

# **ASPIRATION AND REALITY IN TAIWAN, HONG KONG, SOUTH KOREA, AND SINGAPORE: AN INTRODUCTION TO THE ENVIRONMENTAL REGULATORY SYSTEMS OF ASIA'S FOUR NEW DRAGONS**

## **I. INTRODUCTION**

In 1970 the United States observed the first "Earth Day" for the purpose of raising the environmental consciousness of the nation and eventually, the world.<sup>1</sup> Although the United States has a wealth of environmental problems,<sup>2</sup> they pale in comparison to those found in developing countries, which are often plagued by limited land area and raw materials, burgeoning industries, and frequently, external pressures that siphon needed resources.<sup>3</sup> The development efforts of

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1. Earth Day has been celebrated in late April every year since 1970. Henry P. Caulfield, *The Conservation and Environmental Movements: An Historical Analysis*, in ENVIRONMENTAL POLITICS AND POLICY: THEORIES AND EVIDENCE 13, 39 (James P. Lester ed., 1992).

2. See AL GORE, EARTH IN THE BALANCE: ECOLOGY AND THE HUMAN SPIRIT *passim* (1992).

3. Of particular interest in this Note are Asia's four new Dragons and how they have handled the environmental issues that have arisen in the last several decades. Much of the groundwork for the Dragons' current environmental woes lies in their turbulent social and economic histories. Now one of the more prosperous Asian nations, South Korea began the rebuilding and regrowth that laid the foundation for its present economic success following the signing of the Korean Armistice on June 27, 1953. That regrowth, however, was encumbered by tangible and intangible threats originating in North Korea and targeting South Korea's social, military, and economic strength. See KOREA: PAST AND PRESENT 139-52 (Kwangmyong Publishing Co., 1972); see also EZRA F. VOGEL, THE FOUR LITTLE DRAGONS: THE SPREAD OF INDUSTRIALIZATION IN EAST ASIA 42-65 (1991). The threat of invasion also hindered others' hopes for prosperity. After its retreat to Taiwan in 1949, the anti-communist military efforts of the Government of the Republic of China were consuming 85 percent of total expenditures. See THOMAS B. GOLD, STATE AND SOCIETY IN THE TAIWAN MIRACLE 69 (1986).

Hong Kong, another of the four Dragons, has realized its economic miracles in the shadow of its future leaseholder, the neighboring People's Republic of China (P.R.C.). In the 1960s, concurrent with the Cultural Revolution within the P.R.C., protests and riots wreaked havoc on the colony's development. See BRIAN KELLY & MARK LONDON, THE FOUR LITTLE DRAGONS 266-67 (1989). The 1985 Joint Declaration of the Chinese and British Governments, which recognized Hong Kong's return to the P.R.C. in 1997 as a Special Administrative Region,

the Republic of China on Taiwan (Taiwan),<sup>4</sup> Hong Kong, South Korea,<sup>5</sup> and Singapore are illustrative of the pitfalls and tradeoffs awaiting developing nations as they attempt to nurture a growing economy without poisoning the environment.

Taiwan, Hong Kong, South Korea, and Singapore are referred to as the "Four Little Dragons"<sup>6</sup> due to their high rate of economic vigor and growth. Hong Kong's gross national product (GNP) rose from less than U.S. \$3 billion in 1958 to U.S. \$55 billion in 1988;<sup>7</sup> Singapore's 1992 per capita GNP was more than U.S. \$15,000;<sup>8</sup> and South Korea's per capita income is higher than that of Argentina,

reaffirmed the tenuous future of the colony's quintessentially capitalist economy. See Richard Louis Edmonds, *The Changing Geography of Taiwan, Hong Kong and Macau*, in *THE CHANGING GEOGRAPHY OF ASIA* 160, 183 (Graham P. Chapman & Kathleen M. Baker eds., 1992). The instability associated with Hong Kong's fight to develop as a capitalist state while at the doorstep of Asia's communist giant, the P.R.C., combined with the Hong Kong government's attenuated control over the island, does not provide fertile ground for the growth of a far-sighted environmental protection policy. *Id.* at 180. Single-minded economic development appeared to be the best means to reap the greatest reward from what could be a short-lived enterprise. See Pang Eng Fong, *The Distinctive Features of Two City-States' Development: Hong Kong and Singapore*, in *IN SEARCH OF AN EAST ASIAN DEVELOPMENT MODEL* 220, 225 (Peter L. Berger & Hsin-Huang Michael Hsiao eds., 1988).

Perhaps it was Singapore's relative freedom from such express external pressures that afforded it the luxury of continuously increasing economic and environmental development. Singapore promoted cautious but amicable relations with Malaysia after establishing its independence from that state. See VOGEL, *supra*, at 75. The government's decision to emphasize social reform along with economic development enabled Singapore to achieve an industrial and developmental permanence lacking in the other Dragons. See Pang Eng Fong, *supra*, at 225-26, 232; but see *Arms Trade: Russia Muscles In*, *THE ECONOMIST*, July 17-23, 1993, at 33, 34 (showing a U.S. \$2.1 billion increase in defense spending by Singapore between the years 1987 and 1992).

4. The government of the Republic of China has regarded Taipei, Taiwan, as its temporary seat since its move there on December 9, 1949, after successive military setbacks at the hands of Mao Tse-tung's People's Liberation Army. See GOLD, *supra* note 3, at 53.

5. The separation between the Republic of Korea (South Korea) and the Democratic People's Republic of Korea (North Korea) was completed in 1948 with the establishment of "an independent government under U.N. auspices . . . only in the southern half of the country." KI-BAIK LEE, *A NEW HISTORY OF KOREA* 378 (Edward W. Wagner & Edward J. Shultz trans., 1984).

6. The phrase "Little Dragons" was penned by the Pulitzer Prize-winning author Theodore H. White in 1985. See Theodore H. White, *The Danger From Japan*, *N.Y. TIMES*, July 28, 1985, § 6 (Magazine), at 18, 38. A great deal has been written concerning the four Dragons' phenomenal development. For example, see WALDEN F. BELLO, *DRAGONS IN DISTRESS: ASIA'S MIRACLE ECONOMIES IN CRISIS* (1990); GERALD E. CAIDEN & BUN WOONG KIM, *A DRAGON'S PROGRESS: DEVELOPMENT ADMINISTRATION IN KOREA* (1990); STEVEN M. GOLDSTEIN, *MINI-DRAGONS: FRAGILE ECONOMIC MIRACLES IN THE PACIFIC* (1991).

7. FRANK GIBNEY, *THE PACIFIC CENTURY: AMERICA AND ASIA IN A CHANGING WORLD* 232 (1992).

8. *Id.*

Mexico, or Brazil.<sup>9</sup> Similarly, Taiwan's GNP has nearly tripled in the last decade and now is almost equal to the level reached by the United States fifteen years ago.<sup>10</sup> In general, "[t]he four [little Dragons] . . . have growth rates which, at between eight and eleven percent, are more than double those for most of the rest of the world."<sup>11</sup>

This developmental success, however, was not achieved without producing a strain on the environment. Most of the rivers in Taiwan's metropolitan areas are "biologically dead,"<sup>12</sup> and the country holds approximately 283 motor vehicles per square kilometer, compared to only 19 motor vehicles per square kilometer in the United States.<sup>13</sup> In South Korea, "only 31% of sewage [is] treated before it is dumped into waterways [leaving] many of the rivers and streams that run through cities and industrial estates effectively dead."<sup>14</sup>

Each of the Dragons has attempted, with varying degrees of success, to stem the negative effects of rapid economic growth. Taiwan's environmental movement dates back to the early 1980s, when a gradual relaxation in the strict controls against public demonstrations enabled residents to voice concerns over their health and general welfare.<sup>15</sup> The efforts of both concerned members of the populace and the Environmental Protection Administration,<sup>16</sup> however, have been frustrated by a development-driven political

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9. *Id.*

10. John T. McDermott, *Introduction* to LEGAL ASPECTS OF INVESTMENT AND TRADE WITH THE REPUBLIC OF CHINA 1, 2 (John T. McDermott ed., Univ. of Maryland School of Law Occasional Papers/Reprints Series in Contemporary Asian Studies No. 1, 1991).

11. SIMON WINCHESTER, *PACIFIC RISING: THE EMERGENCE OF A NEW WORLD CULTURE* 28 (1992).

12. Yang-sun Chou, *Social Movements and the Party-State in Taiwan: Emerging Civil Society and the Evolving State Corporatist Structures* 177 (1988) (unpublished Ph.D. dissertation, Columbia University).

13. Paul J. Carroll, *Taiwan: The World's Largest Market for Major Projects*, BUS. AM., July 29, 1991, available in LEXIS, ASIAPC Library, ALLASI File.

14. See Mark Clifford, *South Korea: Wealth can Damage Health*, FAR E. ECON. REV., Sept. 19, 1991, at 43.

15. Yang-sun Chou, *supra* note 12, at 175.

16. "In January 1982 the then Department of Environmental Sanitation within the Health Administration was transformed into the Bureau of Environmental Protection, Health Administration." DENNIS TE-CHUNG TANG, *ON THE FEASIBILITY OF ECONOMIC INCENTIVES IN TAIWAN'S ENVIRONMENTAL REGULATIONS: LESSONS FROM THE AMERICAN EXPERIENCE* 322 (Academia Sinica, Institute of American Culture, 1990). The Bureau was later renamed the (Taiwan) Environmental Protection Administration. *Id.* at 323.

environment. Although many "green"<sup>17</sup> organizations exist in Hong Kong,<sup>18</sup> environmental activism is in its infancy, and economic development continues to outweigh environmental concerns when the two conflict.<sup>19</sup> Despite South Korea's enactment of the Environmental Preservation Act in 1977<sup>20</sup> and the establishment of the Environmental Protection Agency in 1980,<sup>21</sup> environmental protection legislation has always had to compete with the long-standing national priority given to industrial development.<sup>22</sup> Singapore, however, is often considered a model of how developing countries could deal with environmental concerns.<sup>23</sup> In 1970 it formulated an ambitious environmental policy,<sup>24</sup> including the establishment of an Anti-Pollution Unit under the direction of the Prime Minister's office.

Taiwan, Hong Kong, South Korea, and Singapore are the incumbent economic leaders of developing Asia. In order to further that role and secure their future, the four Dragons must reconcile aggressive economic performance goals with far-sighted environmental protection regimes. This Note examines the evolution of the environmental regulatory systems of the four Dragons and surveys their respective environmental accomplishments.<sup>25</sup> Parts II through V focus respectively on Taiwan, Hong Kong, South Korea, and

17. "Green" is generally synonymous with "environmentally sound" or "pro-environment." See IRENE FRANCK & DAVID BROWNSTONE, *THE GREEN ENCYCLOPEDIA* 153-54 (1992).

18. At least seven such organizations currently exist. Telephone Interview with Bonnie Chan, LL.B. Hong Kong University Law School 1991, P.C.L.L. Hong Kong University Law School 1992, LL.M. Harvard University Law School 1993 (Jan. 4, 1993).

19. As recently as October 1992, developmental pressures in Hong Kong resulted in land reclamation projects that were undertaken despite the explicit warnings of the Environmental Protection Department. See Jonathan Karp, *Passing the Muck: Asia Starts to Confront Environmental Degradation*, FAR E. ECON. REV., Oct. 29, 1992, at 32. One of these projects "created an embayment that could not be flushed by natural currents, and fish were deprived of oxygen in the sewage-clogged water." *Id.*

20. Yeon-Chang Koo, *Legal Aspects of Environmental Protection in Korea*, 7 KOREAN J. COMP. L. 1, 6 (1979).

21. *Id.*

22. See *id.* at 5.

23. Brian C. Smith, Note, *Singapore: A Model of Urban Environmentalism in Southeast Asia*, 16 HASTINGS INT'L & COMP. L. REV. 123, 123 (1992).

24. See Peter S.J. Chen, *Development and Environmental Planning in Singapore*, in ENVIRONMENTAL LAW AND POLICY IN THE PACIFIC BASIN AREA 23, 24 (Ichiro Kato et al. eds., Univ. of Tokyo Press 1981).

25. Throughout this Note, the author examines and explains the backgrounds of the four Dragons and their environmental regulatory systems. The goal of this Note, however, is not specifically comparative. For those interested in broader comparisons involving the varied legal systems received or adopted into the jurisprudence of the four Dragons, see RENÉ DAVID & JOHN E.C. BRIERLEY, *MAJOR LEGAL SYSTEMS IN THE WORLD TODAY* *passim* (3d ed. 1985).

Singapore. Each part will examine the historical, political, cultural, and other forces that have influenced that Dragon's current environmental policies. In addition, each part provides an overview of the environmental regulatory system and organs of that Dragon, discusses the influence of nongovernmental environmental organizations and popular environmental movements, and notes the genesis of environmental technology (envirotech) opportunities. An outline of current environmental laws for each Dragon is also included. Finally, Part VI looks to the future of environmental protection in Asia based on the experience of the four Dragons as harbingers of reform.

## II. TAIWAN

### A. History

Present-day Taiwan marks its history from 1949,<sup>26</sup> when the Nationalist Government, headed by Chiang K'ai-shek, retreated to the island after civil war defeats at the hands of the Communists in the cities of Tientsin and Peking.<sup>27</sup> In a little more than four decades, the Nationalist Government has transformed the originally agrarian economy of the often dispossessed island.<sup>28</sup> Its labor- and capital-intensive policies created an industrial juggernaut that has "amassed the second largest foreign reserves in the world, 74 billion dollars in 1989, and is currently the largest importer of gold."<sup>29</sup> These feats were accomplished by political and legal systems that were previously characterized by centralized control and a repressive administration,<sup>30</sup> precipitated largely by the animosity existing between the Nationalist and Communist governments on either side

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26. The Nationalist Government on Taiwan, however, marks its age from the establishment of the Republic of China on the mainland in 1911. See SOURCES OF CHINESE TRADITION 98 (Wm. Theodore de Bary ed., 1960).

27. John K. Fairbank et al., *The Triumph of Communism, in CHINA: READINGS ON THE MIDDLE KINGDOM* 207, 209 (Leon Hellerman & Alan L. Stein eds., 1971). The governments of Taiwan and the P.R.C. maintain that the island is not an independent state, but that it is a province of China. See Chen Tung-Pi, *Bridge Across the Formosa Strait: Private Law Relations Between Taiwan and Mainland China*, 4 J. CHINESE L. 101, 101 (1990).

28. For a detailed account of the successive economic policies of Taiwan, see Michael Scott Feeley, *Reclaiming the Beautiful Island: Taiwan's Emerging Environmental Regulation*, 27 SAN DIEGO L. REV. 907, 909-14 (1990); see also Rong-I Wu, *The Distinctive Features of Taiwan's Development*, in IN SEARCH OF AN EAST ASIAN DEVELOPMENT MODEL, *supra* note 3, at 179-96.

29. Feeley, *supra* note 28, at 912 (footnote omitted).

30. See TE-CHUNG TANG, *supra* note 16, at 298-310; see also GOLD, *supra* note 3, at 59-64, 72-73.

of the Taiwan Strait.<sup>31</sup> Nonetheless, political and legal reform swept over the island as recently as the last decade,<sup>32</sup> aided by former President Chiang Ching-kuo's decision to end thirty-five years of martial law in 1987.<sup>33</sup> These changes were hastened by Chiang Ching-kuo's tolerance of opposition party candidates in the 1986 local elections.<sup>34</sup>

Taiwan's historical and political changes have been bolstered by a gargantuan bureaucracy<sup>35</sup> and a transplanted, hierarchical governmental and legal system based on the teachings of Dr. Sun Yat-sen<sup>36</sup> but resembling earlier, Western civil legal traditions.<sup>37</sup> The fundamental laws of Taiwan are rooted in the continental European systems, principally German and Swiss law.<sup>38</sup>

Taiwan has successfully used political and economic flexibility and direct legal control despite many problems, the greatest of which lies in the great variety of peoples<sup>39</sup> of different religions<sup>40</sup> who

31. For a discussion of the historical and legal relationship between Taiwan and the P.R.C., see Chen Tung-Pi, *supra* note 27, at 101-25.

32. See generally Yeh Jiunn-Rong, *Changing Forces of Constitutional and Regulatory Reform in Taiwan*, 4 J. CHINESE L. 83, 83-100 (1990) (analyzing the present status of regulatory reform efforts and suggesting ways "to direct Taiwan's regulatory reform toward meaningful participatory democracy").

33. See GIBNEY, *supra* note 7, at 358. This greater tolerance shown toward freedom of expression has been a major contributor to agitation and protests aimed at gaining greater citizen representation in the government, environmental protection, etc. See generally BOYE DE MENTE, CHINESE ETIQUETTE & ETHICS IN BUSINESS 200, 201 (1989) (describing the effect of such agitation upon the Taiwanese business climate).

34. See GIBNEY, *supra* note 7, at 358. Chiang Ching-kuo was especially tolerant of candidates of the Democratic Progressive Party (D.P.P.). The efforts of the D.P.P. have resulted in marked increases in native Taiwanese participation in a formerly mainland/Nationalist-controlled government. *Id.* at 358-59.

35. See GOLD, *supra* note 3, at 64.

36. Dr. Sun Yat-sen (1866-1925) is the founding father of the Republic of China and of the Nationalist Party. His teachings, which form the foundation for Taiwan's Constitution, are usually translated as the "Three Principles of the People" [San Min Chu I]. See TE-CHUNG TANG, *supra* note 16, at 242-43 n.731.

37. See generally Herbert H.P. Ma, *General Features of the Law and Legal System of the Republic of China*, in TRADE AND INVESTMENT IN TAIWAN: THE LEGAL AND ECONOMIC ENVIRONMENT IN THE REPUBLIC OF CHINA 1, 1-51 (Herbert H.P. Ma ed., Academia Sinica, Institute of American Culture, 2d ed. 1985). For example, Taiwan, a civil law state, does not follow the doctrine of *res judicata*. *Id.* Thus, lower courts on Taiwan are not bound by the decisions of higher courts. *Id.* "[D]ecisions of the court of last resort, [however] have always been accorded authority." *Id.*

38. *Id.* at 11.

39. "The population of Taiwan can be divided into three major groupings: the Taiwan aborigines or Kaoshan, the Taiwanese, and the mainlanders. . . . The mainland group is composed of people who moved to Taiwan from the mainland in the late 1940s, their descendants, and others who subsequently arrived from mainland China." Edmonds, *supra* note

must coexist on a mountainous island only about one-fourth of which is arable.<sup>41</sup> The rapidity with which the island overcame its economic backwardness was achieved largely at the expense of the environment.<sup>42</sup> As such economic feats necessarily entail the destruction of Taiwan's limited biosphere, its continuing leadership role in Asia will be decided by its ability to reform and redirect this new obstacle to development.

## B. Regulatory Authorities

The "localization" of Taiwan's environmental control contrasts with its reluctance to part from the vertically oriented, hierarchical national government that existed on mainland China before the establishment of the People's Republic of China (P.R.C.).<sup>43</sup> Thus, the Taiwanese Government reflects the characteristics of both a national and a provincial government.<sup>44</sup> At the national level, the main environmental administrative unit is the central Environmental Protection Administration (EPA), organized under the Executive Branch.<sup>45</sup> The EPA supervises and receives support from its eight specialized bureaus: the Bureau of Comprehensive Planning, the Bureau of Air Quality Protection and Noise Control, the Bureau of Water Quality Protection, the Bureau of Solid Waste Control, the Bureau of Environmental Sanitation and Toxic Substances Control, the Bureau of Performance, Evaluation and Dispute Settlement, the Bureau of Environmental Monitoring and Data Processing, and the Refuse-Driven Resource Reclamation Plant Engineering Bureau.<sup>46</sup>

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3, at 170.

40. The religions of Taiwan "are essentially the same as that found amongst Chinese communities elsewhere. . . . Confucian values and Buddhism, [Taoism], ancestor worship and Christianity [are] blended to varying degrees." *Id.* at 169.

41. TE-CHUNG TANG, *supra* note 16, at 279.

42. In their account of the Taiwanese steel industry, Brian Kelly and Mark London quoted a China Steel Corp. manager at a plant inundated with deadly steel filings as saying, "This is why you Americans give up. . . . You cannot tolerate a lot of dirt." KELLY & LONDON, *supra* note 3, at 209.

43. See, e.g., *Central Government, in* REPUBLIC OF CHINA YEARBOOK 1991-1992, at 85, 86 (Kwang Hwa Publishing Co., 1991) [hereinafter R.O.C. YEARBOOK] (using an organization chart of the central government to show its extremely hierarchical structure); *Local Government, in* R.O.C. YEARBOOK, *supra*, at 109, 110 (providing an organizational chart of the local government system).

44. R.O.C. YEARBOOK, *supra* note 43, at 86, 110.

45. See *supra* note 16 and *infra* text accompanying note 48.

46. See HSING-CHENG YÜAN, HUAN-CHING PAO-HU SHU [ENVIRONMENTAL PROTECTION ADMINISTRATION, EXECUTIVE YÜAN], CHIEN CHIEH [A BRIEF INTRODUCTION] 7 (1992). The eighth, and newest, bureau is responsible for the planning, reduction-to-practice, and transfer

At the national level, some environmentally related issues still come under the purview of ministries such as the Ministry of the Interior, the Council of Agriculture, and the Ministry of Economic Affairs.<sup>47</sup> On the regional level, the EPA supervises the Taipei Province Department of Environmental Protection (DEP) and the Taipei and Kaohsiung municipal departments of environmental protection.<sup>48</sup> The activities of these county- and city-level environmental protection bureaus enhance the work of the EPA, its subunits, and the ministries.<sup>49</sup> In addition, government-affiliated and private research institutions have a significant role in formulating Taiwan's environmental policies.<sup>50</sup> The problems of filtering environmental information, in the form of ideas, studies, directives, and punitive orders, through this vast network are foreseeable.

