression type situation: the EPA proposed to charge a fee on the manufacturers of CFC's to preclude windfall profits. It was thought that high profits could lead to a delay in finding chemical substitutes.<sup>134</sup> The fee could be considered a tax which the Agency thought it did not have the authority to levy.

The EPA also proposed that the current system, allocation based, be changed to an auction basis.<sup>135</sup> Under current legislation, CFC's would be allocated to the 1986 users. The auction proposal would be attractive to the EPA because only those who really needed the CFC's would bid on them. The excess dollars from the auction would then go directly to the U.S. Treasury to be used for substitute research and other means of reducing CFC's.<sup>136</sup>

The EPA responded to comments regarding its proposal of direct controls for CFC's users. The agency believed that direct controls would be the catalyst for quicker substitutes of CFC's.<sup>137</sup> Controls on the users would force them to procure CFC substitutes, or even develop different manufacturing techniques. Finally the EPA responded to comments concerning the labelling of all products containing CFC's or manufactured with CFC's. The agency believed that labelling would put pressure by the consumer on the manufacturer to choose alternatives.<sup>138</sup>

At this time the EPA has not yet adopted any of the proposals it made under the Advance Notice, i.e.: fees, auctions, labelling or direct controls. With pressure mounting from the media, other countries and lobbying groups, it seems likely that these proposals will turn into

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131. *Id.* at 30,575.

132. Protection of Stratospheric Ozone; Advance Notice of Proposed Rule Making, 53 Fed. Reg. 30,604, (1988) [hereinafter EPA Advance Notice, 1988].

133. *Id.* at 30,605.

134. *Id.* at 30,606.

135. *Id.* at 30,610.

136. *Id.*

137. *Id.* at 30,616. Some direct control ideas are: Hospital Sterilization: Forcing the use of Cold Sterilants, Use of Disposable and Contract Sterilization; Auto Air Conditioning Recycling: Forcing the use of DME 12 a lower ODP chemical; Aerosols: Using CO2 alternatives; Solvents: Use of terpene and aqueous cleaners. These are changes which are considered short range solutions which could immediately be implemented. *Id.*

138. *Id.* at 30,618.

regulations. The EPA did publicize in September, 1988 that further cuts, more than 50%, are necessary based on the Ozone Trends Panel report.

Another CFC related regulation was promulgated on February 9, 1989.<sup>139</sup> This new regulation allowed manufacturers to transfer allocations. What this does is allow producers and importers to be able to transfer their rights to produce or import CFC's. This is a grave blow to reducing CFC's. A company which manufactures CFC's could come up with a substitute and then sell off their rights to produce CFC's. Instead of reducing CFC's, this regulation actually extends the use of CFC's.

In September of 1989, the EPA established the Stratospheric Ozone Protection Advisory Committee.<sup>140</sup> The purpose of the committee is to advise on policy and technical issues that relate to the institution of the Montreal Protocol.<sup>141</sup> The committee will assist the EPA during the transition to non-ozone depleting substitutes.<sup>142</sup>

### 3. State or Local Level Regulation

There are few state laws concerning CFC regulation at this present time with the exception of aerosols. There are a number of states that have bills before committees. Proposed international, federal, and state laws will be discussed in a later section.

The City of Los Angeles, California has however, enacted an ordinance banning polystyrene (Styrofoam).<sup>143</sup> Polystyrene is made from CFC's. After July 7, 1989 it was unlawful to manufacture, sell or distribute to any person in the city a product made from or with polystyrene. The ordinance is to reduce ozone depletion and to protect wild life from eating it. The ordinance includes products packaged in polystyrene.

### 4. Manufacturers Response to the Current Legislation

Dupont is the leading manufacturer of CFC's in the United States. Out of a 750 million dollar market in the United States, Dupont has 600 million of it.<sup>144</sup> Dupont's position has changed drastically from the 1970's when it did not believe CFC's caused harm. In 1986, Dupont moderated its original position and supported the Montreal Protocol but did not support further controls.

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139. Protection of Stratospheric Ozone; Final Rule, 54 Fed. Reg. 6,376 (1989).

