

## Article

# **Legal Development in Sustainable Solid Waste Management Law and Policy in Taiwan: Lessons from Comparative Analysis Between EU and U.S.**

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### ABSTRACT

*In recent years, the incorporation of the 4R principles: recovery, reduction, reuse and recycling into the waste management law and policy framework has become an important international trend. In response to the growing demands of sustainable waste management, the TEPA formulated a legal task force to propose a new waste management legislation entitled the bill of “Wasted Resource Closed-Loop Recycling”. The Legal Proposal incorporates sustainable waste management principles, such as the 4R principles, waste minimization, and extended producers responsibilities. This article will introduce the theoretical backgrounds and some fundamental environmental principles of sustainable waste management. The attention will be turned on to the legal experience of implementing sustainable waste management approaches in the EU and U.S. The study will include the evaluation of the promise and limits of solid waste management legislations implemented in light of EU, U.S. and Taiwan’s legal development. Based on the comparative legal study in this article, some observations and recommendations for the refinement of future sustainable waste management legal framework will also be provided.*

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**Keywords:** *Extended Producer Responsibility, Sustainable Solid Waste Management, Closed-Loop Recycling, 4R Principles, Zero Discharge*

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## I. INTRODUCTION

Since the early 90s, the boost of the IT industry has helped the revitalization of bad economies in some countries including Taiwan. The ongoing progress of industrialization and urbanization in Taiwan has resulted in a large quantity of industrial and municipal wastes. Because Taiwan is ranked high in the world for its dense population<sup>1</sup>, the overloaded landfill wastes disposal facilities and the NIMBY (Not in My Back Yard) syndrome of local communities finally caused the “trash war” in the early 90s. In response to the trash crisis, Taiwan Environmental Protection Administration (hereinafter TEPA) has developed a series of waste management regulatory system reforms since 1998. Despite some progress made in overall waste management during the last 20 years, the TEPA waste management policy framework has been criticized for lacking a long-term sustainable use of resources, assessment of product’s life-cycle, and sound planning for distributing administrative resources. Since the early 1990s, there has been a global trend for incorporating sustainable waste management approaches into laws and policies to address issues on the post-consumer stage of a product in the U.S, EU and some Asian countries.<sup>2</sup> For instance, the EU Electronic Waste Disposal and Packing Directives, and the U.S. product-oriented stewardship schemes have provided valuable lessons for Taiwan in drafting new waste management legislation. Accordingly, legal development in the EU and the U.S. will be explored in this article to evaluate methods for achieving effective waste minimization and resource recycling

Part II of this article will introduce background information and the significance of the 4R principle and other fundamental environmental principles related to sustainable waste management. Part III will explore the EU and the U.S.’s experience in implementing the sustainable waste management programs in the context of waste management and resource recycling regulatory system. In part IV of this article, the main theme and

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1. There is a total population of 23 million that reside in Taiwan which is 36,000 square km in area.

2. Germany, Denmark, Taiwan, Korea, and Japan have adopted legal framework aiming at waste reduction and increasing recycle-rate. As to comments discussing aforementioned states’ legal development, see, e.g., Catherine K. Lin, Linan Yan & Andrew N. Davis, *Globalization, Extended Producer Responsibility and the Problem of Discarded Computers in China: An Exploratory Proposal for Environmental Protection*, 14 GEO. INT’L ENVTL. L. REV. 525, 536 (2002); Noan Sachs, *Planning the Funeral at the Birth: Extended Producer Responsibility in the European Union and the United States*, 30 HARV. ENVTL. L. REV. 51, 53 (2006); Organisation for Economic Co-operation and Development [OECD], *Extended and Shared Producer Responsibility Phase 2 Framework Report*, at 13-14, ENV/EPOC/PPC(97)20/REV2 (May 11, 1998), available at [http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV/EPOC/PPC\(97\)20/REV2&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV/EPOC/PPC(97)20/REV2&docLanguage=En) (last visited Sept. 18, 2011) [hereinafter Phase 2 Framework Report].

underlying environmental principles of Taiwan's new legislative proposal will be examined. This article will also discuss the involvement and responses of all stakeholders in this ongoing legislative process, such as the industry, environmental service providers, citizen groups, and relevant government authorities. Finally, the objectives and the measures specified in the draft law will be evaluated. Some observations and recommendations for future implementation of an ideal sustainable waste management legal framework will be provided.

## II. COMPARATIVE STUDY OF THE U.S. AND EU'S SUSTAINABLE WASTE MANAGEMENT LAW AND POLICY

### A. *Brief Introduction to Sustainable Waste Management*

Since the 1992 Earth Summit, the principle of sustainable development has become a global consensus that aims at preventing or mitigating adverse effects to the earth's ecosystem resulting from human activities.<sup>3</sup> The 1992 Earth Summit also developed Agenda 21 to provide practical guidance and policy framework to implement "sustainability." Although waste management is widely considered as an environmental protection practice, waste management operation will also result in adverse effects to local communities and the environment as a whole. Agenda 21 thus recognizes the importance of adopting environmentally sound waste management practices to minimize the environmental burden.<sup>4</sup> Accordingly, Chapters 20, 21 and 22 of Agenda 21 deal specifically with waste management issues.