The Organic Statutes govern the structure, program scope, and operating personnel of administrative agencies.<sup>51</sup> For example, the

of environmental technology. *Id.* at 24.

Note: romanization of Chinese characters herein will conform to the rules of the Wade-Giles system of transliteration, as this is the system officially used in Taiwan. Titles and names previously transliterated by an author or publishing company, however, will remain in their original transliteration.

47. The Ministry of the Interior oversees a wide range of governmental agencies, including the Department of Public Works, which is responsible for construction of the island's sewage system and other projects; the Council of Agriculture, which includes members of the Fisheries, Forestries, and Conservation Departments, and which helps supervise and coordinate agriculture-related and other environmental problems, including pig farm pollution, protection of endangered wildlife and plant life, and drift net fishing; the Ministry of Economic Affairs (MOEA), which includes the Commission of National Corporations, the Department of Environmental Protection for State-Run Enterprises, the Industrial Development Bureau, the Water Resources Planning Commission, and the Energy Commission, and which manages energy and natural resources preservation through these subagencies. Taiwan, *Int'l Envtl. Rep.* (BNA) No. S-117, at 210 (May 1993) [hereinafter Taiwan BNA]. In particular, the MOEA oversees industry compliance with national effluent standards, including inspecting and issuing certificates of approval for industrial waste treatment facilities through its Industrial Development Bureau. *Id.*

48. See R.O.C. YEARBOOK, *supra* note 43, at 225-26.

49. See Taiwan BNA, *supra* note 47, at 209-10.

50. The National Institute of Environmental Analysis was established in 1990 to support the analytical needs of the EPA and to upgrade environmental analysis data. *Id.* at 210-11. Other institutions providing support for the EPA include the National (Environmental) Laboratory Institute, the Environmental Research and Development Institute, the Industrial Research and Technology Institute, the National Science Council, Academia Sinica, and the Environment and Development Task Force. *Id.*

51. See, e.g., Hsing-Cheng Yüan Huan-Ching Pao-Hu Shu Huan-Ching Pao-Hu Jen-Yüan Hsün-Lien Suo [Organic Statute of the Environmental Personnel Training Institute, Executive Yüan (Branch)] (1990), reprinted in Huan-Pao T'ung-Hsün She [Environmental Protection Information Agency], Huan-Ching Fa-Ling [Environmental Laws] I(11)-(12) (1992) [hereinafter EPIA ENVIRONMENTAL LAWS (in Chinese)] (providing the Organic Statute for this particular



Organic Statute of the EPA<sup>52</sup> allows for the hiring of a minimum of 331 and a maximum of 394 permanent employees to staff the EPA.<sup>53</sup> This provides a combined employment flexibility of only sixty-three persons, severely hindering the ability of the EPA to expand activities in response to environmental threats.<sup>54</sup>

The budgetary trend in Taiwan has been to increase funding support for the EPA.<sup>55</sup> The EPA started its work in 1987 with the equivalent of a budget of approximately U.S. \$6 million.<sup>56</sup> Recent figures place the April 1993 proposed EPA budget at roughly U.S. \$435 million, a 7,250 percent increase over the agency's initial budget.<sup>57</sup> Even more impressive is the fact that the budgets for ongoing or proposed major EPA projects contained in the Six-Year Plan for fiscal year 1992 to fiscal year 1997 amount to approximately U.S. \$13.2 billion.<sup>58</sup> In tandem with appropriations to be made under the Six-Year Plan, the EPA's ambitious Green Plan targets nineteen areas for focused relief at a cost of U.S. \$3.3 billion.<sup>59</sup>

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institute). The Organic Statute of the EPA provides for the establishment of further suborganizations. See Hsing-Cheng Yüan Huan-Ching Pao-Hu Shu Tsu-Chih T'iao-Li [Organic Statute of the Bureau of Environmental Protection Administration, Executive Yüan] (1987) § 22, *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra*, at I(7).

52. See Organic Statute of the Bureau of Environmental Protection Administration, Executive Yüan, *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at I(1)-(7).

53. The employment quotas for each department of the EPA are explicitly provided for in the Organic Statute. See Organic Statute of the Bureau of Environmental Protection Administration, §§ 13-18, *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at I(5)-(6). Employment provisions for provincial and municipal agencies are expressed in those agencies' respective Organic Statutes. See, e.g., T'ai-Pei Shih-Cheng-Fu Huan-Ching Pao-Hu Chü Tsu-Chih Kui-Ch'eng [Organic Statute of the Bureau of Environmental Protection, Taipei City] (as amended 1989), *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at I(13)-(15).

54. See TE-CHUNG TANG, *supra* note 16, at 325 ("[Considering] the numerous polluting sources, however, the environmental protection personnel forces are still insufficient.").

55. However, the EPA's budget will be proportionately affected by spending cuts in the Six-Year Plan, which were announced in March 1993. See Taiwan BNA, *supra* note 47, at 206-07.

56. See Michael Scott Feeley, *Environmental Protection: New Regulations Changing the Way to do Business*, E. ASIAN EXECUTIVE REP., Nov. 1990, at 15.

57. See Taiwan BNA, *supra* note 47, at 206.

58. See American Institute in Taiwan, *Major Projects: Environmental Protection Administration Projects in Taiwan's Six-Year Plan Total USD 10.7 Billion*, 1991 National Trade Data Bank, Market Reports, May 20, 1991, available in LEXIS, World Library, ASIAPC File. The total budget of U.S. \$13.2 billion was calculated by incorporating the budgets for joint projects of the EPA and other groups, including MOEA, the Council of Agriculture, provincial authorities, municipal authorities, and the Taiwan Sugar Corporation.

59. See Taiwan BNA, *supra* note 47, at 207. Note, however, that more than 80 percent of the funding requests in the Green Plan represent requests already made under the Six-Year Plan. See *id.*

These funds, however, must still be stretched to cover expanding operations and program costs.<sup>60</sup> Furthermore, many serious problems still need to be addressed by comprehensive or improved EPA initiatives.<sup>61</sup>

Popular support is also critical to the success of the EPA's efforts, but it is difficult to maintain in a situation where the populace is growing wary of government-sponsored actions in an increasingly open political atmosphere.<sup>62</sup> Public education, therefore, is a key component of EPA program acceptance and effectiveness.<sup>63</sup>

### C. Grassroots Movements, Green Organizations, and Envirotech

Insufficiencies at the governmental and legal levels have ignited popular protests in Taiwan aimed at changing the government's regulatory responses to environmental problems.<sup>64</sup> Public discontent is exacerbated by the fact that the Taiwanese legal system limits the use of citizen suits,<sup>65</sup> and legal challenges to rule-making are not

60. The EPA also has plans for spending roughly U.S. \$19.3 billion on the construction of sewage systems by the year 2000. *See ROC to Spend NT Dollars 500 Billion on Sewage System by 2000*, Central News Agency, July 18, 1989, available in LEXIS, ASIAPC Library, ALLASI File. As of 1989 only 3.3 percent of Taiwan's population was served by a sewage system; the new system would increase access to 42 percent of the population. *See id.*

61. Traffic congestion problems in Taiwan's larger cities have yet to receive adequate EPA action. *See* George Wehrfritz, *Taiwan: Asia's Richest, but Also Dirtiest*, FAR E. ECON. REV., Oct. 29, 1992, at 58 (noting that Taiwan's vehicle concentration is the second highest in Asia behind Singapore); American Institute in Taiwan, *supra* note 58 (citing traffic congestion as an environmental problem not specifically addressed in the Six-Year Plan project totals).

62. Protests by the opposition Democratic Progressive Party were instrumental in moving the government to elevate the Health Administration's Environmental Protection Department to Cabinet level status. *See* Stephen Baker et al., *Will the Planet Pay the Price for Third World Debt?*, BUS. WK., Oct. 24, 1988, at 88L ("[S]trong support for the opposition . . . forced the ruling Kuomintang to form an environmental protection agency and spend more money on [environmental] cleanup projects."). However, many of the EPA's actions still provide welcome fodder for environmental activists. Wehrfritz, *supra* note 61, at 38 ("[E]nvironmentalists believe the agency has been kept weak by a government worried that higher environmental standards could inhibit economic growth.").

63. Public education is specifically provided for under the Hsing-Cheng Yüan Huan-Ching Pao-Hu Shu Tsu-Chih T'iao-Li [Organic Statute of the Bureau of Environmental Protection Administration, Executive Yüan] (1990) § 5(8), reprinted in EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at I(2). The Six-Year Plan has targeted U.S. \$10 million for "Environmental Protection Education and Publicity." American Institute in Taiwan, *supra* note 58.

64. *See* Feeley, *supra* note 28, at 916-17.

65. For example, Taiwanese air pollution control laws do not provide for citizen suits as a means of enforcement. *See* TE-CHUNG TANG, *supra* note 16, at 338.

allowed.<sup>66</sup> Moreover, there is no legal basis for public comments or hearings on major EPA actions.<sup>67</sup> In response to growing civil disobedience and activism,<sup>68</sup> the EPA issued guidelines which indicated "acceptable protest practices," and the Taiwanese Government proposed draft legislation which included severe penalties for the blockage of industrial plants.<sup>69</sup> Although the government has implemented a rigid registration/permit program through the Voluntary Association Act,<sup>70</sup> nongovernmental environmental organizations such as Formosa Greenpeace are flourishing.<sup>71</sup> Bookstores and related vendors have also experienced a significant increase in the amount of environmental protection-specific periodicals available to the general public.<sup>72</sup> As a result, increased environ-

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66. Hsing-Cheng Su-Sung Fa [Administrative Litigation Act] § 1 LIU-FA CHUAN-SHU [COMPLETE VOLUME OF SIX LAWS] 1167 (Chang Chi-pen & Chi-tung eds., Ta Chung-Kuo Tu-Shu Co. 1991); Yeh Jiunn-Rong, *supra* note 32, at 91. Note that "the legality of regulations as applied may be challenged in particular cases." *Id.*

67. *Id.* at 95.

68. *See id.* at 96; *see also* *Policeman Said Killed in Antinuclear Protest*, Taiwan (FBIS) FBIS-CHI-91-192, Oct. 3, 1991, at 56; *Activists Demonstrate Against Nuclear Power Plant*, Taiwan (FBIS) FBIS-CHI-92-052, Mar. 17, 1992, at 69.

69. Yeh Jiunn-Rong, *supra* note 32, at 96. The bill originally stipulated that blockage of industrial plants could be a basis for capital punishment. *Id.* A likely origin for this bill would be the anxiety generated by these protests, of which there were thirteen in 1985. Hung-mao Tien, *Social Change and Political Development in Taiwan*, in *TAIWAN IN A TIME OF TRANSITION* 1, 24 (Harvey Feldman & Ilpyong J. Kim eds., 1988).

70. Yeh Jiunn-Rong, *supra* note 32, at 97.

71. The size and activities of nongovernmental organizations (NGOs) vary greatly. Telephone Interview with Yeh Jiunn-Rong, Professor of Environmental Law, National Tsing-Hua University, in Taipei, Taiwan (Jan. 7, 1993) (noting that popular environmental NGOs include radical, institutional, and women's group offshoots). Environmental NGOs in Taiwan include Earth Day Taiwan, which is involved in environmental education, political campaigns and lobbying, publishing, and green consumerism and marketing; the Taiwan Environmental Protection Union; the New Environment Foundation, which is a comparatively moderate group; the Anti-Nuclear Coalition for Taiwan, which publishes the *Nuclear Report from Taiwan*; the Homemaker's Union & Foundation; and the Asian Ecological Society. *See* WORLDWIDE AND FRIENDS OF THE EARTH, INTERNATIONAL DIRECTORY OF NON-GOVERNMENTAL ORGANIZATIONS 114 (1992) (mentioning Taiwan Environmental Protection Union); Yeh Jiunn-Rong, *supra* note 32, at 97 (mentioning New Environment Foundation). In addition, Taiwan's Pollution Prevention Association was a key force in rallying public opinion against the environmental degradation caused by chemical plants such as DuPont Taiwan. *See* Yang-sun Chou, *supra* note 12, at 180-93.

72. Numerous publications target the pollution control industry, including *Environmental Protection and Economics Magazine* (in Chinese) and *Journal of Water and Waste* (in Japanese). *Taiwan Pollution Control Eq./Svcs*, 1991 National Trade Data Bank, Market Reports, July 19, 1991, available in LEXIS, ASIAPC Library, ALLASI File.

mental awareness and regulatory pressures have created fertile ground for a nascent environmental technology industry.<sup>73</sup>

#### D. Environmental Legislation

1. *Air Pollution.* The Air Pollution Control Act (APCA)<sup>74</sup> contains only twenty-eight articles (excluding the enforcement and supplementary rules) and basically mandates emissions over ambient standards.<sup>75</sup> Section 5 of the APCA requires that provincial and county-level departments consult the competent authorities and develop various "control districts" based on the air quality of each district and "air quality standards."<sup>76</sup> This methodology has been criticized in view of the lack of the establishment of clear, statutorily prescribed goals for the attainment of emissions standards.<sup>77</sup>

Despite this failing, the current trend in Taiwan's air quality regulation points to greater specificity. The government has developed a range of emissions standards for control of four point sources of pollution. These point sources are stationary (industrial and fuel burning), vehicular, solid waste disposal (open burning), and construction-related.<sup>78</sup> In view of the overwhelming number of

73. Pollution control technology imports are expected to experience resounding growth. See *Rapidly Growing Markets for Pollution Control Equipment*, E. ASIAN EXECUTIVE REP., May 1988, at 24-26; see also *Taiwan-Architectural/Construction/Engineering Services*, 1991 National Trade Data Bank, Market Reports, June 11, 1991, available in LEXIS, ASIAPC Library, ALLASI File ("Although the environmental engineering market is taking time to mature, it represents one of the main prospects for overseas engineering expertise as expenditure over the next ten years is estimated at US\$ 30 billion."). Companies outside of Taiwan have apparently taken heed of this forecast. According to *Taiwan Pollution Control Eq./Svcs*, *supra* note 72, a number of foreign pollution control product and service companies have already entered the Taiwan market. These include Amoco, General Electric Environmental Systems, Monsanto, National Oil, Teledyne, Kawasaki, Mitsubishi, Nippon Oil, Samtech, CH2MHill, Polysius, Asea Brown Boveri, and Korea Cottrell.

74. K'ung-Ch'i Wu Fang-Chih Fa [Air Pollution Control Act] (as amended 1992), *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at II(1).

75. See generally *id.* (mandating creation of air pollution control regions and proposing emissions standards based on conditions of every control region); see also TE-CHUNG TANG, *supra* note 16, at 333.

76. See Air Pollution Control Act, ch. 2, § 5, *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at II(1); see also Taiwan BNA, *supra* note 47, at 213.

77. See TE-CHUNG TANG, *supra* note 16, at 333-40. Note that these emissions standards are not necessarily based upon a desire to protect people's health. See *id.* Instead, a technological basis may be inferred from a reading of the Air Pollution Control Act, ch. 3, §§ 13-14, *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at II(3)-(4).

78. Feeley, *supra* note 56, at 15.

motor vehicles in Taiwan,<sup>79</sup> this emissions source has received much attention. In recent years, vehicle emissions standards were proposed for implementation in increasingly stringent stages.<sup>80</sup> Taiwan's emissions standards are currently comparable to those required in the United States under the National Ambient Air Quality Standards (NAAQS) program.<sup>81</sup> In combination with the effectuation of more exacting standards, Taiwan implemented a Low Sulfur Fuel Policy to reduce the amount of sulfur oxide emitted by vehicles.<sup>82</sup> To facilitate air quality control among the other targeted point sources, Section 7 of the APCA mandates the placement of air pollutant monitoring stations around the island and the periodic announcement of air quality conditions.<sup>83</sup> Section 8 requires that the public be informed of "serious" changes in air quality and authorizes the EPA or local agency to limit or halt use of motor vehicles or emissions from public and private locations.<sup>84</sup> Particularly directed towards the control of industrial pollutants, Section 13 requires that publicly or privately owned stationary pollution sources be equipped with automatic monitoring and antipollution equipment, that this equipment not be limited by emissions standards under Article 11, paragraph 1, that the equipment be kept operational, and that emissions do not exceed the capacity of the equipment.<sup>85</sup> Lastly, Section 14 includes the requirement that permits must be issued for the design and operation of this antipollution equipment.<sup>86</sup>

2. *Noise Pollution.* In a 1983 survey, roughly three-quarters of Taiwan citizens viewed common environmental problems, including

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79. See *supra* text accompanying note 13.

80. See Chiao-T'ung Kung-Chü K'ung-Ch'i Wu-Jan Wuh P'ai-Fang Piao-Chün [Vehicular Air Pollutants Emissions Standards], §§ 1-8, *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at II(94); see also Taiwan BNA, *supra* note 47, at 213.

81. Under the United States NAAQS program, the Environmental Protection Agency sets maximum permissible concentration levels for "six 'criteria' pollutants: carbon monoxide, lead, nitrogen oxides, ozone, particulates, and sulfur oxides." Donald W. Stever & John T.S. Williams, *Environmental Law of the United States of America*, in INT'L ENVTL LAW & REG., at US-1, US-18 (1991). A chart outlining the Taiwanese standards is provided in K'ung-Ch'i Wu-Jan P'ai-Fang Piao-Chün [Air Pollutants Emissions Standards], *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at II(33) (chart).

82. Feeley, *supra* note 28, at 921.

83. See Air Pollution Control Act, ch. 2, § 7, *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at II(2).

84. See *id.* § 8.

85. See *id.* § 13.

86. See *id.* § 14; see also Taiwan BNA, *supra* note 47, at 213.

noise pollution, as likely to get worse in the future.<sup>87</sup> Four years later EPA records indicated that "about 50% of the environmental pollutions complaints received by governmental agencies [were] for noise pollution."<sup>88</sup> The Noise Pollution Control Act of 1992<sup>89</sup> (and eleven other related pieces of legislation) sets out the methodology for the control of noise pollution from aircraft,<sup>90</sup> motor vehicles,<sup>91</sup> factories, construction sites,<sup>92</sup> and entertainment establishments;<sup>93</sup> from familial activities such as funerals and weddings,<sup>94</sup> and from the use of firecrackers; and from the service industry, including restaurants, printers, and other establishments using power machinery.<sup>95</sup>

The Noise Pollution Control Standards Act (NPCSA)<sup>96</sup> sets different decibal limits for early morning (5:00 A.M.-7:00 A.M.), evening (8:00 P.M.-10:00 P.M. in rural areas, 8:00 P.M.-11:00 P.M. in urban areas), daytime (7:00 A.M.-8:00 P.M.), and late night (10:00 P.M.-5:00 A.M. in rural areas, 11:00 P.M.-5:00 A.M. in urban areas).<sup>97</sup> Fines for violating the various provisions of the NPCSA are set out in Section 15.<sup>98</sup> For example, factories breaching the noise standards may be fined no less than N.T. \$6,000 and no more than N.T. \$60,000 (approximately U.S. \$230 and U.S. \$2,280 at current exchange rates).

3. *Water Pollution.* "The combination [in Taiwan] of scarce water, massive discharges [of wastewater], and [virtually] nonexistent sewage treatment creates an overwhelming water contamination crisis."<sup>99</sup> In an attempt to combat potential catastrophe, the Water Pollution Prevention Act (WPPA)<sup>100</sup> "covers all above-ground water

87. TAIWAN 2000: BALANCING ECONOMIC GROWTH AND ENVIRONMENTAL PROTECTION 358 (The Steering Committee Taiwan 2000 Study eds., 1989).

88. TE-CHUNG TANG, *supra* note 16, at 357 n.1033.

89. Tsao-Yin Kuan-Chih Fa [Noise Control Act] (as amended 1992), *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at III(1).

90. *See id.* § 10.

91. *See id.*

92. *See id.* § 7(1), (4).

93. *See id.* § 7(2).

94. *See id.* § 6(1)-(2).

95. *See id.* § 6(3).

96. Tsao-Yin Kuan-Chih Piao-Chün [Noise Pollution Control Standards Act] (1985), *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at III(10).

97. *See id.*

98. Noise Control Act, ch. 3, § 15(1), *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at III(3).

99. Feeley, *supra* note 28, at 922.

100. Shui Wu-Jan Fang-Chih [Water Pollution Prevention Act] (as amended 1991), *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at IV(1).

sources including rivers, lakes, ponds, reservoirs, the ocean, and irrigation channels, as well as underground water sources."<sup>101</sup> The WPPA provisions address the most significant water pollution problems. Under Section 5, hindrance of the use of waters by discharging or transporting effluents that exceed the waters' assimilative capacity is prohibited.<sup>102</sup> Section 6—similar to the way Section 5 of the APCA sets out air control districts—mandates that the central authority indicate water districts according to the specific characteristics of the water to be protected and its geographic location.<sup>103</sup> Section 7 requires that any wastewater effluent (including that from sewage systems and construction sites, but excluding industrial wastewater) must conform to current effluent standards.<sup>104</sup> Key under this section is the provision allowing local-level departments to require stricter effluent standards than the national standard imposes.<sup>105</sup> This allows for flexibility to adjust for varied regional exigencies, such as the special protection afforded national parks,<sup>106</sup> and "special instances . . . [such as] droughts [which] reduce river levels [and] increas[e] the concentration of pollutants."<sup>107</sup>

The WPPA also requires that industries contemplating wastewater discharge apply for factory construction and discharge permits,<sup>108</sup> and establish and operate wastewater treatment facilities.<sup>109</sup> Penalties for violating the amended WPPA standards have increased ten times over the fines stipulated in the original Act.<sup>110</sup> Currently, under certain circumstances, a wastewater producer that fails to obtain a permit or to comply with other provisions of the WPPA can be fined as much as N.T. \$600,000 (approximately U.S.