140. Stratospheric Ozone Protection Advisory Committee; Establishment, 54 Fed. Reg. 37,990 (1989).

141. *Id.*

142. *Id.*

143. Los Angeles, Cal., Ordinance 163918 (1988).

144. U.S.A. Today, Sept. 29, 1988, at 1, col. \_\_; Fortune, Mar. 14, 1988, at 136.

On March 24, 1988, nine days after the Ozone Trends Panels findings, Dupont dramatically changed its position again. Dupont proposed to speed up signing of the Montreal Protocol and accelerate the Protocol by further limiting CFC's.<sup>145</sup> It also stated its commitment to eliminating CFC's totally.<sup>146</sup> Apparently, the fact that Dupont's own scientists, were part of the Ozone Trends Panel, might have had an affect on its sudden radical change of position. It is radical in light of the fact that the EPA, five months later, had not come to the same conclusions as Dupont, a manufacturer.

Dupont has a number of CFC substitutes already in research and a few ready for sale. The substitutes are called HCFC's and HFC's. These products are theorized as not having a significant effect on atmospheric ozone. The HFC's have no chlorine so they can not cause an ozone depletion problem and the HCFC's have .01 ozone depletion potential.<sup>147</sup>

As far as the wind fall profits "fee", Dupont's position is that its diametrically opposed. Dupont said: "it spent 70 million in 1988 and projects to spend one billion to find substitutes."<sup>148</sup> Without these dollars it would significantly hamper its research and development activities. It expects to be able to produce some substitutes as early as 1992 to 1995 but probably cannot totally phase out production until 2000.<sup>149</sup> Not all industry segments had taken such a radical stand as Dupont. This is especially true with small businesses that manufacture products made from or with CFC's. Small businesses are expected to react the slowest in obtaining substitutes because of cost factors. The EPA proposed not to implement direct regulations on small businesses.<sup>150</sup>

## 5. Lobbying Groups Response to the Current Legislation

In 1980, a lobbying group was founded called the Alliance for Responsible CFC Policy. The organization is made up of 500 producers and users of CFC's.<sup>151</sup> The purpose of the organization was to ensure an objective review of up to date scientific information and to ensure that the EPA concentrates on regulations at an international level rather than unilateral domestic regulations.<sup>152</sup>

The Alliance supports the Montreal Protocol but is against the United States banning all CFC's. It has stated that the Antarctic hole is not a

145. Glas, Dupont's Fluorocarbons Update (July, 1988).

146. *Id.* at 6.

147. *Id.*

148. Dupont's Corporate News, Jan. 9, 1989.

149. Dupont's Corporate News, Jan. 30, 1989.

150. E.P.A. Advance Notice, 1988, *supra* note 132, at 30,616.

151. Alliance: Chlorofluorocarbons *supra* note 11, at 1.

152. Alliance for Responsible CFC Policy, The Montreal Protocol: A Briefing Book (Dec. 1987).

permanent fixture but only occurs for two months at a time.<sup>153</sup> Even if this were true what they neglected to state was the hole pulls in ozone and thus depletes total global ozone. In addition, it did not state the hole is graphically the size of the United States. They stand behind their assertion there is no global reduction in ozone.<sup>154</sup> In many publications they have highlighted the tremendous loss in our economy if CFC's are eliminated. Even with substitutes there are costs associated such as fuel loss. The Alliance has brought to light the fact that the substitutes are less energy efficient. They estimated in a 10 year period in the United States that an additional 9 to 12 billions dollars of fuel would be expended due to less efficient substitutes.<sup>155</sup> Dupont has verified that the substitutes it's developing are less energy efficient.

A final concern of the Alliance is the price spikes expected. They predict in 1990 the price will double, 1994 prices will grow by an additional 100%, and finally in 1999 prices will grow by 800%.<sup>156</sup> The 1990 price increases estimated for CFC's in the sterilant industry was accurate. The figures used are close to the estimates used by the EPA. Even if the CFC manufacturers do not have windfall profits, added costs will exist. The costs will be passed to the consumer or may close marginal businesses. In light of the severe risks associated with ozone depletion, the concerns of the Alliance are not critically important. The point the Alliance made concerning supporting international controls is well taken. If the United States alone cuts back, this still leaves other countries to manufacture and consume CFC's. This does not mean that we should not eliminate CFC's in our own country if possible.

There are a number of pro-environmental lobbying groups. Two such groups are the Environmental Policy Institute and the Institute for Energy and Environmental Research. Both of these groups supported a project which resulted in the book "Saving Our Skins".<sup>157</sup> The book is about the hazards of ozone depletion and why CFC's, halons, and other ozone depleting chemicals should be eliminated.<sup>158</sup>

These two groups propose the following: phase out of CFC's by 1995, phase out of methyl chloride and carbon tetrachloride by 2000, recycling and recovery of ozone depleting chemicals, tax on CFC's to be used for recovery systems, CFC destroying incinerators, changes in the military regulations which encourage CFC use, world-wide ban on aerosols (ex-

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153. *Id.* at iv.