Agenda 21 specifies that environmentally sound waste management should go beyond merely safe disposal by instead establishing an integrated life-cycle product management framework.<sup>5</sup> The Agenda further specifies that the integrated life cycle management framework should consist of four major areas of waste management programs: (a) minimizing wastes, (b) maximizing environmentally sound waste reuse and recycling, (c) promoting environmentally sound waste disposal and treatment, and (d) extending waste service coverage. The Agenda emphasizes that national authorities

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3. See United Nations Conference on Environment and Development, Rio de Janeiro, Braz., June 3-14, 1992, *Rio Declaration on Environment and Development, Principle 8*, U.N. Doc. A/CONF.151/26/Rev.1 (Vol. I), Annex I (Aug. 12, 1992) ("[T]o achieve sustainable development and a higher quality of life for all people, States should reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies.").

4. See United Nations Conference on Environment and Development, Rio de Janeiro, Braz., June 3-14, 1992, *Agenda 21, Chapter 20, Chapter 21*, U.N. Doc. A/CONF.151/26 (Vol. I), Annex II, (Aug. 12, 1992) (Chapter 20 provides national authority policy guidance for achieving sound management of hazardous waste, including the prevention of illegal traffic of hazardous waste internationally; Chapter 21 provides policy guidance for states to establish environmentally sound waste management).

5. See *id.* Chapter 21.4.

shall establish a comprehensive waste management framework integrating these four areas of the action programs.<sup>6</sup> A timeline has also been set up for all signing countries for implementing the policies and action plans for waste reduction, reuse, recycling, and proper disposal based on the ability of each country by 2000.<sup>7</sup>

In addition to Agenda 21, since 1994 the OECD has also developed numerous reports and recommendations providing its member states practical policy guidance with respect to practicing environmentally sound waste management.<sup>8</sup> For instance, the OECD called for its member countries to implement the idea of “Environmentally Sound Management of Waste” (hereinafter ESM) in 2004.<sup>9</sup> Although there is no official agreement with regard to the definition of ESM due to its broad and complex concept, the working definition of ESM nevertheless can be found in the 2004 Council Recommendation as: “a scheme for ensuring that wastes and scrap materials are managed in a manner that will save natural resources, and protect human health and the environment against adverse effects that may result from such wastes and materials.”<sup>10</sup> Among the 2004 Council Recommendations, one recommendation is noteworthy because its objective is consistent with the Agenda 21’s life cycle framework to prevent and minimize waste generation. The OECD Council suggests that member countries encourage information exchange between producers, waste generators, waste managers and authorities in order to foster waste prevention, optimize recovery operations, and minimize quantities and potential risks of waste destined for disposal.<sup>11</sup> The recommendation indicates that enhancing information exchange may help all shareholders to take into account environmentally sound management of waste throughout the life cycle of all materials used in the products.<sup>12</sup> In other words, each stockholder could benefit from such information exchange by knowing the

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6. *See id.* Chapter 21.5, Chapter 21.6.

7. *See id.* Chapter 21.8, Chapter 21.9, Chapter 21.18, Chapter 21.29.

8. OECD Environment Directorate has conducted several study and published several reports to evaluate the performance and policy instruments in implementing EPR programs. *See, e.g.*, OECD, Extended Producer Responsibility in the OECD Area, Phase 1 Report [OCDE/GD(96)48] (July 19, 1996), available at [http://www.oecd.org/officialdocuments/displaydocumentpdf/?cote=OCDE/GD\(96\)48&doclanguage=en](http://www.oecd.org/officialdocuments/displaydocumentpdf/?cote=OCDE/GD(96)48&doclanguage=en) (last visited Sept. 15, 2011) (Phase 1 of EPR project examines legal and administrative approaches in some OECD member countries and developed initial policy options for EPR programmes); Phase 2 Framework Report, *supra* note 2 (Phase 2 analyses the economic efficiency and environmental effectiveness of various approaches to EPR during the period of 1996-1997).

9. *See* OECD, Draft Recommendation of the Council on the Environmentally Sound Management (ESM) of waste, C (2004)100 (May 18, 2004).

10. *See* OECD, Guidance Manual on Environmentally Sound Management of Waste 1, 9 (2007), available at <http://www.oecd.org/dataoecd/23/31/39559085.pdf> (last visited Sept. 15, 2011).

11. *Id.* at 29.

12. *Id.*

capacity of individual stockholders to achieve the goal of waste prevention or reduction. For instance, if the shared information reveals that a product is difficult to recycle, the producer, after reading the shared information provided by a waste manager, will have strong incentives to improve the product design so that all materials used in the product can be more easily recycled in an environmentally sound manner.