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101. Taiwan BNA, *supra* note 47, at 213; *see also* Water Pollution Prevention Act, ch. 1, § 2(2)-(3), *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at IV(1).

102. *See* Water Pollution Prevention Act, ch. 2, § 5, *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at IV(3); *see also* TE-CHUNG TANG, *supra* note 16, at 353.

103. *See* Water Pollution Prevention Act, ch. 2, § 6, *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at IV(3).

104. *See id.* § 7, at IV(3). The current standards referred to in the WPPA are set out under Fang-Liu-Shui Piao-Chün [Effluent Standards], *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at IV(31).

105. *See* Water Pollution Prevention Act, ch. 2, § 7, para. 2, *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at IV(3).

106. Christopher Chang, *Amendment to Effluent Standards*, in LEE & LI BULL., July 1991, at 3, 4 (Lee & Li Law Firm, Taiwan).

107. Taiwan BNA, *supra* note 47, at 213.

108. R.O.C. YEARBOOK, *supra* note 43, at 293.

109. Taiwan BNA, *supra* note 47, at 213; R.O.C. YEARBOOK, *supra* note 43, at 293.

110. R.O.C. YEARBOOK, *supra* note 43, at 293.

\$22,830) per day or face incarceration for up to seven years.<sup>111</sup> The Taiwanese authorities have also made use of another severe penalty, an order to stop work or to temporarily close,<sup>112</sup> but have not made use of the more severe, and more controversial, criminal penalty provisions.<sup>113</sup>

4. *Toxic Substances Pollution.* The Toxic Chemical Management Act (TCMA)<sup>114</sup> governs the manufacture, import, export, sale, shipment, use, storage, and disposal of toxic chemicals.<sup>115</sup> Chemicals specifically listed by the EPA as toxic can only be sold, manufactured, or shipped under permit.<sup>116</sup> Labeling restrictions are also imposed on those shipping listed chemicals, requiring clear indication that the shipped materials are toxic chemicals and that handlers must take due care.<sup>117</sup> The TCMA requires manufacturers of toxic chemicals to observe stringent reporting requirements following accidents involving toxic chemicals that would endanger public health or the environment.<sup>118</sup> The statute also makes it incumbent upon the authorities receiving the accident report to commence quickly an on-site investigation, to provide clean-up, to ensure the proper flow of

111. *Id.*

112. This provision can be found in the Water Pollution Prevention Act, ch. 4, § 36, *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at IV(10).

113. *See* Taiwan BNA, *supra* note 47, at 213.

114. Tuh-Hsing Hua-Hsue Wuh-Chih Kuan-Li Fa [Toxic Chemical Management Act] (as amended 1988), *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at VI(1). The Enforcement Rules for the TCMA were promulgated in 1989, one year later. *See* Tuh-Hsing Hua-Hsue Wuh-Chih Kuan-Li Fa Sheh-Hsing Hsi-Tse [Enforcement Rules of the Toxic Chemical Management Act] (1989), *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at VI(7).

115. *See* Toxic Chemical Management Act, ch. 1, § 2(2), *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at VI(1).

116. Taiwan BNA, *supra* note 47, at 214. EPA-listed chemicals include polychlorinated biphenyls, chlordane, asbestos, dieldrin, DDT, toxaphene, pentachlorophenol, sodium pentachlorophenate, and methyl mercury, and are recorded in Yi-Kung Kao-Chih Tuh-Hsing Hua-Hsue Wuh-Chih-Lan-Piao [Toxic Chemicals Announcement], *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at VI(94). The EPA normally issues five-year permits, but these must be renewed every six months. Taiwan BNA, *supra* note 47, at 214.

117. *See* Tuh-Hsing Hua-Hsue Wuh-Chih Yun-Sung Kuan-Li Pan-Fa [Toxic Chemical Shipping Management Methods] (1991), *reprinted in* EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at VI(22).

118. Taiwan BNA, *supra* note 47, at 214.



information on the incident, and to use available methods to prevent the spread of the pollutant.<sup>119</sup>

Violations of the TCMA are treated with utmost gravity. Loss of life resulting from such violations may bring a maximum sanction of life imprisonment, or a minimum of seven years incarceration and a fine of N.T. \$300,000 (approximately U.S. \$11,420).<sup>120</sup> Serious injury resulting from a breach of the TCMA may bring a minimum of three years and a maximum of ten years in prison, and a fine of N.T. \$150,000 (approximately U.S. \$5,710).<sup>121</sup> Injury to health (including sickness) resulting from a violation of the statute will incur a maximum of three years in prison and a fine of N.T. \$90,000 (approximately U.S. \$3,425).<sup>122</sup>

5. *Other Environmental Problems.* The Waste Management Law<sup>123</sup> (covering the environmentally sound management of nonhazardous waste), the Pollution Damage Dispute Resolution Act,<sup>124</sup> and the Public Environmental Health Act<sup>125</sup> (covering issues such as drinking water quality and smoking in public places) have all been approved by the Taiwanese legislature. Several important laws are still pending approval. These include the Environmental Impact Assessment Act, the Residential Pesticides Control Act, and the Soil Pollution Control Act.<sup>126</sup>

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119. See Hsing-Cheng Yüan Huan-Ching Pao-Hu Shu Hua-Hsue Wuh-Chih Tsai-Hai T'ung-Pao Chi-Hua [Toxic Chemicals Disaster Reporting Plan (EPA), Executive Yüan] (as amended 1989), reprinted in EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at VI(67).

120. See Toxic Chemical Management Act, ch. 3, § 19, reprinted in EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at VI(4).

121. *Id.*

122. *Id.*

123. See Fei-Ch'i Wuh Ch'ing-Li [Waste Management Law], (as amended 1988), reprinted in EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at V(1).

124. See Kung-Hai Chiu-Fen Ch'uh-Li, [Pollution Damage Dispute Resolution Act] (1992), reprinted in EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at VIII(1). A detailed examination of the fifty-one sections of the Act is provided in ADMINISTRATIVE YÜAN, ENVIRONMENTAL PROTECTION DEP'T., KUNG-HAI CHIU-FEN CH'UH-LI PAI-SHU [POLLUTION DAMAGE DISPUTE RESOLUTION WHITE PAPER] (1992).

125. See Kung-Kung Huan-Ching Wei-Sheng [Public Environmental Health Act] (as amended 1972), reprinted in EPIA ENVIRONMENTAL LAWS (in Chinese), *supra* note 51, at VII(1).

126. Taiwan BNA, *supra* note 47, at 214.

### E. Future Concerns

As mentioned above, the EPA has made use of its more severe sanction power by closing polluting factories. Nonetheless, the Taiwanese government still faces far greater environmental challenges than those present today as citizens choose to use the emerging laws to alter the course of environmental policy. One area of contention has emerged partly because of Taiwan's confined geography and partly as a result of media exposure. The development of nuclear facilities to satisfy the island's increasing power demands led the government in 1981 to propose plans for a fourth nuclear plant.<sup>127</sup> Power generation is essential to Taiwan's continued economic vitality; however, there are many uncertainties attendant to nuclear power generation and nuclear waste disposal, particularly on an island where the only remote areas are located on inhospitable mountaintops.<sup>128</sup> As both the residential population and the forces for development vie for real estate within Taiwan's approximately 36,000 square kilometers, nuclear power production and hazardous waste disposal will be among the greatest test areas for environmental legislation. Even as citizens' lives are touched by the intangible threats posed by radiation or toxic chemicals, it is unlikely that the closure of vital power-producing facilities will provide an answer, nor will the threat of three years imprisonment or a fine of roughly N.T. \$300,000 (approximately U.S. \$11,420) under the Toxic Chemicals Management Act prevent severe environmental accidents, assuage contamination fears, or significantly modify policy-makers' decisions.

## III. HONG KONG

### A. History

During the first half of the nineteenth century, China's contacts and conflicts with the West resulted in the formation of a foreign protectorate at the southeastern edge of Canton, centered around what is still known as the "Fragrant Harbor."<sup>129</sup> Considered a

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127. See *Minister Says Fourth Nuclear Plant 'Vital,' Taiwan* (FBIS) FBIS-CHI-91-178, at 54 (Sept. 12, 1991).

128. See *Where Will We Put It? The Future of Taiwan's Nuclear Waste*, NUCLEAR REP. FROM TAIWAN, May-June 1993, at 4, 5. Waste storage at higher elevations increases the likelihood that leakage will impact the densely populated regions below. See *id.* at 5.

129. GIBNEY, *supra* note 7, at 45, 48. "Hong Kong" is the English transliteration of the

British base even before it was officially brought under the subjugation of the English Crown,<sup>130</sup> Hong Kong, the "bare island with hardly a house upon it,"<sup>131</sup> was ceded to Britain at the end of the First Opium War in 1842.<sup>132</sup> Shortly thereafter, in 1852, the Kowloon Peninsula was added to the Crown's war spoils.<sup>133</sup> The New Territories were acquired by Britain in 1898 through a leasing arrangement that was to endure ninety-nine years,<sup>134</sup> and now comprise the frontier of the present-day regions referred to as "Hong Kong."<sup>135</sup>

Constrained within a land area thirty-four times smaller than Taiwan,<sup>136</sup> economic development altered the face of Hong Kong with proportionate rapidity.<sup>137</sup> Three decades ago, urban expansion overflowed from Hong Kong Island and Kowloon into the New Territories with "the growth of eight new towns . . . which now are home to over one-third of the population."<sup>138</sup> Since that time, a deceptively laissez faire economic policy<sup>139</sup> bolstered the flexibility of Hong Kong's entrepreneurs<sup>140</sup> so that "[b]y 1990, the average per capita income in [the colony] had grown to surpass that of its colonial

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Cantonese phrase *Heung Gong*, meaning "fragrant harbor." See Karp, *supra* note 19, at 31.

130. SIMON WINCHESTER, *THE SUN NEVER SETS: TRAVELS TO THE REMAINING OUTPOSTS OF THE BRITISH EMPIRE* 169 (1985).

131. KELLY & LONDON, *supra* note 3, at 258 (quoting Viscount Palmerston, Foreign Secretary to the British Crown).

132. See GIBNEY, *supra* note 7, at 235; Edmonds, *supra* note 3, at 175.

133. See Edmonds, *supra* note 3, at 175.

134. *Id.*

135. The New Territories form the colony's border with the P.R.C. and contain the last vestiges of rural land. See *id.* at 180.

136. *Id.* at 175.

137. For an account of Hong Kong's early development plans, see R.C. Clarke & J.E. Jackson, *Land for Industry and Factors Influencing Location in Hong Kong*, in *LAND USE AND MINERAL DEPOSITS IN HONG KONG, SOUTHERN CHINA AND SOUTH-EAST ASIA* (S.G. Davis ed., 1964); see also *ASIAN URBANIZATION: A HONG KONG CASEBOOK* (D.J. Dwyer ed., 1971).

138. Edmonds, *supra* note 3, at 177.

139. Due to "[t]he absence of government restrictions on capital, labor and enterprise," Hong Kong's government has frequently been referred to as laissez faire regarding its relationship with the business sector. Pang Eng Fong, *supra* note 3, at 226. However, the government of Hong Kong "is an active participant in the land market . . . [and] makes policies on many matters, including transportation, labor, education, and social services." *Id.*

140. One of the key factors behind Hong Kong's economic primacy has been the fostering of small-scale entrepreneurs capable of taking quick advantage of new business opportunities, see *id.* at 230, with a flexibility that is impossible for large, multinational corporations, see VOGEL, *supra* note 3, at 73. The wasteful focus of these small firms on short-term profit has been one of the reasons for the government's increasing role in the Hong Kong economy. Pang Eng Fong, *supra* note 3, at 231.

motherland."<sup>141</sup> More recently, the expanding relationship between the Hong Kong and Chinese governments has apparently been a driving force behind Hong Kong's economic accomplishments.<sup>142</sup> The colony's industrial success is increasingly dependent on the mainland,<sup>143</sup> a fact that has stimulated business planning that looks beyond Hong Kong's borders.<sup>144</sup>

The Basic Law of the Hong Kong Special Administrative Region of the People's Republic of China sets up the governing rules for the management of the former colony when the Chinese government takes over on July 1, 1997.<sup>145</sup> The Basic Law states that Hong Kong will become an administrative region of China, and will "enjoy a high degree of autonomy and come directly under the central People's Government."<sup>146</sup> Surprisingly, the Chinese government has promised that it will allow Hong Kong's capitalist system and sense of autonomy to remain intact for fifty years beyond 1997.<sup>147</sup> This has not, however, prevented the prospective merger of the two disparate polities from causing a preparatory shift towards accommodation on the part of Hong Kong's legal system.<sup>148</sup>

141. VOGEL, *supra* note 3, at 68.

142. *See id.* at 69.

143. For example, once industrial development in Hong Kong had expanded sufficiently to make the use of large tracts of land for agricultural purposes cost-ineffective, "the agricultural hinterland became the Pearl River Delta area of China's Guangdong Province." *Id.* at 67. Of course, the P.R.C. derives benefits from the Hong Kong market. JAMES RIEDEL, *THE INDUSTRIALIZATION OF HONG KONG 3* (Institut für Weltwirtschaft an der Universität Kiel, Tübingen 1974).

144. One commentator has noted that, regarding environmental planning, it may soon prove "easier to dump wastes in Guangdong Province . . . than to look for sophisticated and expensive local solutions." Edmonds, *supra* note 3, at 180. For a description of the changing relationship between the P.R.C. and Hong Kong, see EZRA F. VOGEL, *ONE STEP AHEAD IN CHINA: GUANGDONG UNDER REFORM 43-75* (1989).

145. *See* The Basic Law of Hong Kong Special Administrative Region of the People's Republic of China, Apr. 4, 1990, *reprinted in* 6 CONSTITUTIONS OF DEPENDENCIES AND SPECIAL SOVEREIGNTIES (Albert P. Blaustein ed., 1992) [hereinafter *The Basic Law of Hong Kong*]. For a detailed discussion of *The Basic Law of Hong Kong*, see PETER WESLEY-SMITH & ALBERT H.Y. CHEN, *THE BASIC LAW AND HONG KONG'S FUTURE* (1988).

146. *See* *The Basic Law of Hong Kong*, *supra* note 145, art. 12.

147. VOGEL, *supra* note 3, at 69.

148. For example, the Colonial Laws Validity Act 1865 provided that "a colony cannot enact valid laws which are 'repugnant' to an English statute which has been extended to that particular colony." Michael J. Downey, *The Laws of Hong Kong*, 19 H.K.L.J. 147, 191 n.67 (1989). Recently, however, "the *Hong Kong (Legislative Powers) Order 1986* . . . authorize[d] the enactment of ordinances which are capable of repealing certain categories of British enactments." *Id.* Moreover, the transitional status of the colony has created a controversy concerning the use of bilingual (English-Chinese) legislation. *See generally* Albert H.Y. Chen, *The Bilingual Legal System in Hong Kong: A Gloomy Future*, 21 H.K.L.J. 14, 14-18 (1991). For

It appears promising that the Hong Kong economy has prevailed despite the shifting relationship with China and Britain and a convoluted legal system.<sup>149</sup> Worry over the impending change of government<sup>150</sup> and the colony's natural limitations,<sup>151</sup> however, add to the obstacles that are threatening Hong Kong's continued success. To avert disaster, the international port must shatter its image as a temporary base for short-term profit. In this way it will be able to work with its heterogeneous population<sup>152</sup> in support of a far-sighted goal—the preservation of the environment.

## B. Regulatory Authorities

"One of the things [environmental organizations] are trying to work at now is to [promote creation of] one government department solely responsible for conservation, rather than a large number of departments sort of dabbling in conservation."<sup>153</sup> Environmentalists in Hong Kong often point out the fact that the colony lacks a true central agency of environmental policy and regulation.<sup>154</sup> A cursory

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a comprehensive analysis of the difficulties inherent in the merger of Hong Kong and Chinese legal systems, see BERRY FONG-CHUNG HSU, *THE COMMON LAW SYSTEM IN CHINESE CONTEXT: HONG KONG IN TRANSITION* *passim* (1992).

149. "As of December 31, 1987, the LAWS OF HONG KONG comprised 523 ordinances and 944 items of subsidiary legislation." Downey, *supra* note 148, at 168. "The term 'ordinance' is defined . . . to include any subsidiary legislation made under or by virtue of any ordinance." *Id.* at 172. Only "some of this recent legislation will have [truly] become incorporated into the LAWS OF HONG KONG [in English or in Chinese] by way of amendment, addition, replacement or repeal." *Id.* at 147. Determining the current state of the law on any one topic is made more difficult by the fact that revisions in the LAWS can take between eight and twenty months to prepare and print. See *id.* at 189 n.57. Further complicating the interpretation of the instruments contained in the voluminous LAWS OF HONG KONG is the fact that many of the documents are not "law" and are published for information only. *Id.* at 189 & n.56.

150. "Emigration from Hong Kong has increased since the signing of the Sino-British accord over Hong Kong's future in 1985 and particularly since the Tiananmen Massacre of 1989." Edmonds, *supra* note 3, at 177; see also Danny Kin-King Lam, *Hong Kong Chinese Emigration and Investment Patterns in Response to the 1997 Problem*, 9 J. N.E. ASIAN STUD. 60, 60-79 (1990).

151. It is estimated that only 9 percent of the land in Hong Kong is arable. Edmonds, *supra* note 3, at 179.

152. Hong Kong's population is composed primarily of people from Hong Kong itself, Guangdong Province, or Macau. The number of persons of British origin is comparatively small. The major religious groups represented in the colony are Buddhism, Taoism, and the Christian, Muslim, Hindu, Sikh, and Jewish faiths. *Id.* at 182. The teachings of Confucius are also followed. See GIBNEY, *supra* note 7, at 253-54.

153. Telephone Interview with Henry Morritt, Campaign Officer, Friends of the Earth, Hong Kong (Jan. 7, 1993) (on file with author).

154. See *Environmentalists Ask HK Conservation Authority*, Reuters Library Report, Nov. 30, 1992, available in LEXIS, Nexis Library, OMNI File ("At present environmental issues are

view of a listing of Hong Kong governmental divisions would lead to the assumption that, in name at least, the Hong Kong Environmental Protection Department (EPD) is the main administrative unit.<sup>155</sup> In reality, it is the Secretary for Planning, Environment and Lands (SPEL), located at the Environmental Division of the Planning, Environment and Lands Branch, that has overall responsibility for policy on environmental protection.<sup>156</sup> Unlike the Administrator of Taiwan's EPA, the Secretary is associated with a different section of the government and must report directly to the Executive and Legislative Councils for approval regarding major policy objectives such as those involving new legislation.<sup>157</sup> The Environmental Pollution Advisory Committee (EPCOM)<sup>158</sup> provides advice to SPEL on all pollution-related matters.<sup>159</sup> The EPD provides SPEL with "assistance in the formulation of new policies and programmes."<sup>160</sup> The importance of the EPD derives primarily from its executive role as the main enforcement organ in Hong Kong's environmental regulatory system.<sup>161</sup>

In contrast with the increasingly centralized environmental control system in the United Kingdom,<sup>162</sup> Hong Kong's environmental protection responsibility is further distributed among government departments in charge of education, civil engineering services, drainage services, electrical and mechanical services, highways, regional services, territory development, urban services, and various other departments<sup>163</sup> such as the Agriculture and Fisheries Depart-

handled jointly by the government's Environmental Protection Department and the Planning, Environment and Lands Branch.").

155. See ENVIRONMENTAL PROTECTION DEPARTMENT, ENVIRONMENT HONG KONG 1992: A REVIEW OF 1991, Table 1.1, at 22 (1992) [hereinafter ENVIRONMENT H.K. 1992].

156. See HONG KONG GOVERNMENT INFORMATION SERVICES, HONG KONG 1992, at 351 (16th ed. 1992) [hereinafter H.K. YEARBOOK].

157. See ENVIRONMENT H.K. 1992, *supra* note 155, at 21.

158. EPCOM has an entirely nongovernmental membership appointed by the Governor of Hong Kong. *Id.* at 21. Such appointments include members representing industry and environmental groups. *Id.* at 133. Moreover, the Secretary for Planning, Environment and Lands (SPEL) (or the Secretary's representative), the Director of Environmental Protection, and the Director of Planning have privileges of permanent attendance. *Id.* at 157.

159. *Id.* at 21.

160. *Id.*

161. *Id.*

162. "Central [environmental] control, exercisable through the recently unified HMIP [Her Majesty's Inspectorate of Pollution], will become more frequent as the body of environmental legislation grows." Ian Doolittle, *Environmental Law of the United Kingdom*, in INT'L ENVTL. LAW AND REG. § 3.1, UK-18 (J. Andrew Schlickman et al. eds., 1991).