154. *Id.* This premise is most likely based upon atmospheric models rather than direct measurements.

155. Alliance: Chlorofluorocarbons *supra* note 11, at 11.

156. Alliance for Responsible CFC Policy, Economic Implications of Potential Chlorofluorocarbon Restrictions, Final Report (1987).

157. Makhijani, *supra* note 1.

158. *Id.*

cept in medical uses), studies on chlorinated hydrocarbon alternatives by the EPA and the UNEP, intensify international cooperations and research, assistance to third world countries on CFC phase out, complete fulfillment and extension of the Montreal Protocol, and firm regulations of corporations.<sup>159</sup>

This comprehensive phase out and all other steps are also supported by another pro-environmental group called the National Resources Defense Council (NRDC).<sup>160</sup> An additional proposal, other than those the Environmental Policy Institute suggested, is the council's support for a labeling requirement.<sup>161</sup>

The NRDC is a strong advocate of the environment. Its Senior Attorney, D. Doniger, attacked the EPA's September, 1988 comments regarding CFC's. He argued that EPA's Administrator, as per the regulations, must enact stronger CFC controls now. The EPA stated in its September comments that ozone depletion is a much higher level than was projected. By those comments it is required under Sect. 157 of the Clean Air Act to institute further controls on domestic production.<sup>162</sup>

In additional, the NRDC stated its position regarding the imposition of a regulatory fee. It cited a case directly on point which could be used to argue the EPA had jurisdiction to impose the fee on CFC manufacturers.<sup>163</sup>

The NRDC strongly urged direct control on users should be adopted immediately.<sup>164</sup> It agreed with the EPA that unless direct controls are implemented the price of CFC's increasing alone will not cause users to switch to substitutes.<sup>165</sup> One measure that has not been mentioned by anyone is public awareness. People may realize there is a problem but yet no programs are in place to make people aware that discharges of CFC's are harmful to the environment.

### C. *Proposed Legislation*

#### 1. International

The United Nations Environmental Programme when it proposed the

159. *Id.* at 16-20. The institute wants these goals because as they put it: "The costs of phasing out CFC's would probably be several billion dollars per year worldwide. The cost of not taking those actions are literally incalculable. We speak here of saving our very skins." *Id.* at 17.

160. D. Doniger, Comments of the National Resources Defense Council on the Environmental Protection Agency's Advance Notice of Proposed Rule Making Regarding Production and Consumption of Chlorofluorocarbons, Halons, and Other Ozone-Depleting Substances, (1988) [hereinafter Comments].

161. *Id.* at 3.

162. *Id.* at 12.

163. *Federal Energy Admin. v. Algonquin SNG, Inc.*, 426 U.S. 548 (1976). The court upheld an oil importation fee by the Federal Energy Administration. *Id.*

164. Comments, *supra* note 160, at 12.

165. *Id.* at 24.

Montreal Protocol did not have the benefit of the Ozone Trends Panel information. As a result, the Protocol is not effective for its intended purpose of protecting mankind. Because of this, UNEP will discuss possible amendments to the Protocol.<sup>166</sup> The amendments are predicted to be on the order of an 85% cut by 1998.<sup>167</sup> On March 7, 1989 a conference was held in the United Kingdom with the United States and other European nations. The 120 nation conference called for a ban on all CFC's by 2000.<sup>168</sup> The United States was represented by Senator Gore and the EPA Administrator, William Reilly. The United States supported the ban but there was not formal treaty proceedings.

## 2. Environmental Protection Agency

The EPA has not yet enacted any more regulations concerning further reduction in ozone depleting chemicals. The NRDC was planning to sue the EPA for not promulgating stronger regulations.<sup>169</sup> With the pending suit and world pressure, it is highly likely that the EPA will come out with stronger regulations soon. In August, 1989, the EPA considered adding Trichloroethane to its list of CFC's to be eliminated if the parties to the Montreal Protocol agree.<sup>170</sup> Trichloroethane is used extensively as a solvent for metal cleaning.

## 3. Legislative Level

A bill, H.R. 503, was before the Committee on Energy and Commerce in the House of Representatives. The bill called for the following labeling: "This product [contains or was produced with or was produced from] chlorofluorocarbon which destroys the Earth's protective ozone layer. Destroying the ozone layer increases the risk of death by skin cancer and disrupts natural systems, including food production."<sup>171</sup> The authority for the labelling would come under the Consumer Product Safety Commission.<sup>172</sup> The bill is not without substance. There would have been severe fines for violations. Virtually thousands, maybe millions of products would have been affected because of its requirements of labeling any product made from, with or containing CFC's. If a computer part was cleaned in Freon, the entire finished computer would have to be labelled. All sterile disposable products would have to be labelled be-

166. Press Release From Diane Brady, United Nations Environmental Programme (Jan. 1989).

167. *Id.* at 5.