163. See ENVIRONMENT H.K. 1992, *supra* note 155, at 21-22.

ment, the Marine Department, and the Planning Department.<sup>164</sup> Hong Kong's diminutive size obviates any real need for local or regional branches of any of these departments. This is, however, just as well, since the division of environmental labor among the government departments already presents a complicated web that is not easy to trace.<sup>165</sup>

Although the EPD is not the government unit responsible for final decisions on environmental policy,<sup>166</sup> its role is nonetheless crucial to the implementation and success of environmental legislation.<sup>167</sup> The particularly serious and multifaceted environmental problems faced by the colony<sup>168</sup> led to the publishing of a White Paper, *Pollution in Hong Kong—A Time to Act*, in June 1989.<sup>169</sup> This document set out a ten-year plan of action for the infant EPD and related divisions of other departments.<sup>170</sup> In addition to providing effectiveness reviews and making policy recommendations for new or amended legislation, the EPD is responsible for enforcing pollution control legislation, monitoring environmental quality, planning treatment and disposal for all types of wastes, and conducting environmental impact assessments of town plans, large industrial plants, and any other developments that might have a significant

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164. See H.K. YEARBOOK, *supra* note 156, at 351-52.

165. Within each department are divisions that may have environmentally related responsibilities. For example, there are six divisions within the Agriculture and Fisheries Department having environmental responsibilities. See ENVIRONMENTAL PROTECTION DEPARTMENT, ENVIRONMENT HONG KONG 1989: A REVIEW OF 1988, at 188-89 (1989) [hereinafter ENVIRONMENT H.K. 1989].

166. See ENVIRONMENT H.K. 1992, *supra* note 155, at 21.

167. The EPD has general responsibility for carrying out and enforcing the environmental mandates of SPEL, *id.*, hence the public's ready criticism of the department when conditions do not improve according to governmental promises. Despite pessimism regarding Hong Kong's ability to embrace stronger regulations and forego its renowned laissez faire economy, the EPD has recorded some victories. Following the introduction of low-sulfur fuel requirements in July 1990, "sulphur dioxide levels in some places had dropped by up to 80 percent, dark smoke emissions from chimneys had been almost eliminated and nitrogen dioxide concentrations had been reduced substantially." *Hong Kong: EPD Chief Wants Less Talk of Doom*, S. CHINA MORNING POST, Nov. 27, 1990, at 2.

168. Environmental difficulties that affect the colony's current international relations serve as primary examples. See, e.g., *Hong Kong: Environmental Protection Department Considers a Privatized Sewage Treatment and Disposal Scheme*, Construction News, Reuters, May 5, 1989, available in LEXIS, ASIAPC Library, TXPRIM File (describing environmental difficulties affecting Hong Kong's relations with the P.R.C.).

169. THE HONG KONG GOV'T, THE WHITE PAPER: POLLUTION IN HONG KONG—A TIME TO ACT (1989).

170. See ENVIRONMENT H.K. 1992, *supra* note 155, at 21.

effect on the environment, as well as providing a central environmental complaint and inquiry service.<sup>171</sup>

The EPD has striven bravely against often overarching development pressures.<sup>172</sup> This struggle has resulted in some success, but has often placed the EPD at odds with other government departments and programs.<sup>173</sup> This confrontational stance has resulted in inadequate staffing and funding, thus jeopardizing the lofty goals set out in the White Paper.<sup>174</sup> In testimony to this fact, the EPD budget was revised in 1990 to about H.K. \$20 million (approximately U.S. \$2.6 million) less than the previous year's budget of H.K. \$294 million (approximately U.S. \$38.6 million).<sup>175</sup> It was promised, however, that the "EPD would still grow at the rate promised towards the end [of the previous] year, as long as enough new staff could be recruited."<sup>176</sup> Adequate staffing, however, may not be forthcoming.<sup>177</sup> In the meantime, predictions on environmental spending remain

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171. See *id.*; see also H.K. YEARBOOK, *supra* note 156, at 351.

172. "The threat of tougher [environmental] laws has raised hackles in Hong Kong where few are expected to welcome an erosion of the colony's tradition of laissez-faire government." Victoria McGlothren, *Hong Kong's Environmental Awakening Slow But Steady*, Reuters, Aug. 13, 1991, available in LEXIS, World Library, ASIAPC File. Environmental regulation in the colony will affect all sectors of the economy. *Id.* For example, "[p]olice . . . battled 400 farmers intent on driving their ducks and chickens to a government building in the bustling central business district. The action was to protest against a law [which would] prevent animal waste from polluting the colony's streams." *Id.*

173. See Jamie Allen, *Set in a Septic Sea*, FAR E. ECON. REV., Sept. 19, 1991, at 40, 40.

174. *Id.*

175. Jamie Allen, *No Paring Down of EPD Despite Spending Drop*, S. CHINA MORNING POST, Feb. 28, 1990, at 6. This budget reduction was directly related to unforeseen high costs associated with payments to farmers forced to close down their businesses as the result of the second stage of the North District's livestock waste control scheme. *Id.*

176. *Id.*

177. Worry over the possibility of staff shortages is well founded. The EPD has struggled to meet the tremendous regulatory tasks it has been assigned with an already overburdened staff. See Allen, *supra* note 173, at 40; see also American Consulate in Hong Kong, *Hong Kong—Environmental Projects*, 1992 National Trade Data Bank, Market Reports, May 20, 1992, available in LEXIS, ASIAPC Library, ALLASI File (noting that the colony's legislature has promised to provide only 22 of the 130 EPD staffers necessary to enforce cleanup of Hong Kong harbor).



optimistic,<sup>178</sup> although the focus appears to be on solid and liquid waste disposal systems.<sup>179</sup>

The EPD must also combat the population's mixed reaction regarding the environment: while the public is concerned about the severe environmental problems, it is (apart from a small group of activists) unmotivated to act. The source of this apathy is the decidedly laissez faire economic traditions of the colony. The EPD is addressing this problem by focusing attention on environmental education programs.<sup>180</sup> These efforts have combined with those of environmental nongovernmental organizations (NGOs) to encourage vital citizen support for environmental protection.

### C. Grassroots Movements, Green Organizations, and Envirotech

In spite of the Hong Kong population's transient mentality,<sup>181</sup> the colony's formerly free-spirited economy has been increasingly tamed, however gradually, by the efforts of a growing number of environmental NGOs.<sup>182</sup> These groups have been vehemently critical of flaws in the environmental regulatory system.<sup>183</sup> The government, at least indirectly, appears to have acknowledged some

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178. Specifically, "[i]n the next 5-10 years [counting from 1991] Hong Kong's environmental spending could equal USD 5 billion." American Consulate in Hong Kong, *Alert Report/Trade Opportunity: Selling Anti-Pollution Control Equipment and Technology to Hong Kong Government and Local Contractors*, National Trade Data Bank, Market Reports, Sept. 20, 1991, available in LEXIS, ASIAPC Library, ALLASI File.

179. *Id.* "Spending on pollution control is concentrated in two areas: (a) A territory-wide sewage collection, treatment and disposal system and (b) A territory-wide system to collect and dispose of solid waste." *Id.*

180. See ENVIRONMENT H.K. 1992, *supra* note 155, at 119-20; see also K.K. Chadha, *The Greening of Asia: Taking Longer than Expected*, Polymers & Rubber Asia, Predicasts, Apr. 1992, available in LEXIS, ASIAPC Library, ALLASI File ("The EPD and the Education Department have prepared a structured course on environmental protection which will be taught in schools. Hong Kong's universities have also started introducing 'green' courses and degrees, and this is raising environmentalists' hopes for a greener Hong Kong.").

181. See Edmonds, *supra* note 3, at 183; Pang Eng Fong, *supra* note 3, at 225.

182. See *supra* text accompanying note 18. "Although [Friends of the Earth's] 1,600 members are primarily from the expatriate community, other environmental organizations, such as Green Power and the Conservancy Association, have been more active in stirring up the consciences of the Hong Kong Chinese." John Thornhill, *Survey of Hong Kong*, FIN. TIMES, May 5, 1992, at 31.

183. NGOs have argued that the government has favored enticements over punitive measures, and so has "compromise[d] the integrity of the [environmental] legislation." Thornhill, *supra* note 182, at 31 (quoting Peter Illig, Director of Friends of the Earth Hong Kong). NGOs have also noted the EPD's poor performance in the area of environmental enforcement. In 1990, "the [EPD] received nearly 2,000 air pollution complaints. Prosecutions totaled 295." McGlothren, *supra* note 172.

of its shortcomings<sup>184</sup> and has enlisted the help of the private sector in coping with widespread environmental degradation.<sup>185</sup> Thus, as with Taiwan, the pollution control sector has been characterized as a high-profit opportunity for both domestic and foreign concerns.<sup>186</sup> Hong Kong, however, has been relatively cautious in its acceptance of organized, joint environmental efforts with trading partners such as the United States.<sup>187</sup>

#### D. Environmental Legislation

1. *Air Pollution.* The current goal of the Hong Kong government in the area of air quality protection is to "achieve . . . a set of air quality objectives for seven main urban air pollutants."<sup>188</sup> These pollutants are sulfur dioxide, suspended particulates, respirable suspended particulates (as a distinct fraction), nitrogen dioxide, carbon monoxide, ozone (and other photochemical oxidants), and lead.<sup>189</sup> The Air Pollution Control Ordinance (APCO)<sup>190</sup> is the

184. The EPD itself has confessed that "[i]n Hong Kong, most of the difficulties have not actually been with the private sector. They've mainly been with other governmental departments . . . that want to develop and maximize the land." See Karp, *supra* note 19, at 32 (quoting Robert Law, Deputy Director of the EPD). According to environmentalists, however, the EPD is not as forthcoming about the failures attendant with its renewed efforts at bettering the environment. See *Environmental Progress Report Issued After One of the Territory's Worst Disasters*, Int'l Envtl. Daily (BNA) (Oct. 9, 1992), available in LEXIS, Nexis Library, ALLWLD File [hereinafter *Environmental Progress Report BNA*].

185. This may be the only hope for the change needed to effect more sustainable development. A ranking official in Hong Kong's government maintains that "the public sector is doing all it can to protect the environment and it is now the private sector's turn." *Environmental Progress Report BNA*, *supra* note 184. At least one segment of the private sector, the NGOs, appears skeptical of the efforts of the business and private sectors on behalf of the environment. See Thornhill, *supra* note 182, at 31 ("The market will not solve the problem; the market is one of the problems. Pollution is one of the direct effects of the industrial process which functions in a market." (quoting Illig)).

186. The EPD has asked consulates for help in bringing American expertise to Hong Kong in such fields as the disposal of sludge, medical waste, and radioactive materials. See American Consulate in Hong Kong, *supra* note 177.

187. *Asia Unenthusiastic Over U.S. Joint Environment Proposals*, Agence France Presse, Feb. 25, 1992, available in LEXIS, Nexis Library, AFP File. Of the Asian countries approached in early 1992, only Hong Kong and Singapore had reacted with some enthusiasm to the United States-Asia Environmental Partnership, which aims at promoting technology transfer, fellowships, training, and joint infrastructure projects. *Id.* Even this interest, however, was tinged with caution. *Id.* (quoting a Hong Kong official to the effect that the EPD is "still studying the proposal and [is] not in the stage of taking any specific moves").

188. ENVIRONMENT H.K. 1992, *supra* note 155, at 49.

189. *Id.*

primary controlling piece of legislation for this medium. It is a sort of "enabling legislation," meaning that it provides a framework of powers from which the specific regulatory standards and limits [contained in subsidiary legislation] may later emerge."<sup>191</sup> Under the APCO, "the Governor in Council [is empowered], after consultation with the Environmental Pollution Advisory Committee (EPCOM), to declare any parts of Hong Kong as Air Control Zones (ACZs)."<sup>192</sup> Currently, ten ACZs exist.<sup>193</sup> Air quality goals for these zones are set out under the Air Pollution Control (Air Control Zone) (Declaration) (Consolidation) Order.<sup>194</sup> Industries using "specified processes" are then targeted for pollution control according to the established legal standards.<sup>195</sup> APCO specifies twenty-three manufacturing processes as having significant air pollution potential.<sup>196</sup> If a manufacturer employs one of these specified processes, it must obtain prior approval and proper licensing.<sup>197</sup> The factors relevant to licensing "are the capability of the applicant to employ the best practicable means to prevent the emission of noxious or offensive emissions, the impact of emissions on public health, and whether the emissions would cause non-attainment of any relevant [air quality

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190. Air Pollution Control Ordinance, LAWS OF HONG KONG ch. 311 (1983), as amended (1991).

191. Edward J. Epstein, Comment, *Air Pollution Control in Hong Kong: Back to Square One?*, 13 H.K.L.J. 365, 366 (1983).

192. H.K. YEARBOOK, *supra* note 156, at 355.

193. *Id.* Specifically, the zones are known as the Harbour ACZ, the Tsuen Wan-Kwai Chung ACZ, the Junk Bay ACZ, the Tolo ACZ, the South HK Island-Lamma ACZ, the Port Shelter ACZ, the Fanling-Sha Tau Kok ACZ, the Tuen Mun ACZ, the Yuen Long ACZ, and the Lantau ACZ. See ENVIRONMENT H.K. 1989, *supra* note 165, at 85.

194. Air Pollution Control (Air Control Zone) (Declaration) (Consolidation) Order, *found in* Air Pollution Control Ordinance (1983), LAWS OF HONG KONG ch. 311, § 7 (1987). As of 1991, six of the ACZs were reported as not in compliance with the Air Quality Objectives. See ENVIRONMENT H.K. 1992, *supra* note 155, at 63.

195. See H.K. YEARBOOK, *supra* note 156, at 356; see also Air Pollution Control (Specified Processes) Regulations (H.K. 192/87), REGULATIONS OF HONG KONG (1987); Air Pollution Control (Specified Processes) Regulations 1987 (Commencement) Notice (H.K. 345/87), REGULATIONS OF HONG KONG (1987); Air Pollution Control (Specified Processes) (Specification of Required Particulars and Information) Order (H.K. 343/87), REGULATIONS OF HONG KONG (1987).

196. ENVIRONMENT H.K. 1992, *supra* note 155, at 50. These are acrylates works, aluminum works, cement works, ceramic works, chlorine works, copper works, electricity works, gas works, iron and steel works, metal recovery works, mineral works, incinerators, petrochemical works, sulfuric acid works, tar and bitumen works, frit works, lead works, amines works, asbestos works, chemical incineration works, hydrochloric acid works, hydrogen cyanide works, and sulfide works. See ENVIRONMENT H.K. 1989, *supra* note 165, at 120-21.

197. See ENVIRONMENT H.K. 1992, *supra* note 155, at 50.

objective]."<sup>198</sup> A drawback of the licensing process is that a grandfather clause provides that all factories operating before the legislation took effect in 1987 are exempted from the licensing requirements.<sup>199</sup> As a result, recent figures reveal that, as of 1991, only 42 of a total of 146 specifiable factories were within legislative control.<sup>200</sup> Moreover, the exempted factories are not under any legal obligation to use the best available technology to control emissions and thus continue to pose an environmental threat.<sup>201</sup>

Enforcement of APCO is realized primarily through the use of "regular inspections of industrial and commercial premises . . . for compliance monitoring purposes and in response to complaints."<sup>202</sup> Complaints resulting in investigations numbered over 1,659 in 1991.<sup>203</sup> Enforcement of legislation governing mobile pollutants is pursued through the use of a series of monitoring stations placed at strategic locations throughout the colony to continuously measure ambient air quality.<sup>204</sup>

Details concerning the management of specific air pollution concerns are provided under other ordinances. Some of this legislation focuses on problems arising out of the colony's geography. Due to limited space and even more limited nonmountainous space, many factories are located at lower elevations, ensuring that chimney emissions impinge on residential areas that are predominantly located on higher ground.<sup>205</sup> The Air Pollution Control (Smoke) (Amendment) Regulations<sup>206</sup> and the Air Pollution Control (Furnaces, Ovens and Chimneys) (Installation and Alteration) (Amendment) Regulations<sup>207</sup> also cover stationary emissions. These require,

198. ENVIRONMENT H.K. 1989, *supra* note 165, at 86.

199. See ENVIRONMENT H.K. 1992, *supra* note 155, at 50-51.

200. See *id.*

201. H.K. YEARBOOK, *supra* note 156, at 356.

202. *Id.*

203. *Id.*

204. *Id.* at 363.

205. *Id.* at 351. It should be noted that a "micro-scale air pollution problem" has been created by Hong Kong's limited land space at lower elevations as well. Epstein, *supra* note 191, at 369 (citing HK Productivity Centre, *Air Pollution Control in Hong Kong*, 2 HONG KONG ENVTL. CONTROL BULL. 10 (1982)). The growing number of tall buildings with commercial, industrial, and residential uses has prevented the proper dispersion of emissions from factories. *Id.*

206. Air Pollution Control (Smoke) (Amendment) Regulations (H.K. 289/90), REGULATIONS OF HONG KONG (1990).

207. See Air Pollution Control (Furnaces, Ovens and Chimneys) (Installation and Alteration) (Amendment) Regulations (H.K. 261/87), REGULATIONS OF HONG KONG (1987); Air Pollution Control (Furnaces, Ovens and Chimneys) (Installation and Alteration) (Amendment) (No. 2)

among other things, submission of plans and specifications to the EPD prior to the installation or alteration of fuel-using equipment.<sup>208</sup> Vehicular emissions are currently covered by APCO<sup>209</sup> and the Road Traffic Ordinance,<sup>210</sup> the latter including provisions to limit pollution from vehicles. The availability of unleaded fuel in the colony<sup>211</sup> will facilitate the implementation of catalytic converter technology and increasingly stringent vehicle emissions standards.<sup>212</sup> The Air Pollution Control (Vehicle Design Standards) (Emissions) Regulations<sup>213</sup> presently require that the design of all light-duty vehicles<sup>214</sup> registered after January 1, 1992, comply with emissions standards as stringent or more stringent than those identified within the regulations.<sup>215</sup>

2. *Noise Pollution.* The Noise Control Ordinance<sup>216</sup> and seven related pieces of legislation<sup>217</sup> combine to help achieve the government's policy objective of combating environmental noise pollution. The high level of ambient noise in Hong Kong is attributable to many factors, including: "(i) a high-rise and high density living environment; (ii) the high volume of surface traffic; (iii) the prevalence of high-rise flatted factories; (iv) the close interface between noise sensitive premises and noise sources . . .; [and] (v) the almost incessant construction activities."<sup>218</sup> Currently, the legislation addresses noise pollution from construction, industrial, commercial, and neighborhood sources.<sup>219</sup> Industrial noise controls require that all imported machinery comply with established noise emission stan-

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Regulations (H.K. 282/87), REGULATIONS OF HONG KONG (1987).

208. H.K. YEARBOOK, *supra* note 156, at 356.

209. APCO was amended in 1991 to cover vehicle emissions. *Id.* at 355.

210. Road Traffic Ordinance, LAWS OF HONG KONG ch. 374 (1982), *as amended* (1993).

211. The availability of unleaded fuel is specifically provided for under Air Pollution Control (Amendment) (No. 2) Ordinance, LAWS OF HONG KONG ch. 311, § 26C (1991) (concerning unleaded petrol and the control of emission of air pollutants from motor vehicles).

212. H.K. YEARBOOK, *supra* note 156, at 356-57.

213. *See* Air Pollution Control (Vehicle Design Standards) (Emissions) Regulations (H.K. 134/91), REGULATIONS OF HONG KONG (1991).

214. This class of vehicles includes those that are diesel powered. H.K. YEARBOOK, *supra* note 156, at 356-57.

215. *See* Air Pollution Control (Vehicle Design Standards) (Emissions) Regulations, reg. 8, LAWS OF HONG KONG (1991).

216. Noise Control Ordinance, LAWS OF HONG KONG ch. 400 (1988), *as amended* (1992).

217. *See* ENVIRONMENT H.K. 1992, *supra* note 155, at 69.

218. ENVIRONMENT H.K. 1989, *supra* note 165, at 129-30. The colony's subtropical climate renders noise insulation expensive because of the resulting need to provide air conditioning. *Id.*

219. H.K. YEARBOOK, *supra* note 156, at 357.

dards.<sup>220</sup> For the control of construction noise, a permit system is used.<sup>221</sup> The permits generally limit the amount, time of use, and type (silenced where practicable) of equipment to be used.<sup>222</sup> Particularly with regard to percussive piling (use of pile drivers and the like), time limitations prohibit the use of such methods from 7:00 P.M.-7:00 A.M. and on Sundays and public holidays.<sup>223</sup> Noise from industrial or commercial premises is controlled mainly through the use of noise abatement notices. The issuance of these notices, which requires an abatement of the offending noise by a given date, is triggered by complaints to the EPD.<sup>224</sup> Lastly, neighborhood noise is managed by "the police . . . relying on subjective assessment."<sup>225</sup>

Development concerns may still trump the lofty goals of Hong Kong's noise control legislation. Large and economically important construction projects, such as the new airport at Chek Lap Kok and the fixed bridge at Lantau, may be granted exemption orders under the Noise Control Ordinance by the Governor in Council.<sup>226</sup>

3. *Water Pollution.* The Water Pollution Control Ordinance (WPCO)<sup>227</sup> closely follows the planning mechanism used in air pollution control<sup>228</sup> by establishing Water Control Zones (WCZs).<sup>229</sup> Water pollution legislation is thus enforced by the EPD

220. See 3.05 *Environmental Law: Building and Related Permits*, 1992 Business International, Investing Licensing and Trading, Dec. 1, 1992, available in LEXIS, ASIAPC Library, HKONG File.

221. See Noise Control Ordinance, LAWS OF HONG KONG ch. 400, § 9 (1988), as amended (1992).

222. H.K. YEARBOOK, *supra* note 156, at 357.

223. *Id.*

224. *Id.* at 358.

225. ENVIRONMENT H.K. 1992, *supra* note 155, at 70.

226. See *id.* at 70-71; see also Noise Control Ordinance (Exemption from Section 6(1) and (2)) (Chek Lap Kok) Order (H.K.358/91), REGULATIONS OF HONG KONG (1991) (exempting site formation and construction work from restrictions on carrying out work other than percussive piling during restrictive hours), Noise Control Ordinance (Exemption from Section 6(1) and (2)) (Lantau Fixed Crossing) Order (H.K.362/91) REGULATIONS OF HONG KONG (1991) (exempting site formation and construction work from restrictions on carrying out work other than percussive piling during restricted hours).

227. Water Pollution Control Ordinance, LAWS OF HONG KONG ch. 358 (1980), as amended (1992).

228. Epstein, *supra* note 191, at 367.

229. ENVIRONMENT H.K. 1992, *supra* note 155, at 103. As of 1991, the areas containing the heaviest pollutants were not designated WCZs because of staff shortages. *Id.* at 105. To remedy this serious omission, the government plans to declare the Eastern Buffer and Western Buffer as WCZs in 1993, and Victoria Harbor as a WCZ sometime thereafter. *Id.*

in relation to effluent discharges in these zones.<sup>230</sup> The quality of water appropriate for certain uses, such as commercial fishing, drinking, or recreational activity, is first assessed; later, water quality objectives are defined for each of the zones.<sup>231</sup> Discharges into these waters are controlled by a licensing system.<sup>232</sup> Presently, six WCZs have been designated, though a total of ten are planned for the entire region.<sup>233</sup> As a result, only 90 percent of the colony is within the purview of WPCO.<sup>234</sup> A modicum of transparency was given to the effluent standards currently required under WPCO by the issuance of a Technical Memorandum.<sup>235</sup> The Memorandum "allow[ed] factories to discharge effluents containing more non-toxic . . . waste than the government's design standard for its sewage disposal works."<sup>236</sup> It also introduced charges for factories unable to meet the government standard in order to offset effluent treatment costs in the public sewer works.<sup>237</sup> Recently, the Water Pollution Control (Amendment) Ordinance removed many of the compliance loopholes associated by WPCO by making it illegal "to discharge any noxious or poisonous matter into the waters of Hong Kong notwithstanding that there may not have been a water control zone declared."<sup>238</sup> Extending the reach of environmental laws beyond the colony's shores, the Dumping at Sea Act<sup>239</sup> requires that a permit must be obtained before any materials unsuitable for reclamation can be disposed of at authorized dumping grounds within the territorial waters of Hong Kong.<sup>240</sup>

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230. *Id.*

231. See, e.g., Statement of Water Quality Objectives (Deep Bay Water Control Zone) (H.K. 381/90), REGULATIONS OF HONG KONG (1990); Statement of Water Quality Objectives (Mirs Bay Water Control Zone) (H.K. 382/90), REGULATIONS OF HONG KONG (1990); Southern Water Control Zone Statement of Water Quality Objectives (H.K. 211/88), REGULATIONS OF HONG KONG (1988); Tolo Harbour and Channel Water Control Zone Statement of Water Quality Objectives for Watercourses (H.K. 172/88), LAWS OF HONG KONG (1988).

232. ENVIRONMENT H.K. 1992, *supra* note 155, at 104. Households that discharge waste into a sewer and areas that do not fall within WCZs are exempted from the permit requirement. *Id.*

233. *Id.* at 105.

234. H.K. YEARBOOK, *supra* note 156, at 354.

235. See ENVIRONMENT H.K. 1992, *supra* note 155, at 104.

236. *Id.*

237. *Id.*

238. Water Pollution Control (Amendment) Ordinance (Amendment Ordinance) (H.K. 67/90), ORDINANCES OF HONG KONG (1990); see Ferheen Mahomed, *A Foreign Investor's Guide to the Environmental Regime of Hong Kong*, 28 SAN DIEGO L. REV. 787, 799 (1991).

239. The United Kingdom Dumping at Sea Act of 1974 was applied to the colony via a 1975 order. Dumping at Sea Act 1974 (Overseas Territories) Order 1975.

240. H.K. YEARBOOK, *supra* note 156, at 27.

Because much of Hong Kong consists of land reclaimed from the sea, any plans to further the colony's water pollution controls will entail long-term, comprehensive planning, taking into account future land use and development.<sup>241</sup> Without such forethought, changes in marine flow patterns resulting from reclamation projects will impact natural waste assimilation capabilities and increase the effects of water pollution.<sup>242</sup>

4. *Toxic Substances Pollution.* The treatment of toxic waste has been targeted as a priority by Hong Kong's Governor.<sup>243</sup> The regulation of these wastes is set out under the Waste Disposal Ordinance (WDO).<sup>244</sup> Chemical waste is specifically controlled under the Waste Disposal (Chemical Waste) (General) Regulation, the violation of which is treated as a major offense.<sup>245</sup> The Waste Disposal Regulation targets such chemical wastes as toxic heavy metals, organic solvents, and hazardous acids and alkalis. The Regulation also enumerates specific criteria for proper packaging, labeling, storage, collection, and disposal of the waste, and requires chemical waste producers to register with the EPD.<sup>246</sup> Hong Kong will utilize a "consignment record system" to trace the movement of the waste for "cradle to grave" control.<sup>247</sup> An integrated Chemical Waste Treatment Center (CWTC), which opened in June 1993 at a cost of U.S. \$166 million, contracts with local industry to provide treatment facilities for those for whom in-house treatment is impracticable (as is frequently the case).<sup>248</sup> The CWTC will also enable

241. See ENVIRONMENT H.K. 1992, *supra* note 155, at 110.

242. *Id.*

243. See Governor Pledges More than \$900 Million to Program for Treating Sewage, Toxic Waste, 15 Int'l Env't. Rep. (BNA) 674 (Oct. 21, 1992) [hereinafter *Governor Pledges BNA*].

244. Waste Disposal Ordinance, LAWS OF HONG KONG ch. 354 (1987), as amended (1992).

245. Waste Disposal (Chemical Waste) (General) Regulation (H.K. 20/92), REGULATIONS OF HONG KONG (1992); see also ENVIRONMENT H.K. 1992, *supra* note 155, at 87. The regulation currently provides for a maximum fine of H.K. \$200,000 (approximately U.S. \$26,000) and six months imprisonment. See *id.* at 83.

246. See *id.* at 82-83.

247. See *id.* "Cradle to grave" control means that the EPD will be able to exercise control over chemical waste from its source to its point of disposal. For a reference to comparative United Kingdom approaches, see Doolittle, *supra* note 162, at 5, § 2.2, UK-7 to -8 (describing recent United Kingdom statutory reforms which mandate licenses for waste disposal and long-term liability for waste disposal sites, thereby ensuring that "industrialists will have to accept cradle-to-grave responsibility for their waste"). *Id.* at 8.

248. See *Asia's First Chemical Waste Treatment Center Opens*, Xinhua General News Service, June 2, 1993, available in LEXIS, ASIAPC Library, Xinhua File. The CWTC will treat an estimated 100,000 tons of chemical waste from roughly 9,000 producers in Hong Kong each year.



Hong Kong to comply with its obligations under the International Convention for the Prevention of Marine Pollution from Ships (MARPOL),<sup>249</sup> as it will be able to receive oily and noxious wastes from ships using Hong Kong's harbor.<sup>250</sup>

5. *Other Environmental Problems.* Hong Kong's fundamental environmental laws expand to address new and complex problems primarily through the use of subsidiary legislation. Important legislation that was not discussed above includes the Public Health and Municipal Services Ordinance<sup>251</sup> (providing, among other things, for the control of nuisances caused by emissions of dust and fumes and the designation of bathing beaches); the Radiation Ordinance<sup>252</sup> (controlling the use and disposal of radioactive substances); the Fisheries Protection Ordinance<sup>253</sup> (prohibiting the use of explosives and poisons for fishing); the Summary Offenses Ordinance<sup>254</sup> (containing provisions relating to littering offenses); the Town Planning Ordinance<sup>255</sup> (providing control over land use); the Country Parks Ordinance<sup>256</sup> (restricting nuisances and development within designated country parks); the Wild Animals Protection Ordinance<sup>257</sup> (restricting the capture and hunting of certain wild animals); and the Buildings Ordinance<sup>258</sup> (authorizing the Building Authority to require that occupants meet specified conditions for compliance with environmental regulations).

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*Id.*; see generally ENVIRONMENT H.K. 1992, *supra* note 155, at 87 (describing the development of the CWTC, its construction, and purposes).

249. International Convention for the Prevention of Pollution from Ships, Nov. 2, 1973, reprinted in 12 I.L.M. 1319 (1973), with protocol, Feb. 17, 1978, reprinted in 17 I.L.M. 546 (1978).

250. See ENVIRONMENT H.K. 1992, *supra* note 155, at 87-88.

251. Public Health and Municipal Services Ordinance (1960), amended by (H.K. 336/92), LAWS OF HONG KONG ch. 132 (1992).

252. Radiation Ordinance (1957), LAWS OF HONG KONG ch. 303 (1957).

253. Fisheries Protection Ordinance (1962), amended by (H.K. 68/87, 3/88), LAWS OF HONG KONG ch. 171 (1987).

254. Summary Offenses Ordinance (1933), amended by (H.K. 33/89), LAWS OF HONG KONG ch. 228 (1989).

255. Town Planning Ordinance (1939), amended by (H.K. 10/91), LAWS OF HONG KONG ch. 131 (1991).

256. Country Parks Ordinance (1976), amended by (H.K. 326/92), LAWS OF HONG KONG ch. 208 (1992).

257. Wild Animals Protection Ordinance (1976), amended by (H.K. 182/92), LAWS OF HONG KONG ch. 170 (1992).

258. Buildings Ordinance (1955), replaced by (H.K. 72/80), amended by (H.K. 77/92), LAWS OF HONG KONG ch. 123 (1992).

Another major weapon in the battle against environmental degradation is the use of environmental impact assessments (EIAs). These reports may be required before the start of major government and private development projects and are reviewed by EPCOM.<sup>259</sup>

#### E. Future Concerns

Hong Kong's impending merger with the P.R.C. has created an interesting dilemma; while there is now an incentive for the two governments to work together on environmental issues, there are also serious problems regarding pre-1997 impacts of transboundary environmental projects. The case of the P.R.C.'s Daya Bay Nuclear Plant, located in close proximity to the Hong Kong-Chinese border, is a perfect example of the problems which cannot be solved by further legislation on the part of Hong Kong.

Hong Kong's repeated attempts to provide its citizens with solid evidence that the Daya Bay plant is safe and poses no hazard have failed, leaving the colony with no recourse but to commission consulting studies for "an independent and expert evaluation of the environment and safety impact of the plant."<sup>260</sup> In the same vein, the possibility that the colony's effluent discharges may enter Chinese national waters must also be considered by Hong Kong environmental planners. One EPD official was recently quoted as saying that "[w]e have to ensure that anything we do does not affect [the P.R.C.]."<sup>261</sup>

### IV. SOUTH KOREA

#### A. History

Korea's history as a unified nation began in the tenth century.<sup>262</sup> Following a long period of isolationism, Korea was colonized by Japan in 1910.<sup>263</sup> Korea was liberated from Japanese colonization by the United States and the Allied powers at the conclusion of

259. See ENVIRONMENT H.K. 1992, *supra* note 155, at 21-22, 133; see also Mahomed, *supra* note 238, at 813-14.

260. Roda Mushkat, *The Daya Bay Nuclear Plant Project in the Light of International Environmental Law*, 7 UCLA PAC. BASIN L.J. 87, 107 (1990) (footnotes omitted).

261. *Hong Kong: Environmental Protection Department Considers a Privatized Sewage Treatment and Disposal Scheme*, Reuter Textline, Construction News, May 5, 1989, available in LEXIS, World Library, ASIAPC file.

262. See LEE, *supra* note 5, at 101-03.

263. See Kyong-Dong Kim, *The Distinctive Features of South Korea's Development*, in IN SEARCH OF AN EAST ASIAN DEVELOPMENT MODEL, *supra* note 3, at 197, 198.

World War II.<sup>264</sup> Following the demarcation of North and South Korea at the Thirty-eighth Parallel, the United Nations in 1948 fostered the establishment of the Republic of Korea in the southern region.<sup>265</sup> Within one month, the People's Democratic Republic of Korea was formally established in the north under Soviet tutelage.<sup>266</sup>

After the end of the Korean War,<sup>267</sup> the United States sponsored the reinvigoration and reconstruction of the South Korean economy, "pa[ying] for 70 percent of South Korea's imports and account[ing] for fully 80 percent of fixed capital formation."<sup>268</sup> The provision of such a stable market provided the basis for South Korea's fledgling industries and set the stage for heavy industrialization "led by manufacturing, and manufacturing [led] by exports."<sup>269</sup> The South Korean government fostered this economic plan through the "concentration of production and distribution of commodities and services by [conglomerates called] *chaebols*."<sup>270</sup> As a result, a social order emerged from the predominance of a few companies, assuring that "economic and political power [was concentrated] in the hands of the *chaebols*, [which were essentially managed by the] affluent urban class and technocracy."<sup>271</sup>

The South Korean system of government is founded on the democratic principle of the separation of powers.<sup>272</sup> "[l]egislative authority is vested in the National Assembly, the President heads the administrative branch, and the Supreme Court controls the judicial branch."<sup>273</sup> The government is centralized at the national level,<sup>274</sup>

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264. *Id.* at 199.

265. *See* KOREA: PAST AND PRESENT, *supra* note 3, at 79.

266. *See id.* at 79-80.

267. The Korean War lasted from 1950 to 1953. *See* LEE, *supra* note 5, at 380.

268. GIBNEY, *supra* note 7, at 240.

269. Kyong-Dong Kim, *supra* note 263, at 199.

270. Jong-dall Kim, *The Political Economy of Energy-Corporate-Urban Integration in South Korea* 11 (1991) (unpublished Ph.D. dissertation, University of Delaware). *Chaebols* are "family-owned and controlled large business groups which include a wide range of different networked companies." *Id.* at 8 n.4. *Chaebols* have also been described as "large diversified business groups." ALICE H. AMSDEN, *ASIA'S NEXT GIANT: SOUTH KOREA AND LATE INDUSTRIALIZATION* 39 (1989).

271. Jong-dall Kim, *supra* note 270, at 12.

272. *See* MINISTRY OF COURT ADMINISTRATION, *JUDICIAL SYSTEM OF KOREA: SUPREME COURT OF KOREA* 4 (1991) [hereinafter *SUPREME COURT OF ROK*]; Tae Hee Lee & Norbert W. Sugayan, Jr., *Environmental Law of South Korea*, in *INT'L ENVTL. LAW AND REG.* § 1.1, at S.Kor-1 to -5 (J. Andrew Schlickman et al. eds., 1991). "In actual practice, however, the administrative branch . . . dominates the national political landscape." *Id.* at § 1.1, S.Kor-5.

273. Tae Hee Lee & Sugayan, *supra* note 272, § 1.1, at S.Kor-5.

and the present legal system is heavily influenced by the civil law traditions of Germany and Japan.<sup>275</sup>

One factor which has bolstered the government's efforts in economic development is South Korea's ethnically homogeneous population.<sup>276</sup> However, rapid industrial growth has not merely boosted the economy; it has also contributed to the depletion of South Korea's finite natural resources and to the degradation of the country's environment.<sup>277</sup>

## B. Regulatory Authorities

"The Korean government and people ignored the problem [of the degradation of the environment] until the 1980's despite worldwide concern for pollution because they were too busy concentrating on developing the economy and meeting basic needs."<sup>278</sup> Thus, South Korea's Office of Environmental Administration was not upgraded to full ministry status until 1990.<sup>279</sup> The Ministry of the Environment (MOE) is presently comprised of internal bureaus<sup>280</sup> which delegate

274. *Id.* South Korea's Local Autonomous Act was revised in January 1990 to allow for the election of local assemblies, giving local autonomous authorities a modicum of legislative control regarding regional issues. *Id.*

275. *Id.* § 1.2, at S.Kor-5. South Korean law is, for the most part, embodied in a statutory code. *See generally* Pōp Chōn [CODE OF LAWS] (Sang Won Cho ed., Seoul 1992) [hereinafter CODE OF LAWS (in Korean)]. The comprehensive Civil Code of South Korea came into effect January 1, 1960, and is considered to be the "primary source of the law." Tae Hee Lee & Sugayan, *supra* note 272, § 1.2, at S.Kor-6. Case law is not considered binding on Korean courts; however, "court rulings, particularly those of the Supreme Court, carry considerable weight." *Id.*

Note: no global, standardized system of English transliteration currently exists for the Korean language. Therefore, in this Note, transliterations from other sources have not been changed. Where the author has felt it necessary to use his own transliterations, he has employed the McCune-Reischauer System, currently used by the United States Library of Congress, Orientalia Division, Korean Unit.

276. WORLD RESOURCES INSTITUTE, 1993 INFORMATION PLEASE ENVIRONMENTAL ALMANAC 474 (1993).

277. *See id.* at 474. Due to its mountainous terrain, South Korea's population is highly concentrated within a small portion of the country's land. *Id.* The need for land to accommodate this concentrated population has led to recent losses of arable land. *See* U.N. ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC, STAT. Y.B. FOR ASIA AND THE PAC., 1990 at 211, U.N. Sales No. E/F.91.II.F.1 (1990).

278. *South Korea*, 288 Int'l Env't. Rep. (BNA) 59 (Nov. 1990) [hereinafter *South Korea BNA*].

279. *Id.*

280. MOE is subdivided into various bureaus, including the Air Quality Management Bureau, the Water Quality Management Bureau, the Solid Waste Management Bureau, and the Engineering and Technology Bureau. *Id.* at 63.

most environmental duties, as does Taiwan's EPA,<sup>281</sup> to various regional subunits which are in turn subdivided into departments.<sup>282</sup> The result is a network of related entities which implement MOE's policies with difficulty and are frequently hindered by a general lack of cooperation from other ministries.<sup>283</sup> In spite of the obstacles attendant with its infancy, MOE draws support for its policy goals from many associated nonprofit public corporations, as well as from private entities with which MOE has established close ties.<sup>284</sup> South Korea's Ministry of Science and Technology (MOST) also coordinates and supports a host of public institutions that conduct work which complements that of MOE.<sup>285</sup> Lastly, a growing number of smaller, generally unaffiliated organizations and institutions are available for both cross-media and specialized environmental projects.<sup>286</sup>

Many of the institutions heading and comprising the support system for South Korea's environmental policy implementation are relative latecomers to the environmental management scene, as compared with institutions in the other Dragons. Hopefully foreshadowing positive reform, however, the South Korean government is in the process of reorganizing both the executive branch and certain

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281. See *supra* text accompanying notes 45-49.

282. Tae Hee Lee & Sugayan, *supra* note 272, § 1.4, at S.Kor-8. "Each regional MOE office consists of a Planning Department, Measurement and Analysis Department, and a Directives Department." *Id.* Local government authorities typically support sewer, environmental, and green belt departments. *Id.* § 1.4, at S.Kor-8 to -9. "Green belts" are environmental buffer zones encircling major metropolitan areas to reduce pollution and to prevent runaway urban expansion. *Id.*

283. See *South Korea BNA*, *supra* note 278, at 59.

284. For examples of the more than eighteen public and private organizations active in the environmental field, see *Environmental Protection Rules: Toxic Substances and Recycling*, E. ASIAN EXECUTIVE REP., May 15, 1993, at 8 [hereinafter *Environmental Protection Rules*]. A crucial but relative newcomer to these support agencies is the Central Environmental Disputes Coordination Commission. Established in July 1991, the Commission has the authority to mediate environmental pollution damage claims. See MINISTRY OF ENVIRONMENT, REPUBLIC OF KOREA, NATIONAL REPORT OF THE REPUBLIC OF KOREA TO UNCED 1992, at 71 (1992) [hereinafter *KOREA UNCED REPORT*].

285. MOST coordinates the activities of the Korea Advanced Institute of Science and Technology and the Korea Ocean Research and Development Institute (a state-financed public institute supporting the work of more than 430 researchers). *Environmental Protection Rules*, *supra* note 284, at 8.

286. These include the Korea Environmental Measuring Association, the Korean Society of Noise and Vibration Engineers, the Korean Toxic Chemical Management Association, the Environmental Policy Research Institute, the Korea Air Pollution Research Association, and the Korea Society of Water Quality. See *id.*; see also information on grassroots organizations, *infra* text accompanying notes 310-15.

ministries in order to facilitate consensus building and cooperation in solving environmental problems.<sup>287</sup>

The predecessor of South Korea's MOE was a troubled and somewhat ineffectual Environmental Administration (EA), established in 1980 in an attempt to orchestrate environmental duties that were then spread out "among a host of ministries and agencies."<sup>288</sup> At the time, an aura of environmental concern surrounded the new EA, enhanced by the addition in the Constitution of the Fifth Republic of the right to a clean environment.<sup>289</sup> Closer scrutiny of this political veil revealed that, "[s]tructurally, [EA] was organized to deal primarily with pollution problems."<sup>290</sup> Thus, like the EPD in Hong Kong,<sup>291</sup> EA for the most part left nonpollution control issues, such as those concerned with parks and wildlife, to other divisions of the government.<sup>292</sup> The primary factor diluting EA's political effectiveness was its status as a subordinate division of the Ministry of Health and Social Affairs (MHSA).<sup>293</sup> The EA stood "at the low end of the bureaucratic pecking order with respect to prestige, influence, and the power to move events."<sup>294</sup>

287. *Environmental Trends in Korea*, E. ASIAN EXECUTIVE REP., Aug. 15, 1992, available in LEXIS, Nexis Library, ALLWLD File.