168. U.S.A. Today, Mar. 7, 1989, at 1.

169. Telephone interview with Mary Ketcham Colwell, Attorney for the E.P.A. in Washington, D.C. (Feb. 8, 1989).

170. Testing Consent Order for 1,1,1, Trichloroethane and Response to the Interagency Testing Committee, 54 Fed. Reg. 34,991 (1989) (to be codified at 40 C.F.R. pt. 799).

171. H.R. 503, 101st Cong., 1st Sess. (1989).

172. *Id.* at 2.

cause they are packaged in Tyvek which was manufactured with CFC's. The bill is still in Committee.

On January 25th of 1989 another bill, S. 201, the World Environmental Policy Act of 1989, was before the Committee on Environment and Public Works. This bill was sponsored by Senator Gore of Tennessee. The bill was designed "to respond to the global environmental degradation brought on by human activities by reviewing the trends that are potentially altering or destroying vast portions of the biosphere, and to ensure that the United States policies provide for the protection of the world environment from future degradation and for other purposes."<sup>173</sup> The bill states that we in the United States can no longer look at our own backyards regarding the environment. Title III, Regulations and Phase Out of Arthoropogenic Emissions that Degrade the Environment, deals with the regulation of ozone depleting substances. The following production cuts were proposed: 1991 - 25%; 1992 - 50%; 1994 - 95%; 1996, it would be unlawful to manufacture or release CFC 111, 112, 113, Halon 1211, Halon 1301 and carbon tetrachloride; 2000, no production or release of CFC 22, 114, 115 and methyl chloride.<sup>174</sup> Not only did the bill add carbon tetrachloride and methyl chloride but this bill required the control of *release* of these chemicals.

In addition, disposal must be 99.999% effective.<sup>175</sup> Another section would have prohibited the venting of these chemicals to the air.<sup>176</sup> Products containing CFC's such as soft foam and styrofoam would have to be incinerated by a 99.999% effective means.<sup>177</sup>

The bill contained similar labeling requirements as H.R. 503. After 1995 and 2000, depending on the ozone depleting substance, the use of it would be prohibited. The bill is certainly stronger than the Montreal Protocol. It has incorporated all of the suggestions from the pro-environmental lobbying groups plus some. The only exemptions under this bill would be medical products or national security reasons. The FDA would determine which medical products would be exempted. Based on the small number of products the FDA exempted in the 1978 aerosol ban, it is unlikely they would have given many exceptions.

As of November, 1989, eleven months from the date S.201 was given to committee, this bill has yet to be passed in any form. The bill was first broken down to its nine titles and separate bills were made.<sup>178</sup> Title III governing CFC's was broken into three bills S.870, a labelling bill; S.871

173. S. 201, *supra* note 13, at 1.

174. *Id.* at 24-29.

175. *Id.* at 36.

176. *Id.*

177. *Id.* at 37.

178. Telephone interview with David Brief, Senator Gore's staff in Washington, D.C. (October 5, 1989).

a tax on users and manufacturers of CFC's; and S.872 the phase out of CFC's.<sup>179</sup> The three bills are not being dealt with. Separate sections have been taken out and combined with other bills by the Committee on Environment and Public Works.<sup>180</sup> Sections of the tax bill were in the Committee on Budget Reconciliation at the time of this article.<sup>181</sup>

Senator Gore's bill was a land mark accomplishment in its recognition of the world environment. It is unknown what portions will survive this consolidation process. The real tragedy is that it takes so long to enact legislation for the protection of this planet.