288. See Dong-Gun Byun, *Development and Environment in Less Developed Countries: With Special Emphasis on the Economic Growth Policy vs. Environmental Problems in Korea* 246 (1983) (unpublished Ph.D. dissertation, State University of New York (Buffalo)). Superficially, it appeared that EA was faced with the monumental task of administering environmental activities spread out among the Ministry of Construction (land and water concerns), the Ministry of Home Affairs (forest and nature preservation), the Ministry of Energy and Resources (underground resource exploitation and preservation), the Ministry of Science and Technology (providing personnel for resource management and surveys), the Ministry of Health and Social Affairs (public health related to pollution), and the Ministry of Agriculture (pesticide use control). See *id.* In actuality, however, EA concentrated primarily on environmental research and training, and air and water pollution control. See *id.* at 248.

289. KOREA (REPUBLIC OF) CONST. ch. II, art. 33 (1980). The Constitution of the Fifth Republic has been superseded by the Constitution of the Sixth Republic (1987-present), which has retained the right to a clean environment. KOREA (REPUBLIC OF) CONST. ch.II, art. 35 (1987).

290. Dong-Gun Byun, *supra* note 288, at 248.

291. See *supra* text accompanying notes 155-61.

292. See Dong-Gun Byun, *supra* note 288, at 248. Much of the environmental administration at the local level was implemented by the "Pollution Prevention Section (overall pollution control), Automobile Section (traffic pollution), and the Medical and Pharmaceutical Section (toxic materials) of local government[s]." ASIAN DEVELOPMENT BANK, ENVIRONMENTAL LEGISLATION AND ADMINISTRATION: BRIEFING PROFILES OF SELECTED DEVELOPING MEMBER COUNTRIES OF THE ASIAN DEVELOPMENT BANK 32 (ADB Environment Paper No. 2, May 1988).

293. See Dong-Gun Byun, *supra* note 288, at 248.

294. *Id.* at 247.

The promotion of the EA to MOE in 1990 gave the appearance that the South Korean government was moving towards a focused answer to the problem of diluted environmental responsibility.<sup>295</sup> These actions, however, likely stemmed from growing public discontent over environmental issues rather than the result of critical introspection. Indeed, "[t]he government hope[d] to pre-empt any possible attempts by social activists and a feisty parliamentary opposition from taking up the cudgels on the environment issue."<sup>296</sup>

Presently, the MOE is primarily responsible for enforcement of environmental legislation.<sup>297</sup> Much of this responsibility, however, remains delegated to regional offices and local governments.<sup>298</sup> The MOE also retains, under the Governmental Organization Act,<sup>299</sup> "general jurisdiction over all environmental issues,"<sup>300</sup> and "may publish administrative rules for the interpretation of environmental laws and [also] follow informal, and at times *unwritten and unpublicized*, government policies relating to environmental issues in South Korea."<sup>301</sup> The reality, however, is that despite this nominal overall responsibility, specific environmental responsibility is still distributed among different ministries. This necessitates inter-ministerial coordination through an Environmental Preservation Committee when "problems arise that should be solved through inter-ministrial [sic] consultation."<sup>302</sup> In addition, the regulatory policy trend in South Korea favors industrial concerns.<sup>303</sup>

The MOE is frequently the scapegoat for any number of environmental mishaps as the media considers the environmental ministry, and not other ministerial perpetrators, responsible for

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295. See South Korea BNA, *supra* note 278, at 59.

296. *Id.*

297. Tae Hee Lee & Sugayan, *supra* note 272, § 1.5, at S.Kor.-9.

298. *Id.*

299. Chông Pu Jo Jik Pöp [Governmental Organization Act] (Organic Laws of Agencies), L. No. 4371 (as amended May 31, 1991), CODE OF LAWS (in Korean), *supra* note 275, at 401.

300. Tae Hee Lee & Sugayan, *supra* note 272, § 1.4, at S.Kor.-8.

301. *Id.* (emphasis added).

302. KOREA UNCED REPORT, *supra* note 284, at 71. The Environmental Preservation Committee is chaired by the Prime Minister and is composed of the Ministers of Finance, the Economic Planning Board, Trade and Industry, Construction, Public Health and Social Services, and the Environment. *Id.*

303. See *Environmental Trends in Korea*, *supra* note 287, at 8. According to the Minister of Trade and Industry, a new Environmental Industrial Policy is aimed at, *inter alia*, "minimizing the adverse effects international environmental regulations will have on domestic industries [and] fostering an environment that preserves industry while restructuring existing industries." *Id.*

environmental problems.<sup>304</sup> Unfortunately, the MOE has no power to take action to prevent these mishaps from occurring. For example, developers need only consult the MOE before a construction project is commenced.<sup>305</sup> Postconsultation action by the MOE is not authorized.<sup>306</sup>

While the MOE has little power to prevent environmental problems, it has been increasingly condemned by the public as the population's awareness of environmental dangers increases. The public, however, is not cognizant of its own role in the problem; for example, South Korean households produce more waste than American or Japanese households.<sup>307</sup> Clearly, increased environmental education<sup>308</sup> is needed to combat the impending drain on waste management personnel and funds and to create a grassroots call for legal reform that will enable the MOE to be a major player in all ministry activities. The South Korean government has made guarded reference to the inadequacy of environmental education programs and the need for change in the form of added resources and early intervention.<sup>309</sup> Realization of these problems will hopefully be the first step towards building consensus for increased government support.

### C. Grassroots Movements, Green Organizations, and Envirotech

The growing number of environmental grassroots organizations is disguised by the appearance of South Korean complacency with regard to environmental issues. Very little is mentioned in the foreign media about the specific efforts of South Korean nongovernmental organizations.<sup>310</sup> Moreover, the small budgets and scale of these entities requires that they focus their work on the multifarious problems of South Korea's fast-paced development. Still, as in the

304. Yuchol Nam, *South Korea: Development Comes First*, FAR E. ECON. REV., Oct. 29, 1992, at 34.

305. *Id.*

306. *Id.*

307. *Environmental Trends in Korea*, *supra* note 287, at 8.

308. The South Korean government has already targeted "public awareness of environmental conservation" and "environmental education at all school levels" as areas for a concerted government effort. *Environmental Trends in Korea*, *supra* note 287, at 8. As a result, "[e]nvironmental education includes not only the education at schools but also the educational efforts by the media and at the workplace." KOREA UNCED REPORT, *supra* note 284, at 88.

309. *Id.* at 88-89.

310. See, e.g., Yuchol Nam, *supra* note 304, at 38 (mentioning briefly the activities and growing number of "pressure" or "activist" groups).



previously described Dragons, nongovernmental environmental organizations represent a formidable policy-influencing force and unofficial pollution watchdog.

The formation of these environmental groups dates from around the late 1960s and was incited largely by the severe impact *chaebols* had on the day-to-day lives of bordering neighborhoods.<sup>311</sup> The citizen environmental movement then evolved in the 1980s from a set of localized organizations to a "more militant and organized" movement with important links to labor and peace groups.<sup>312</sup> Recently, the South Korean environmental movement has ventured into the international sphere through representation at the Global Forum that was held in conjunction with the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro.<sup>313</sup> The Korean Anti-Pollution Movement Association (KAMA) headed the South Korean citizens' delegation to this conference.<sup>314</sup> Special mention should also be made of the Citizen's Movement Association for the Banishment of Pollution, the Christian Social Affairs Institute, the South Korea Pollution Affairs Institute, and the Green Association, as Korea's largest pro-environment lobbying groups.<sup>315</sup>

The influence of popular movements has also been felt in South Korea's bastions of development, the *chaebols*. The existence of groups such as the Industrial Complex Preservation Association, which is committed to solving environmental problems related to industrial complexes and to preserving the natural environment, and the Korean Environment Clean-up Association, which promotes sewage disposal technology,<sup>316</sup> has helped spur efforts to liberalize

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311. See Seong Dan Lee, *South Korea: A Case of Environmental Doom*, KOREA REP., Winter 1992-93, at 10, 13.

312. *Id.* at 13.

313. *Id.* For a list of participants, see WHO IS WHO AT THE EARTH SUMMIT: RIO DE JANEIRO 1992, at 315-18 (1992).

314. Seong Dan Lee, *supra* note 311, at 13. "KAMA believes that environmental problems emanate from the contradictions of the existing social structure, and that they can therefore be redressed by a movement for social change." *Id.*

315. Tae Hee Lee & Sugayan, *supra* note 272, § 4.2, at S.Kor-25. Other citizen groups prominent in the environmental arena include The Korean Nature Preservation Association (providing research on the protection of natural resources); the Ulsan Environment Preservation Association (advocating protection of the natural environment and the living environment in Ulsan, South Korea); and the Environmental Education Association (promoting environmental preservation through national education). See KOREA UNCED REPORT, *supra* note 284, at 90.

316. Industrial Complex Preservation Association, 187-5 Ku Po 2 dong, Puk-gu, Busan; Korean Environment Clean-up Association, 35-1 Song buk-dong 1 ga, Söng buk-gu, Seoul.

imports of all pollution control equipment and increase spending on environmental projects. The pollution control market, about 73 percent of which was previously dominated by Japanese manufacturers, may shift towards American industry so as to reduce the Korean trade deficit with Japan.<sup>317</sup>

#### D. Environmental Legislation

1. *Air Pollution.* The overarching provisions of the Environmental Protection Act (EPA) include the Basic Environmental Policy Act (BEPA),<sup>318</sup> which stipulates the controls governing the various topics covered in this Note. In the area of air quality control, the Atmospheric Environment Preservation Act (AEPA) provides for "permissible emission standards" to be established by the MOE.<sup>319</sup> The Minister of Environment is authorized to set these standards under Article 8 of AEPA. A national standard is established with the provision that stricter standards may be applied on a regional basis.<sup>320</sup> Further flexibility is provided by authorizing the MOE to establish permissible emission standards where new discharging equipment is installed so as to ensure compliance with regional standards.<sup>321</sup>

To aid in the control of stationary sources of pollution, the AEPA requires that permits be issued prior to the use of new emissions discharging equipment.<sup>322</sup> The permit system mandates that inspections be performed before permission is granted to operate discharge equipment.<sup>323</sup> The inspections are performed only by firms registered with the MOE.<sup>324</sup>

Source for addresses: Korean Embassy.

317. See *Cleaning Up Korea: Pollution Control Market Expands*, E. ASIAN EXECUTIVE REP., July 1990, at 8, 24. South Korean companies currently suffer from an inability to produce highly sophisticated pollution control equipment. This has led some Korean manufacturers to sign technology transfer agreements with foreign firms. *Id.* at 24.

318. Hwan Kyŏng Chŏng Cháek Ki Bon Pŏp [Basic Environmental Policy Act] L. No. 4257 (Aug. 1, 1990), amended by L. No. 4492 (Dec. 31, 1991).

319. See Tae Gi Hwan Kyŏng Po Chŏn Pŏp [Atmospheric Environment Preservation Act] ch. II, art. 8, L. No. 4262 (Aug. 1, 1990), amended by L. No. 4389 (May 31, 1991).

320. These standards cover roughly fifty different categories of pollutants. Tae Hee Lee & Sugayan, *supra* note 272, § 2.2, at S.Kor-12.

321. *Id.*

322. See Atmospheric Environment Preservation Act, ch. II, art. 10.

323. Tae Hee Lee & Sugayan, *supra* note 272, § 2.2, at S.Kor-12.

324. *Id.*

Enforcement measures under the AEPA include the issuance of an improvement order for a violation of a permissible emission standard.<sup>325</sup> The MOE can require the suspension of business operations of the entity or of a portion of emission facilities if there is noncompliance with the improvement order.<sup>326</sup> The MOE is also authorized to impose sanctions such as the transfer of the infringing facilities (if improvement is impracticable),<sup>327</sup> the charging of an emission penalty,<sup>328</sup> and revocation of a discharge permit.<sup>329</sup>

To combat pollution from mobile emissions sources, the "MOE may issue an order charging a fee for or limiting fuel consumption whenever [it deems] this is . . . necessary to prevent air pollution."<sup>330</sup> More specifically, it is authorized under AEPA to limit the manufacture, sale, or use of any type of fuel that exceeds established sulfur content standards.<sup>331</sup> Improvement orders may also be issued.<sup>332</sup> Accordingly, starting in January 1988 the MOE required the installation of catalytic converters and the use of unleaded fuel in all new passenger cars.<sup>333</sup> In the case of severe pollution conditions, "the MOE may request the local governor to issue orders restricting automobile use."<sup>334</sup> All automobile manufacturers (foreign and domestic) are required to meet permissible emission standards for carbon monoxide, smoke, hydrocarbons, and nitrogen oxides.<sup>335</sup>

2. *Noise Pollution.* The regulations for noise pollution are essentially the same as those governing air pollution except that emissions charges are not imposed.<sup>336</sup> The Noise and Vibration Control Act sets the standards for allowable noise levels in residential areas.<sup>337</sup> It also authorizes local government authorities to designate

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325. Atmospheric Environment Preservation Act, ch. II, art. 16 (order of improvement).

326. *Id.* ch. II, art. 17 (order, etc., to suspend operation).

327. *Id.* ch. II, art. 18 (order, etc., of transfer of facilities).

328. *Id.* ch. II, art. 19 (emission penalty).

329. *Id.* ch. II, art. 20 (revocation, etc., of permission).

330. Tae Hee Lee & Sugayan, *supra* note 272, § 2.2, at S.Kor-12.

331. *Id.* § 2.2, at S.Kor-13.

332. Atmospheric Environment Preservation Act, ch. IV, art. 38 (order on improvement of running car).

333. KOREA UNCED REPORT, *supra* note 284, at 76.

334. Tae Hee Lee & Sugayan, *supra* note 272, § 2.2, at S.Kor-13.

335. *See id.*

336. Sang Don Lee, *Environmental Protection in The Northeast Asia Region*, 19 KOREAN J. COMP. L. 117, 123 (1991).

337. *See* Tae Hee Lee & Sugayan, *supra* note 272, § 2.6, at S.Kor-16.

noise regulation zones.<sup>338</sup> The MOE can require the establishment of noise abatement barriers or other remedial measures to reduce noise from, for example, road traffic and construction work.<sup>339</sup> Specifically regarding construction noise, the MOE can require that contractors submit a report outlining proposed noise producing activities, thus enabling the MOE to determine the desirability of preventative measures such as work-hour regulation and the use of noise reduction equipment at the site.<sup>340</sup>

3. *Water Pollution.* "A MOE report released [on] June 23, [1992] shows that while air quality in Korea improved in 1991, river contamination increased."<sup>341</sup> "Permissible emission standards" are established under Article 14 of the Water Environment Protection Act (WEPA), which sets the maximum amount of pollutants permissible as discharge into waters.<sup>342</sup> Generally, regulation of effluent facilities is identical to that regarding air pollution.<sup>343</sup> Stricter regional standards are permitted, and special emission standards may be applied to newly installed discharge equipment.<sup>344</sup> A plan to designate specific zones for the setting of different effluent standards was passed despite intense opposition from development interests (the plan banned certain developments near reservoirs).<sup>345</sup> These zones, known as "Special Water Pollution Control Areas," are located in water supply basins.<sup>346</sup> In these and other areas, BEPA specifically prohibits the dumping of certain waste, such as industrial effluent, animal carcasses, and sewage, into inland lakes, rivers, and streams.<sup>347</sup> The MOE, or its local representative, is authorized to issue orders to polluters requiring the elimination of these pollutants under penalty of a fine not to exceed S.K. won 1 million (approximately U.S. \$1,230).<sup>348</sup> Noncompliance with an MOE order can

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338. *See id.*

339. *See* KOREA UNCED REPORT, *supra* note 284, at 77.

340. *See* Tae Hee Lee & Sugayan, *supra* note 272, § 2.6, at S.Kor-16.

341. *Environmental Trends in Korea*, *supra* note 287.

342. *See* Tae Hee Lee & Sugayan, *supra* note 272, § 2.3, at S.Kor-13.

343. Sang Don Lee, *supra* note 336, at 123.

344. *See* Tae Hee Lee & Sugayan, *supra* note 272, § 2.3, at S.Kor-13 to -14.

345. *See* South Korea BNA, *supra* note 278, at 61.

346. *See* KOREA UNCED REPORT, *supra* note 284, at 77.

347. *See* Tae Hee Lee & Sugayan, *supra* note 272, § 2.3, at S.Kor-14.

348. *See id.*

result in a fine of up to S.K. won 2 million (approximately U.S. \$2,460) or imprisonment for up to six months.<sup>349</sup>

The Marine Pollution Protection Act (MPPA)<sup>350</sup> regulates pollution affecting the marine environment, although BEPA also provides some direct protection.<sup>351</sup> In general, regulations cover marine pollution from vessels, offshore facilities, and marine dumping, as well as provide for the establishment of antipollution zones in coastal sea areas.<sup>352</sup> The MPPA, however, mandates less stringent discharge standards than those contained in the International Convention for the Prevention of Pollution from Ships (MARPOL).<sup>353</sup>

4. *Toxic Substances Pollution.* The manufacture, import, export, sale, and handling of toxic substances is strictly regulated by the Toxic Chemicals Control Act of 1990 (TCCA).<sup>354</sup> South Korea's listing of 427 toxic chemicals is particularly impressive in light of the fact that the TCCA was enacted as recently as 1990.<sup>355</sup> The TCCA requires all businesses dealing with toxic substances to register with the local office of the MOE.<sup>356</sup> All prospective manufacturers or importers of toxic substances are required to first present the substances for inspection by the MOE.<sup>357</sup> No action may be taken with the submitted substances until the assessment for environmental and health hazards by the MOE is completed.<sup>358</sup> Provisions have recently been made for the protection of trade secrets and confidential business information that must be disclosed when complying with the TCCA.<sup>359</sup> Violations of the TCCA will trigger criminal sanctions, including imprisonment for up to three years or fines of up to S.K. won ten million (approximately U.S. \$12,340).<sup>360</sup>

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349. *See id.*

350. Hae Yang O Yöm Pang Chi Pöp [Marine Pollution Prevention Act] L. No. 4365 (as amended Mar. 8, 1991).

351. *See Sang Don Lee, Marine Environment Law in Korea*, 11 KOREAN J. COMP. L. 91, 91-92 (1983).

352. *Id.* at 95.

353. *Id.* at 96-97.

354. Tae Hee Lee & Sugayan, *supra* note 272, § 2.4, at S.Kor-15.

355. KOREA UNCED REPORT, *supra* note 284, at 80.

356. Tae Hee Lee & Sugayan, *supra* note 272, § 2.4, at S.Kor-15.

357. Sang Don Lee, *supra* note 336, at 123-24.

358. *See* KOREA UNCED REPORT, *supra* note 284, at 80.

359. *See Environmental Protection Rules*, *supra* note 284, available in LEXIS, World Library, ALLWLD File.

360. Tae Hee Lee & Sugayan, *supra* note 272, § 2.4, at S.Kor-15 to -16.

5. *Other Environmental Problems.* A myriad of environmental pressures urge an expansion of the South Korean Code to cover specific issues that broader legislation has necessarily omitted. Laws that have already been enacted, but that were not addressed above, include the Environmental Damage Dispute Mediation Act,<sup>361</sup> the Natural Environment Preservation Act,<sup>362</sup> the Water Pollutant-Excrement-Livestock Breeding Wastewater Control Act,<sup>363</sup> the Synthetic Resin Waste Processing Enterprise Act,<sup>364</sup> and the Environmental Improvement Expense Assumption Act.<sup>365</sup>

Future environmental planning in South Korea is also effectuated through BEPA, which includes provisions for Environmental Impact Assessments (EIAs),<sup>366</sup> and the implementation of the Polluter Pays Principle (requiring the polluter to internalize the costs of anti-environmental practices) through the authorization of an effluent charge.<sup>367</sup> Additionally, a general "environmental charge system" that will place a tariff on polluting activities or goods is also being contemplated by the South Korean government.<sup>368</sup>

#### E. Future Concerns

The South Korean government also labors under the threat of transboundary pollution damage from North Korean projects such as nuclear power generation.<sup>369</sup> The South Korean government has been motivated by prospective fears of the population regarding North Korean nuclear power to make overtures to the North Korean

361. Hwan Kyöng O Yöm P'i Hae Bun Chaeng Cho Chöng Pöp [Environmental Damage Dispute Mediation Act] L. No. 4258 (Aug. 1, 1990) (contributing to the peaceful resolution of frequently explosive disputes).

362. Cha Yöñ Hwan Kyöng Po Chöñ Pöp [Natural Environment Preservation Act] L. No. 4492 (Dec. 31, 1991) (protecting plants and animals).

363. O Su Pun Nyo Ch'uk San Pye Su üi Ch'ö Ri E Gwan Han Pöp Lyul [Water Pollutant-Excrement-Livestock Breeding Wastewater Control Act] L. No. 4364 (Mar. 8, 1991).

364. Hap Söng Su Ji Pye Gi Mul Ch'o Ri Sa Öp Pöp [Synthetic Resin Waste Processing Enterprise Act] L. No. 3182 (Dec. 28, 1979), *amended by* L. Nos. 4183 (Dec. 30, 1989), 4363 (Mar. 8, 1991).

365. Hwan Kyöng Kae Sön Pi Yong Pu Dam Pöp [Environmental Improvement Expense Assumption Act] L. No. 4493 (Dec. 31, 1991).

366. *See South Korea BNA, supra* note 278, at 59 (noting that the first inclusion of EIAs into development planning came about in the late 1970s).

367. *See KOREA UNCED REPORT, supra* note 284, at 83.

368. *Id.*

369. *See Kim Hyeh-won, Seoul Asks P'yang to Drop Nuke Reprocessing Plant, KOREA NEWSREVIEW*, June 20, 1992, at 4.

government encouraging environmental cooperation and joint preservation methods.<sup>370</sup>

The critical focus of South Korea's environmental lawmakers, however, should be turned inward. Structural reform, not necessarily legislative, is necessary to overcome ingrained obstacles to efficient and effective environmental reform programs. The mighty *chaebol* will remain at the vanguard of anti-environment business and development concerns if initiatives such as the "environmental industrial policy" are not drafted to incorporate industrial ecology principles.<sup>371</sup> Polarizing the objectives of the policy by "minimizing the adverse effects [of] international environmental regulations" will only thwart legitimate environmental goals.<sup>372</sup>

## V. SINGAPORE

### A. History

Singapore's status as a focal point for Southeast Asian sea routes<sup>373</sup> caused the British East India Company to enter into a treaty in 1819 with Singapore's early rulers,<sup>374</sup> entitling the Company to establish a factory on the island.<sup>375</sup> The Company effectively controlled Singapore from 1824 until 1867, when the territory was officially designated as a British colony.<sup>376</sup> A period of colonial rule lasted until the island was occupied by the Japanese in 1942, at the height of World War II.<sup>377</sup> Although the Crown's role as "protector" had been undermined,<sup>378</sup> Britain resumed its administration of

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370. See *Ministry to Promote Environmental Exchanges with DPRK*, South Korea (FBIS) FBIS-EAS-92-235, at 26 (Dec. 7, 1992).

371. The environmental industrial policy was primarily formulated by two government ministries: that of Trade and Industry and that of Environment. *Environmental Trends in Korea*, *supra* note 287.

372. *Id.* ("minimization of adverse effects" is one of the stated aims of the environmental industrial policy).

373. See FREDERIC C. DEYO, *DEPENDENT DEVELOPMENT AND INDUSTRIAL ORDER: AN ASIAN CASE STUDY* 24 (1981).

374. Singapore was considered a part of the Sultanate of Johore, a state of Malaysia. *Sources and Literature of Singapore Law*, 2 *LAWASIA* 1, 1 (1982).

375. *Id.* Having established its industrial presence, the Company proceeded to exercise judicial powers over the inhabitants. *Id.* at 2.

376. See DEYO, *supra* note 373, at 23.

377. See GIBNEY, *supra* note 7, at 41.

378. See *id.* at 58.

Singapore in 1945 after Japan's defeat.<sup>379</sup> The island remained a British base with domestic autonomy, merging with the newly formed Federation of Malaysia in 1963.<sup>380</sup> The possibility that Singapore's Chinese population would increase the ethnic clashes common at the time, and the prospect of Singaporean economic domination of the Malay states, soon led the Malaysian Federation to push for the cession of Singapore.<sup>381</sup> In 1965 Singapore became an independent state.<sup>382</sup>

Singapore benefited from its history as a British "commercial, financial and entrepôt center" in which "trade duties were kept low and port facilities developed."<sup>383</sup> The separation from Malaysia, however, added to a feeling of national vulnerability, ready to be exploited at any time by Singapore's "ethnically diverse, immigrant population given to individualistic pursuits."<sup>384</sup> Thus, the Singaporean government had to pursue policies that would protect the island's financial growth and ensure social stability.<sup>385</sup>

On the one hand, a policy of economic liberalism holds sway over the island.<sup>386</sup> There are no antimonopoly laws or controls on technology transfer, no domestic-content requirements, and few controls on private investment.<sup>387</sup> On the other hand, in direct contrast to this free trade atmosphere, an intense "political will"<sup>388</sup> holds together a diverse Singaporean population. At present, Singapore's method of governance is characterized by extremely paternalistic policies devised to allow a high degree of governmental integration with the social system.<sup>389</sup>

379. See Kevin Tan Yew Lee, *A Short Legal and Constitutional History of Singapore*, in *THE SINGAPORE LEGAL SYSTEM* 3, 20 (Walter Woon ed., 1989).

380. *Id.* at 27-28.

381. See VOGEL, *supra* note 3, at 74-75.

382. See *Sources and Literature of Singapore Law*, *supra* note 374, at 16.

383. DEYO, *supra* note 373, at 24.

384. Pang Eng Fong, *supra* note 3, at 225. Singapore has an immigrant society composed largely of Chinese, Malaysians, and Indians. See DEYO, *supra* note 373, at 25.

385. Singapore's government has historically espoused methods worthy of both the most staunchly capitalist and socialist polities. See KELLY & LONDON, *supra* note 3, at 373-74; see also VOGEL, *supra* note 3, at 75, 79.

386. See Pang Eng Fong, *supra* note 3, at 227.

387. *Id.* Private investment is allowed in all areas except utilities and defense. *Id.*

388. Interview with Francis T. Seow, former Solicitor-General of Singapore, in Cambridge, Mass. (Jan. 5, 1993).

389. See Pang Eng Fong, *supra* note 3, at 232.



The legislature in Singapore is comprised of the President and the Parliament.<sup>390</sup> The executive function is exercised jointly by the President and the Cabinet or any Minister authorized by the Cabinet.<sup>391</sup> Judicial authority rests primarily with the Supreme Court under the Constitution, although statutory provisions are made for the vesting of such authority in subordinate courts and administrative tribunals.<sup>392</sup>

Singapore's law is currently a composite of Singaporean legislation and English common law and statutes.<sup>393</sup> The Singapore Constitution provides that "the power of the Legislature to make laws shall be exercised by Bills passed by Parliament and assented to by the President."<sup>394</sup> Legislation is composed of Acts of Parliament and subsidiary legislation.<sup>395</sup> The subsidiary legislation is enacted by the relevant Minister from powers derived from an Act of Parliament.<sup>396</sup> The Second Charter of Justice provides that statutes that were in force in England on November 27, 1826, are enforceable in Singapore, provided that they are of general application, suited to the conditions of Singapore, and are not inconsistent with or precluded by local legislation.<sup>397</sup> Current English law is still applied in Singapore "by virtue of the Second Charter and the jurisprudential concept that the common law is ubiquitous and constant."<sup>398</sup> Hence, "[c]ases from other common-law jurisdictions may be legitimately referred to and cited for guidance."<sup>399</sup>

Singapore appears to be an anomaly in comparison with the other four Dragons due to its peaceful transition from a colonial system to

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390. Ian Thynne, *The Administrative State*, in *THE SINGAPORE LEGAL SYSTEM*, *supra* note 379, at 69, 73. Quasi-legislative authority may be vested in a court, minister, statutory office holder, an administrative tribunal, or the governing body of a non-ministerial organization through an act of subsidiary legislation. *Id.*

391. *Id.* at 72-75. Some executive functions may be performed, however, by officials of a ministerial organization or by non-ministerial organizations pursuant to administrative directives. *Id.*

392. *See id.* at 73.

393. *See* Walter Woon, *The Applicability of English Law in Singapore*, in *THE SINGAPORE LEGAL SYSTEM*, *supra* note 379, at 107, 107-08.

394. SING. CONST. art. 58(1), *reprinted* in 17 CONSTITUTIONS OF THE COUNTRIES OF THE WORLD 33 (Albert P. Blaustein & Gilbert H. Flanz eds., 1993).

395. *See generally* Kevin Tan Yew Lee, *Parliament and the Making of Law in Singapore*, in *THE SINGAPORE LEGAL SYSTEM*, *supra* note 379, at 54-60.

396. *Id.* at 60.

397. Woon, *supra* note 393, at 113-14, 117-18.

398. C.J. Chen et al., *Environmental Law of Singapore*, in *INT'L ENVTL. LAW AND REG.* § 1.3, at Sing-7 to -8 (J. Andrew Schlickman et al. eds., 1991).

399. *Id.* at Sing-8.

an independent state.<sup>400</sup> Within this apparent utopia, however, lies the ingredients for social upheaval. Singapore's small size makes it vulnerable to the pressures of neighboring states.<sup>401</sup> To maintain such worthy honors as being one of the largest ports<sup>402</sup> and having the second largest oil refinery in the world,<sup>403</sup> Singapore will not be able to rely on its relationship with other Association of South-East Asian Nations (ASEAN)<sup>404</sup> members for help. It will have to find internal means to take on the task of maintaining its current level of economic success while controlling its varied population, its relations with neighboring states, and its fragile environment that is sensitive to each of these factors.

## B. Regulatory Authorities

An intense political will fostered Singapore's ability to gain control of the environment long before the governments of the other Dragons.<sup>405</sup> The former Solicitor General of Singapore commented that the republic's successful management of environmental problems was not the result of "an overnight affair."<sup>406</sup> Instead, the diminutive state was among the first of the Dragons, and indeed the nations of the world, to establish "an agency dedicated to environmental protection."<sup>407</sup> Although the Ministry of Environment (MOE) is the

400. Interview with Francis T. Seow, *supra* note 388; see also Pang Eng Fong, *supra* note 3, at 225-26.

401. Further evidence of Singapore's insecurity concerning its neighbors is the fact that "per capita, the island is one of the most heavily armed nations in the world." Interview with Francis T. Seow, *supra* note 388.

402. MINISTRY OF INFORMATION AND THE ARTS, SINGAPORE FACTS AND PICTURES 1992, at 102, 188 (1992). This description refers to shipping tonnage. *Id.*

403. CHIA LIN SIEN ET AL., THE COASTAL ENVIRONMENTAL PROFILE OF SINGAPORE 53 (1988).

404. Jonathan Rigg & Philip Stott, *The Rise of the Naga: The Changing Geography of South-East Asia 1965-90*, in THE CHANGING GEOGRAPHY OF ASIA, *supra* note 3, at 76, 76-77. Of the four Dragons, Singapore is the only member of ASEAN. Other ASEAN members are Brunei, Indonesia, Malaysia, the Philippines, and Thailand. *Id.* ASEAN promotes a market-based strategy of economic development and tariff controls in the tradition of Western common markets such as the European Community. See *id.* at 92-93.

405. Interview with Francis T. Seow, *supra* note 388.

406. *Id.*

407. *Singapore*, [286-Singapore] Int'l Env'tl. Rep. (BNA) No. S-106, at 41 (July 1991) [hereinafter *Singapore BNA*]. The Ministry of Environment was founded in 1972. POLLUTION CONTROL DEPT., MINISTRY OF THE ENVIRONMENT, AIR AND WATER POLLUTION AND THE CONTROL OF ENVIRONMENTAL HAZARDOUS CHEMICALS 2 (n.d.). As early as 1959, the government launched operation *Pantai Chantek* [Beautiful Beaches] to encourage citizen participation in environmental issues. Joyce Quek, *Singapore: Cleaning Up the City—Environment*, FIN. TIMES, Aug. 9, 1990, at VI.

principle environmental administrative agency,<sup>408</sup> many other administrative organs contribute to enforcement, management, collection of refuse, and research related to environmental projects. Specifically, these include the Ministry of Communications, the Port of Singapore Authority, the Registry of Vehicles, the Ministry of National Development, the Ministry of Trade and Industry, and the Ministry of Health.<sup>409</sup> As will be discussed in the next subsection, however, the MOE retains control over the environmental protection infrastructure.

Far from suffering the overwhelmingly large and complex problems of the other Dragons, Singapore has rapidly turned its focus towards more specific environmental problems.<sup>410</sup> Ironically, the great lengths to which the Singaporean government has gone to further the cause of the environment have brought criticism by some of those who must live under rigid environmental paternalism.<sup>411</sup> For example, regulatory control is buoyed by the preventative emphasis in the government's programs on environmental education of the populace.<sup>412</sup> Remedial elements of government policy are also utilized. Corrective Work Orders (CWOs) imposed on an offending litterbug, for example, seek to educate through forced public service and public ridicule.<sup>413</sup>

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408. Chen et al., *supra* note 398, § 3.1, at Sing-30.

409. *Singapore BNA*, *supra* note 407, at 43. For a summary of the environmental administrative and enforcement duties of these divisions, see *id.* at 45-46.

410. For example, the government is currently going to great lengths to combat island air quality, including investment in an automated air monitoring system to place transportable monitoring stations at urban, industrial, rural, and roadside locations. Rachel Tan, *\$5 Million Automated System to Monitor Air Quality Islandwide*, STRAITS TIMES, Oct. 10, 1992, available in LEXIS, World Library, ALLWLD File. The system will purportedly "locate individual sources of pollution, like factories or stretches of roads." *Id.*

411. See *Parliament Briefs*, BUS. TIMES, Mar. 11, 1993, available in LEXIS, World Library, ALLWLD File (discussing whether MOE went too far in meting out corrective work orders on litter law offenders).

412. Chen, *supra* note 24, at 34. The MOE and other organizations have carried out numerous campaigns to promote environmental quality through public education. *Id.*; see also Chen et al., *supra* note 398, § 3.3, Sing-31 ("[The government] has launched environmental education programs focusing on littering, keeping rivers clean, prevention of mosquito breeding, toilet cleanliness, and food hygiene.").

413. See *CWO Implementation Smacks of China under Mao*, STRAITS TIMES, Mar. 11, 1993, available in LEXIS, World Library, ALLWLD File; see also STAN SESSER, THE LANDS OF CHARMS AND CRUELTY: TRAVELS IN SOUTHEAST ASIA 8 (1993) ("No litter mars a walk through Singapore's streets, because a litterbug must pay a fine of up to \$620 and undergo counseling.").

Any impetus for citizen challenges under these laws has been buffered by the government's paternalistic policies. These policies seem to provide for extensive legal or administrative redress in environmental areas, allowing for the venting of criticisms and obviating the need for citizen initiatives. Pervasive education programs have nonetheless served to increase the acceptability of government actions in the environmental area. One particular institution worth mentioning is the Service Improvement Unit (SIU). The SIU actively "liaises with the different ministries in order to follow up individual complaints."<sup>414</sup> The unit was devised to actively seek suggestions from citizens on improvements in service from the government departments, boards, and companies.<sup>415</sup> This internal review method, hopefully spurred by voluntary citizen response, somewhat precludes necessary resort to the courts for restitution or atonement.

Two years after the establishment of the Anti-Pollution Unit<sup>416</sup> under the Prime Minister's Office in 1970, the MOE was "set up with the hope of initiating *a more co-ordinated* and effective effort to combat pollution."<sup>417</sup> The MOE's administrative responsibilities are executed through four internal divisions: the Environmental Engineering Division, the Environmental Public Health Division, the Environmental Policy and Management Division,<sup>418</sup> and the Finance and Administrative Division.<sup>419</sup> These divisions are supported by internal hierarchies of departments which address specific environmental needs ranging from the computerized dissemination of information to the licensing of street hawkers' food stalls.<sup>420</sup> Even

414. T.K.K. Iyer, *Accountability and Review Processes in Modern Public Administration—The Role of Tribunals*, 12 SINGAPORE L. REV. 274, 281 (1991).

415. *Id.* at 281.

416. The Anti-Pollution Unit was elevated to the Pollution Control Department under the MOE in 1986. POLLUTION CONTROL DEPT., *supra* note 407, at 2.

417. Soon Choo Hock, *Pollution Control in Singapore*, 24 MALAY. L. REV. 213, 213 (1982) (emphasis added).

418. This division was created in 1990 as a result of the restructuring of the MOE. Its purpose is to "map out policies and strategies" to achieve Singapore's goal of becoming a regional "model environmental city." Genevieve Cua, *Singapore: Ministry of Environment Forms New Division to Map Out Policies, Strategies*, BUS. TIMES (Singapore), Reuter Textline, Dec. 28, 1990, available in LEXIS, World Library, ALLWLD File.

419. *Singapore BNA*, *supra* note 407, at 41-42.

420. Chen et al., *supra* note 398, § 3.1, at Sing-30 to -31. Two government-backed companies have formed a joint venture, the Singapore Environmental Management and Engineering Services Pte Ltd. Drawing upon MOE resources and expertise, this project in turn offers services relating to the management, supervision, operation, and maintenance of environmental infrastructures. *Singapore BNA*, *supra* note 407, at 42. The government also plans to establish

though other administrative organs have responsibilities that intersect and complement MOE work, MOE retains primary control of environmental planning, development, monitoring, and enforcement. According to a government report, "[t]he development of the infrastructure for collecting and treating liquid and solid wastes generated by the general population and industries is completed."<sup>421</sup> After this and other accomplishments, atypical among the "environment versus development" battles in the other Dragons, Singapore has refused to rest on its laurels and is pursuing increasingly lofty environmental protection goals as laid out in the government's Green Plan.<sup>422</sup>

### C. Grassroots Movements, Green Organizations, and Envirotech

In light of Singapore's aggressive, early-intervention policy with regard to environmental problems, it is not surprising that the governmental infrastructure provides means for input into the activities of citizen groups as well as a direct channel for these groups to voice their concerns over government policies.<sup>423</sup> In addition to the SIU mentioned above, other fora have been established to greatly enhance the citizen-government link. These include formal organizations such as Citizens' Consultative Committees (CCCs), Residents' Committees (RCs), and Community Center Management Committees (CCMCs).<sup>424</sup> Although termed "grassroots organizations" by the government, these groups represent a hybrid social construction and can hardly be deemed "a fundamental politico-economic group and

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an Institute of Environmental Technology in 1993, in the hopes of developing the republic into a "regional centre for environmental management and technology" by the year 2000. MINISTRY OF THE ENVIRONMENT, SINGAPORE, *THE SINGAPORE GREEN PLAN: TOWARDS A MODEL GREEN CITY 46* (1992) [hereinafter *SINGAPORE GREEN PLAN*].

421. POLLUTION CONTROL DEPT., *supra* note 407, at 1.

422. *SINGAPORE GREEN PLAN*, *supra* note 420, at 1-48. Among the most recent issues the MOE has raised with the public are the need to guard against the impact of tourism on the island's natural habitats; the minimization of refuse so as to obviate the need for another incineration plant at a cost of U.S. \$375 million; the designation of the National Parks Board as custodian of coral reefs and other marine sites as well as natural reserves; encouragement of the use of energy-saving appliances through a green labeling scheme; the imposition of fines on polluters and higher refuse disposal charges; and the provision of more recycling services and the possibility of more subsidies for private sector recycling initiatives. See *Singapore—Environmental Plans*, 1993 National Trade Data Bank, Market Reports, June 16, 1993, available in LEXIS, World Library, ALLWLD File.

423. See generally *SINGAPORE 1992: A REVIEW OF 1991*, at 190-97 (Joyce Tan et al. eds., 1992) [hereinafter *SINGAPORE 1992*].

424. *Id.* at 196-97.

a source of independent popular opinion," as distinguished from the centers of political leadership.<sup>425</sup> The members of these committees serve voluntarily, although the government provides administrative support.<sup>426</sup>

[The] CCCs act as co-ordinating bodies for community projects in their respective constituencies. They co-ordinate the efforts of the CCMCs, RCs and other grassroots organisations, and provide feedback and make recommendations to the government on national issues, as well as local concerns such as physical and social amenities for the constituency.<sup>427</sup>

Membership in the RCs is limited to citizens living in the same zone.<sup>428</sup> These bodies "promote community development among the residents of [Housing and Development Board (HDB)] estates. They [also] encourage neighbourliness, harmony and community cohesiveness."<sup>429</sup> Hence, existing citizen organizations that contribute to environmental protection, such as the Nature Society and the Consumers Association, retain structural or other links to the government.<sup>430</sup>

In tandem with community-level environmental initiatives, the Singapore government has been extremely aggressive in its promotion of envirotech, or "green business," in keeping with the Green Plan's goal of making the island republic "a regional centre for environmental technology from which environmental engineering services can be provided to the Asia-Pacific region and beyond."<sup>431</sup> The envirotech

425. WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 991 (3d. ed. 1986).

426. *See* SINGAPORE 1992, *supra* note 423, at 194.

427. *Id.*

428. *See id.* at 195. Generally, one zone includes apartment blocks of 500 to 2,500 apartments. *Id.*

429. *Id.* Almost 87 percent of Singapore's population lives in HDB apartments. *See id.* at 182.

430. *See* WHO IS WHO AT THE EARTH SUMMIT: RIO DE JANEIRO 1992, *supra* note 313, at 322. A third citizen organization, the National Council on the Environment, was formed in 1990 to help the government transform Singapore into a green city. *See* Dominic Nathan, *Protected Birds Can Be Found in Singapore Shops*, THE STRAITS TIMES, June 6, 1993, at 22. This organization recently challenged the government's wildlife protection policy, charging that the laws are ineffective given that Singapore serves as a transshipment center in the illegal trade of endangered wildlife. *Id.*

431. SINGAPORE GREEN PLAN, *supra* note 420, at 3.

industry in Singapore is already quite developed,<sup>432</sup> and foreign investment in the area is explicitly encouraged.<sup>433</sup>

#### D. Environmental Laws

1. *Air Pollution.* Air pollutants were not targeted for control by the Singapore government until the 1970s, when the effects of rapid development began to materialize.<sup>434</sup> Responsibility for maintaining air quality in Singapore lies with the Pollution Control Department (PCD).<sup>435</sup> PCD actions are governed by the provisions of the Clean Air Act (CAA),<sup>436</sup> which covers only emissions from stationary sources of pollution.<sup>437</sup> Presently, the CAA "grant[s] government officials seemingly limitless discretion to regulate industrial air pollution."<sup>438</sup> Industries (and other potential stationary polluters) are "designated as 'Scheduled Premises' . . . requir[ing] the operator of such premises to acquire] Written Permission of the Director of Air Pollution Control before occupying and starting operation."<sup>439</sup> Parties responsible for such premises may also be required "to alter or replace any fuel-burning or control equipment, to change their methods of operation, to use a specified type of fuel, or even to entirely dismantle an industrial plant."<sup>440</sup>

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432. American Embassy in Singapore, *Singapore—Environmental Technology Industry Overview*, 1993 National Trade Data Bank, Market Reports, May 14, 1993, available in LEXIS, World Library, ALLWLD File.