As strict as S.201 originally was, ozone depletion would continue to some extent. The EPA theorized that with 100% cuts world-wide by the year 1998, that future concentrations of atmospheric chlorine would increase by 0.8ppbv.<sup>182</sup>

#### 4. State Level

A number of states have proposed bans on either CFC's, styrofoam, or both. Missouri has banned styrofoam products and packaging in the state.<sup>183</sup> Rhode Island has proposed to ban the purchase, manufacture, or obtaining any CFC 11 or 12, and CFC 11 or 12 processed product.<sup>184</sup> There is an exemption clause if the members of the State Environmental Commission determines that there are no acceptable non-CFC processed equivalents. This particular law has severe ramifications for the medical device industry which uses sterilants containing CFC 12 extensively. It appears that Rhode Island realizes that there are alternative ways to sterilize, as so many lobbying groups have stated, and are doing something about it. California has also proposed a law requiring no venting of CFC's in the air and mandatory recycling of CFC's.<sup>185</sup> As of February, 1989, North Carolina did not intend to do anything more than the EPA required.<sup>186</sup> At that time, North Carolina was under the Harrison amendment which restricted legislation only to the extent of the EPA's regulation and no more.<sup>187</sup> The Harrison amendment was rescinded later in 1989. Since that time, there was one bill relating to the prohibition of packaging made from CFC's. It was similar to the Missouri bill

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179. *Id.*

180. *Id.*

181. *Id.*

182. Hoffman, *supra* note 35, at 3.

183. H.R. 96, 85th Gen. Assembly, (1988).

184. 88-S 2727, Jan. Sess., Gen. Assembly (1988).

185. S. 116 (1988).

186. Telephone interview with the General Assembly's Bill Status Information Clerk (Feb. 1989).

187. N.C. Gen. Stat. § 143-215(7) (1988). "[T]he Commission shall adopt no standard which is not based upon approved State programs by rules, regulations or published guidelines of the United States Environmental Protective Agency or the Federal Clean Air." *Id.*



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that banned packaging made from CFC's.<sup>188</sup> The bill did not make it to the General Assembly to become law.<sup>189</sup>

Connecticut has been the most active state regarding CFC proposed laws. It had before the Committee on Environment seven proposed bills: Bill no. 5040 bans CFC in non-propellant use; bill no. 5606 bans styrofoam food containers; bill no. 5630 bans styrofoam products or products containing styrofoam; bill no. 5631 establishes a program to reduce CFC's in hospital sterilization; bill no. 5632 requires the licensing of persons repairing or installing auto air conditioners; bill no. 5637 CFC recycling is to be considered in the solid waste recycling program; and finally bill no. 5634 is a pilot program for the state to purchase helium based refrigerators.<sup>190</sup>

These proposed laws are within the state's authority under the federal Clean Air Act. The states are allowed to promulgate rules more restrictive than the EPA. These proposed laws are far more restrictive than the EPA's current regulations. The state laws will be particularly hard on manufacturers who may not be aware of local legislation. Manufacturers will have to review all state laws prior to distribution of their products. There needs to be uniform federal laws or regulations governing the areas that the states are proposing to govern. Twenty-five cities are considering legislation banning CFC's or requiring recovery when CFC's have to be used.<sup>191</sup>

## VII. CONCLUSION

The question proposed at the beginning of this comment was whether current or proposed legislation on CFC's manufacture and usage is sufficient to eliminate the harms to the environment. Certainly, the current legislation is not enough. It was shown by the atmospheric models that chlorine would increase to 6 to 8 ppbv.

The next part of the question was if proposed legislation is enough? It is not enough to halt the harms already in process. Chlorine is targeted to grow by 0.8 ppbv with 100% cuts by 1998. In addition, 20% of other countries using CFC's are not parties to the Montreal Protocol. This does not even take into account the other third world countries that may use CFC's someday.

Further, the chemicals themselves have extensive lifetimes, as much as 380 years. Also, there are millions of tons of CFC's trapped in products such as foams, refrigerators and cars. Even the incineration require-

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188. Telephone interview with the General Assembly's Bill Status Information Clerk (Oct. 1989). H.B. 619, 139th Gen. Assembly (1989). *Id.*

189. *Id.*

190. H.R. 5040, 5606, 5630, 5631, 5632, 5633, 5634, Jan. Sess. Gen. Assembly, (1989).

191. Devices and Diagnostic Newsletter, Sept. 1, 1989, at 2.

ments such as S.201 proposed could not totally halt more damage to the ozone layer. It did provide the best chance at reducing the harms from CFC's. Now, it is unknown as to what part of the bill's contents will survive.

The problem, is that even if all countries in the world stopped today all CFC products manufacture and use, plus all countries used 99.999% incineration techniques, it still takes 6 to 8 years for 63% of CFC's to reach the stratosphere to cause damage. The answer to the question is that the proposed legislation is not enough.

There has been significant damage to the earth's environment such as Antarctic hole, the potential Arctic hole and depletion in global ozone. Hopefully, more restrictive laws will be passed in other countries and domestically to stem the tide of unknown damage to the earth's environment.

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