433. See *id.* ("[F]oreign companies can make use of Singapore to showcase and sell their environment technology to the Asian market."). The market for foreign environmental technology is not mere hopefulness on the part of the government. Total expenditure on the environment in the year 1992 was "estimated at U.S.\$ 376 million with U.S.\$ 152 million provided for development expenditure for introduction of new environmental technologies for solid waste incineration and research on CFCs." American Embassy in Singapore, *Singapore—Industrial Air Pollution Control Equipment*, 1993 National Trade Data Bank, Market Reports, Jan. 15, 1993, available in LEXIS, World Library, ALLWLD File.

434. See Soon Choo Hock, *supra* note 417, at 215.

435. Chen et. al., *Environmental Law of Singapore*, *supra* note 398, § 2.3, at Sing-13.

436. Clean Air Act, STATUTES OF THE REPUBLIC OF SINGAPORE ch. 45 (1971), as amended (1975).

437. Soon Choo Hock, *supra* note 417, at 215.

438. Smith, *supra* note 23, at 127.

439. POLLUTION CONTROL DEPT., *supra* note 407, at 5. "Scheduled Premises" refers to industries with the potential to cause serious air pollution, including chemical plants, cement factories, and factories with large boilers or furnaces. POLLUTION CONTROL DEPT., MINISTRY OF THE ENVIRONMENT, SINGAPORE, 1992 POLLUTION CONTROL REPORT 32-33 (1992) [hereinafter 1992 REPORT].

440. Smith, *supra* note 23, at 127 (footnotes omitted).

The Clean Air (Standards) Regulations 1972 specify acceptable levels of controlled air pollutants.<sup>441</sup> Under the Regulations, "dark smoke"<sup>442</sup> emissions are prohibited and air impurities are controlled to a varying degree, depending on the industry and pollutants involved.<sup>443</sup> Those premises that are emitting pollutants outside the stipulated ranges are placed on reductions schedules.<sup>444</sup> To ensure that stationary emissions sources remain in compliance with the law, PCD staff conduct routine inspections and spot checks.<sup>445</sup>

The Road Traffic Act addresses the emission of smoke from motor vehicles.<sup>446</sup> In addition to introducing emissions standards for all types of vehicles, the government has employed various economic and command-and-control measures to curb the use of vehicles and the pollutants emitted therefrom. These measures include the imposition of road taxes and restricted entry into the city at certain times of the day.<sup>447</sup> Government subsidies of unleaded gas have promoted use of this fuel and have facilitated the imposition of even stricter emissions controls and the mandatory use of catalytic converters.<sup>448</sup> Failing these remedial measures, the PCD, the Registry of Motor Vehicles, and the Traffic Police coordinate efforts to monitor the streets for offending vehicles.<sup>449</sup> Air pollution monitoring stations located around Singapore provide a constant

441. Clear Air (Standards) Regulations (S. 14/71), *amended by* (S. 43/78), *Gazette* (1978). The Clean Air (Standards) Regulations were amended in 1978 to "raise emission standards for air pollutants (with some exceptions) to 50%." Deborah L. Blum, *A Guide to the Environmental Legal Regime of Singapore for Foreign Investors*, 28 SAN DIEGO L. REV. 853, 868 (1991) (footnote omitted).

442. Dark smoke is "any smoke which is as dark as or darker than shade number 2 of the Ringelmann Chart." Soon Choo Hock, *supra* note 417, at 216. The Ringelmann Chart: consists of black cross-hatching on a white background of card, wood or other material, in such a manner that varying determined percentages of the white background are obscured. The chart is then held up by the observer and the general impression [is] compared with the colour of the smoke emitted.

*Id.* at 216 n.24.

443. *Id.* at 216-17.

444. See POLLUTION CONTROL DEPT., *supra* note 407, at 5 ("Notice can be served under the Act to any trade and industrial premises requiring the operators to take remedial action to abate air pollution problems within a certain period of time.").

445. See Chen et al., *Environmental Law of Singapore*, *supra* note 398, § 2.3, at Sing-13.

446. Road Traffic Act, STATUTES OF THE REPUBLIC OF SINGAPORE ch. 276 (1976), *as amended* (1985).

447. Chen, *supra* note 24, at 33; Soon Choo Hock, *supra* note 417, at 219.

448. POLLUTION CONTROL DEPT., *supra* note 407, at 6.

449. See 1992 REPORT, *supra* note 439, at 12.



sampling of ambient air quality as it is affected by mobile, as well as stationary, sources.<sup>450</sup>

2. *Noise Pollution.* Singapore is equally concerned about noise pollution.

[T]he Miscellaneous Offenses (Public Order and Nuisance) Act<sup>451</sup> prohibits a person from making any noise by any instrument or other means in such a manner as to cause or be likely to cause annoyance or inconvenience to the occupiers of the premises in the vicinity of public roads or public places. This offense is punishable by a fine of up to S\$1,000 [approximately U.S. \$630].<sup>452</sup>

The Motor Vehicles (Construction and Use) Rules of 1974<sup>453</sup> "require every vehicle to be fitted with a silencer to reduce [engine] noise caused by the escape of the exhaust gases."<sup>454</sup> Despite the fact that construction noise is a principal source of noise pollution on the island, the only regulation presently regulating this nuisance is the Environmental Public Health Act (EPHA).<sup>455</sup> This statute gives the Commissioner of Public Health broad discretion in limiting noise emanating from construction sites.<sup>456</sup> The EPHA currently implements a discernible decibel ceiling for construction activities on the island.<sup>457</sup> This is a marked improvement over earlier legislation which only prohibited "excessive noise."<sup>458</sup>

3. *Water Pollution.* The major laws relating to water pollution in Singapore are contained in the Water Pollution Control and Drainage Act<sup>459</sup> and the Trade Effluent Regulations of 1976.<sup>460</sup>

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450. See POLLUTION CONTROL DEPT., *supra* note 407, at 7.

451. Miscellaneous Offenses (Public Order and Nuisance) Act (1906), *amended by* (S. 114/65), STATUTES OF THE REPUBLIC OF SINGAPORE ch. 184 (1989).

452. Chen et al., *Environmental Law of Singapore*, *supra* note 398, § 2.6, at Sing-24.

453. Motor Vehicles (Construction and Use) Rules (S. 55/91), *amended by* (S. 288/91), *Gazette* (1991).

454. Soon Choo Hock, *supra* note 417, at 221.

455. Environmental Public Health Act, STATUTES OF THE REPUBLIC OF SINGAPORE ch. 95 (1968), *as amended* (1975); *see also* Soon Choo Hock, *supra* note 417, at 220.

456. *See* Chen et al., *Environmental Law of Singapore*, *supra* note 398, § 2.6, at Sing-24; *see also* Environmental Public Health Act (Control of Noise from Construction Sites) Regulations (S. 466/90), STATUTES OF THE REPUBLIC OF SINGAPORE (1990).

457. Environmental Public Health Act, STATUTES OF THE REPUBLIC OF SINGAPORE ch. 95 (1968), *as amended* (1993).

458. *See* Soon Choo Hock, *supra* note 417, at 221.

459. Water Pollution Control and Drainage Act, STATUTES OF THE REPUBLIC OF SINGAPORE ch. 348 (1975), *as amended* (1983).

460. Trade Effluent Regulations (S. 122/76), *amended by* (S. 201/77), (S. 314/81), and (S. 121/83), *Gazette* (1983); *see also* Surface Water Drainage Regulations (S. 121/76), *Gazette* (1976);

The Water Pollution Control Department (WPCD) essentially requires that all owners or occupants of premises make adequate provision for the disposal of wastewater into an accredited sewer.<sup>461</sup> The regulations provide for all manner of exigencies and require the permission of the Director of the WPCD before any structures are built near any sewer and before sewage systems and sanitary facilities are constructed.<sup>462</sup> In the case of temporary structures at construction sites, temporary sanitary facilities are required to be connected to public sewers or temporary septic tanks.<sup>463</sup> Penalties for violating these provisions can be severe. For the first offense, a person may face fines of up to S. \$10,000 (approximately U.S. \$6,280) and/or imprisonment for up to six months.<sup>464</sup> Repeat offenders are fined up to S. \$20,000 (approximately U.S. \$12,560) and may be imprisoned for at least one month, but not more than one year.<sup>465</sup>

The Trade Effluent Regulations, amended by the Trade Effluent (Amendment) Regulations of 1977,<sup>466</sup> define the chemical standards for all trade effluents that may be introduced into sewers.<sup>467</sup> Basically, effluent discharges cannot exceed stipulated limits for pH values, temperature, suspended solids, biochemical oxygen demand, and other criteria.<sup>468</sup> Industries are generally required to install *in situ* treatment facilities before licensing.<sup>469</sup> However, if the industry meets specified limits for biodegradable pollutants, it has the option of paying a fee for dumping into the sewer—a valuable option for small-scale operations which may find it impractical or uneconomical to install, operate, and maintain their own effluent treatment plants.<sup>470</sup>

The Prevention of Pollution of the Sea Act<sup>471</sup> governs dumping or discharge of pollutants that will despoil the marine environment

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1992 REPORT, *supra* note 439, at 15, 34.

461. See POLLUTION CONTROL DEPT., *supra* note 407, at 8.

462. *Id.* at 8-9.

463. *Id.* at 8.

464. Chen et al., *Environmental Law of Singapore*, *supra* note 398, § 2.4, at Sing-18.

465. *Id.*

466. See *supra* note 460.

467. See 1992 REPORT, *supra* note 439, at 15, 34.

468. See POLLUTION CONTROL DEPT., *supra* note 407, at 9; see also Chen et al., *Environmental Law of Singapore*, *supra* note 398, § 2.4, at Sing-19.

469. 1992 REPORT, *supra* note 439, at 16.

470. See POLLUTION CONTROL DEPT., *supra* note 407, at 9-10.

471. Prevention of Pollution of the Sea Act, STATUTES OF THE REPUBLIC OF SINGAPORE ch. 243 (1971), as amended (1990). The amended Act entered into force in January 1991. Prevention of Pollution of the Sea Act (Commencement) Notification (S. 22/91), *Gazette* (1991).

within the territorial waters of Singapore.<sup>472</sup> Discharges of oil, refuse, garbage, waste, effluents, plastics, and dangerous pollutants into the sea are prohibited.<sup>473</sup> The Act was amended in 1990 to conform to the terms of the International Convention for the Prevention of Marine Pollution from Ships (MARPOL) concerning the transport and disposal of oil and noxious chemical substances.<sup>474</sup>

4. *Toxic Substances Pollution.* In 1985 Singapore's Minister of the Environment was quoted as saying, "[i]t is [the MOE] policy to ensure that [Singapore does] not become a major storage center . . . for trade in hazardous substances nor a [regional] disposal ground for toxic waste."<sup>475</sup> The Environmental Public Health Act primarily prohibits the disposal of refuse or industrial waste in any place except an authorized public disposal facility.<sup>476</sup> Legislation controlling the use, storage, and disposal of toxic substances includes the Radiation Protection Act,<sup>477</sup> the Petroleum Act,<sup>478</sup> the Arms and Explosives Act,<sup>479</sup> and the Poisons Act.<sup>480</sup> The PCD enjoys broad jurisdiction over the execution of rules governing toxic or hazardous substances.<sup>481</sup> The Poisons Act and the associated Poisons (Hazardous Substances) Rules stipulate thirteen classes of chemicals as hazardous.<sup>482</sup> The Petroleum Act governs the transport and storage of petroleum and mandates the application for a permit if this petroleum is "dangerous."<sup>483</sup> Time limits are also set for the unloading of petroleum.<sup>484</sup> The Poisons Act regulates the import, possession,

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472. See Chen et al., *Environmental Law of Singapore*, *supra* note 398, § 2.4, at Sing-19 to -20.

473. See POLLUTION CONTROL DEPT., *supra* note 407, at 10.

474. *Id.*

475. *Controls Tightened on Hazardous Chemicals*, E. ASIAN EXECUTIVE REP., Dec. 1985, at 20 (quoting Environment Minister Ahmad Mattar).

476. Blum, *supra* note 441, at 874.

477. Radiation Protection Act, STATUTES OF THE REPUBLIC OF SINGAPORE ch. 262 (1973), *as amended* (1990).

478. Petroleum Act (1908), *amended by* (S. 268/85), STATUTES OF THE REPUBLIC OF SINGAPORE ch. 229 (1978).

479. Arms and Explosives Act (1913), *amended by* (S. 109/66), STATUTES OF THE REPUBLIC OF SINGAPORE ch. 13 (1973).

480. Poisons Act (1938), *amended by* (S. 211/86), STATUTES OF THE REPUBLIC OF SINGAPORE ch. 234 (1980).

481. See Chen et al., *Environmental Law of Singapore*, *supra* note 398, § 2.4, at Sing-22.

482. See POLLUTION CONTROL DEPT., *supra* note 407, at 11.

483. Chen et al., *Environmental Law of Singapore*, *supra* note 398, § 2.5, at Sing-23.

484. *Id.*

manufacture, compounding, storage, transport, and sale of poisons via licensing.<sup>485</sup>

The control achieved by the general licensing requirements imposed under the toxic substances legislation is enhanced by provisions for pretransport approval, specified disposal procedures, and the siting of hazardous substance at facilities away from residential areas.<sup>486</sup> Cradle to grave control of hazardous substances is not specifically indicated. Apparently, much reliance is placed on the permit systems under the various pieces of legislation. The overall strategy for toxic substance regulation in Singapore remains to (1) avoid the danger as far as possible; (2) prevent realization of the danger; and (3) mitigate impacts in the event of accidents.<sup>487</sup>

5. *Other Environmental Problems.* Much of Singapore's environmental control is realized through social controls,<sup>488</sup> thereby limiting somewhat the necessity for expansive legislation. However, many important laws were not discussed in the preceding sections. These include the Destruction of Disease-Bearing Insects Act,<sup>489</sup> the Factories Act,<sup>490</sup> and the Infectious Diseases Act.<sup>491</sup> Wildlife, including flora, is protected generally through the Wild Animals and Birds Act and the National Parks Act.<sup>492</sup>

## E. Future Concerns

Tight political and social control remains the standard by which environmental success is attained in Singapore.<sup>493</sup> The problem with relying on such a system is that the control emanates from the drive

485. *Id.*; see also POLLUTION CONTROL DEPT., *supra* note 407, at 11.

486. See POLLUTION CONTROL DEPT., *supra* note 407, at 11-12.

487. *Id.* at 11.

488. See Soon Choo Hock, *supra* note 417, at 213-14; see also Smith, *supra* note 23, at 137-38.

489. Destruction of Disease-Bearing Insects Act (1968), amended by (S. 221/72), STATUTES OF THE REPUBLIC OF SINGAPORE ch. 79 (1973).

490. Factories Act (1973), amended by (S. 228/85), STATUTES OF THE REPUBLIC OF SINGAPORE ch. 104, § 64 (1986) (aiming to reduce employee exposure to excessive noise).

491. Infectious Diseases Act (1976), amended by (S. 196/85), STATUTES OF THE REPUBLIC OF SINGAPORE ch. 137 (1980).

492. See Wild Animals and Birds Act, STATUTES OF THE REPUBLIC OF SINGAPORE ch. 351 (1965), as amended (1985); National Parks Act (S. 10/90), STATUTES OF THE REPUBLIC OF SINGAPORE (1990) (repealing Nature Reserves Act (1951), amended by (S. 9/86), STATUTES OF THE REPUBLIC OF SINGAPORE ch. 205 (1973)).

493. *Singapore and the Problems of Success*, THE ECONOMIST, Aug. 22, 1992, at 25 (discussing the government's strict political and social control in Singapore).

and ambition of a single person, now Senior Minister Lee Kuan Yew.<sup>494</sup> Even though Goh Chok Tong is acting Prime Minister, Lee Kuan Yew remains a stabilizing and driving influence.<sup>495</sup> Purportedly, Singapore's timely environmental assertiveness was a result of former Prime Minister Lee Kuan Yew's disgust with the state of the Singapore environment early in his career, when the republic had yet to start its impressive economic growth.<sup>496</sup> Thus, environmental considerations were part of Singapore's development plans from their genesis.

When the successful implementation of environmental legislation depends so much on the concurrent success of social conditioning, it is worrisome to consider the fate of the cleanest of the Dragons—the *cleanest country in Asia*—without the reinforcing influence of a paternalistic government. Prime Minister Goh Chok Tong appears to have no desire to experiment with Lee Kuan Yew's legacy. The Singaporean people, accustomed to a strong government, cannot be blamed if they believe that environmental problems are "for the Government to handle."<sup>497</sup> If the government ceases its proactive policies, however, the laws will not carry themselves into effect.

## VI. CONCLUSION

The four Dragons represent diverse political and legal traditions, peoples, and geographies. One striking resemblance can be seen in their hasty, but effective, economic policies. The Dragons' colonial histories also reveal similarities. Three of the states have broken from colonial rule during the past fifty years. The fourth, Hong Kong, will be making the transition soon. The dependency that developed during the early days of colonial administration reinforced the infrastructures and economies of the Dragons. It also altered societal norms. Leading Asianists<sup>498</sup> point to Confucian and other traditions of thought shared among the four Dragons in an attempt to explain similar development patterns.<sup>499</sup> Eastern philosophies have histori-

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494. See Keith B. Richburg, *Asia and Africa: The Roots of Success and Despair; Two Regions of High Economic Potential Took Divergent Paths After Independence*, THE WASH. POST, July 12, 1992, at A1, A26.

495. See Ian Stewart, *Book of Speeches to Mark Lee's Birthday*, S. CHINA MORNING POST, Sept. 10, 1993, at 11.

496. Interview with Francis T. Seow, *supra* note 388.

497. Sharon Loh, *Slow Green Impact*, THE STRAITS TIMES, June 2, 1993, at 3.

498. See GIBNEY, *supra* note 7, at 247-54; VOGEL, *supra* note 3, at 92-101.

499. See GIBNEY, *supra* note 7, at 253; see also Pang Eng Fong, *supra* note 3, at 233-36.

cally represented the relationship of humans to nature. Paradoxically, "Asian peoples [are not] less inclined to exploit and destroy their natural environments than those in the West."<sup>500</sup>

Each facet of the four Dragons' backgrounds contributes to their present environmental regulatory systems. Taiwan, Hong Kong, South Korea, and Singapore have now surpassed the stage of dependent development. The systems previously discussed are therefore undergoing changes attributable to the Dragons' common realization that they must control their own destinies.<sup>501</sup>

The achievement of political independence in the Third World did not bring economic independence. Economies remained tied into the global system created by the industrialised world and their structure, which had been largely determined by the colonial authorities, proved very difficult to change. A few countries managed to avoid this trap . . . [including] those that escaped European colonialism such as South Korea and Taiwan . . . and the trade-based economies of Hong Kong and Singapore.<sup>502</sup>

As has been shown, the shining economies of the four Dragons have thrown off the tethers that thwarted their economic and international empowerment, but the environmental costs of this freedom constantly threaten to tarnish this enviable image.

No one systematic approach to environmental protection discussed in this Note can serve as an archetype. Institutional, historical, social, geographic, and political inconsistencies that have generated varied national priorities make this impossible. In examining the environmental regulatory systems of the four Dragons, it is important to identify overlapping characteristics of each regime that reinforce the effectiveness and efficiency of environmental protection, but which are not necessarily inexorably tied to specific regional characteristics.

Examples include the availability of environmental education in Hong Kong, but with the added support of the government as is the case in Singapore. Singapore's liberal use of economic incentives would be a welcome enhancement to Hong Kong's comprehensive

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500. J. Baird Callicott & Roger T. Ames, *Epilogue: On the Relation of Idea and Action*, in *NATURE IN ASIAN TRADITIONS OF THOUGHT: ESSAYS IN ENVIRONMENTAL PHILOSOPHY* 279, 279 (J. Baird Callicott & Roger T. Ames eds., 1989).

501. See generally William Irwin Thompson, *Pacific Shift*, in *NATURE IN ASIAN TRADITIONS OF THOUGHT: ESSAYS IN ENVIRONMENTAL PHILOSOPHY*, *supra* note 500, at 25 (discussing the transition from an industrial to an ecological world view).

502. CLIVE PONTING, *A GREEN HISTORY OF THE WORLD: THE ENVIRONMENT AND THE COLLAPSE OF GREAT CIVILIZATIONS* 222 (1991).

legislation. Additionally, a concentration of administrative control over environmental issues such as that existing in Singapore would dampen the conflicts of interest that arise in the widely distributed environmental division of labor existing in the other Dragons. Furthermore, the confidence represented by the Taiwan government's enormous environmental expenditures, when combined with the scope of Hong Kong environmental laws and the added transparency that proposed online access to these laws will create,<sup>503</sup> would perhaps cultivate the image in South Korea of an environment and an economy that are intertwined, that must share the same fate, and that can join to create a form of industrial ecology that will allow regenerative development.

Whatever the final equation for each of the Dragons, they must be careful not to replace old global tethers with new environmental chains. By employing their economic prowess to encourage a strong environmental sense of the future, and by retaining their respect for the importance of education and of saving for future generations,<sup>504</sup> as well as other characteristics which have been deemed key ingredients in Asian development, the four new Dragons will be able to realistically achieve sustainable development.

Richard J. Ferris Jr.\*

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503. See generally *Hong Kong Law Goes Online 02/25/91*, Newsbytes News Network, Feb. 25, 1991, available in LEXIS, Nexis Library, CURRNT File.

504. Richburg, *supra* note 494, at A26.

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