In addition to Agenda 21 and the OECD's development of life-cycle and waste minimization policy framework for achieving sustainability, another concept closely related to sustainable waste management is the "Extended Production Responsibilities" program (hereinafter EPR), which was first introduced by the OECD in 1994. After nearly a decade's development in theory and practice, the EPR has been adopted as an important policy guidance, and the underlying principle of waste management programs in many developed countries. In accordance with the OECD's definition, EPR is the concept that manufacturers and importers of products should bear a significant degree of responsibility for environmental impacts of all products they manufactured throughout the life cycle of each product.<sup>13</sup> The basic concept of the EPR program is to first shift waste handling responsibilities of a product after its consumption from local authorities to an upstream producer. Further, the EPR means that the relevant laws and regulation shall provide incentives for product manufacturers to seek environmentally sound designs for their products in order to achieve the objective of waste prevention and/or minimization.<sup>14</sup>

In short, the international community has recognized the importance of incorporating sustainable waste management approaches to addressing the issues of overloaded waste disposal facilities and the associated potential risks to human health since the last two decade. The following section will address the EU and U.S's experiences in terms of incorporating the life-cycle and the EPR approach in the context of overall waste management law and policy framework.

### B. *EU's Legal Experience*

The EU and its member states have taken the lead in the world in addressing the issue of overloaded waste by incorporating sustainable waste management programs in the context of a legal framework. The development of financial incentives and mandatory EPR programs has gradually increased the waste recycling rates throughout the EU.<sup>15</sup> This ongoing process of

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13. See Phase 2 Framework Report, *supra* note 2, at 8.

14. *Id.* at 10-11.

15. Germany, for instance, annual packaging consumption per capita dropped from 94.7 kg to 82 kg, and nearly 61 million tons of packaging has been recycled comparing 1991 and 1998. See OECD,

establishing sustainable waste management framework in the EU has provided valuable lessons for other countries and even the entire international community. The following section will discuss several landmark legislations of the EU and its member states that incorporate the EPR and life-cycle schemes.

1. *The Early Implementation of EPR Program: Germany's Legal Experience*

Before the OECD launched a series of study with respect to the EPR concept, Germany was the first EU member state to impose specific legal obligations to manufacturers to take-back and recycle their products after consumption. It is evident by the fact that Germany is the first Member State to incorporate the EPR concept in domestic law, namely the 1991 German Packaging Ordinance.<sup>16</sup> German's experience later inspired the widespread use of the EPR in the context of managing packaging and packaging waste. In 1994, the EU introduced the Packaging and Packaging Waste Directive (Directive 94/62/EC) requiring Member States to deal with packaging in environmentally sound manners.

It is notable that the EU Packaging Directive is mostly modeled after the German Packaging Ordinance, such as requiring all Member States to adopt appropriate measures to prevent the production of packaging, and to develop packaging reuse or recycle systems to reduce packaging waste.<sup>17</sup> The EU Directive also set forth several targets aimed at preventing formation of packaging and reducing the environmental impacts resulting from improper disposal of packaging waste. In regards to recovery and recycling, the Directive requires member states to establish the return and/or collection of used packaging systems in order to reach the target of recycling between 25 and 45% by weight of the total packaging materials contained in packaging waste before 30 June, 2001.<sup>18</sup>

Because the EU Directive does not impose any mandatory legal measures for Member States to comply with the packaging waste reduction target, it is thus noteworthy to discuss the mandatory legal regime at the national law level. As mentioned earlier, the German legal experience has taken a leading role in proposing appropriate legal measures to prevent excessive packaging and reducing packaging waste. German's legal

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EXTENDED PRODUCER RESPONSIBILITY: A GUIDANCE MANUAL FOR GOVERNMENTS 48 (2001) [hereinafter OECD GOVERNMENT MANUAL].

16. Amy Halper, *Germany's Solid Waste Disposal System: Shifting the Responsibility*, 14 GEO. INT'L ENVTL. L. REV. 135, 136 (2001); BETTE K. FISHBEIN, GERMANY, GARBAGE, AND THE GREEN DOT: CHALLENGING THE THROWAWAY SOCIETY 21 (1994).

17. See Council Directive 94/62, 1994 O.J. (L 365) 10, 23 (EC).

18. See *id.* art. 6(b).



experience has also been proven more successful in reducing packaging waste compared to other member states. For instance, U.K. generates packaging waste of 4.6 million tons annually whereas Germany disposes of less than half the amount of rubbish into the ground.<sup>19</sup> For the reasons mentioned above, the following article will discuss the German Packaging Ordinance as the model national law representing all EU member states.

The major four objectives of the German Packaging Ordinance are: (1) Packaging should be made of “environmentally responsible” materials compatible with recycling; (2) The weight and volume of packaging should be minimized; (3) Packaging should be refillable, if feasible; and (4) Packaging should be recycled if it cannot be refilled.<sup>20</sup> The German Packaging Ordinance demands that companies take full legal responsibility to collect and recycle the discarded packaging material. Germany amended the Packaging Ordinance in 1998 by first adopting nationwide recycling and recovery quotas in order to comply with recycling targets required by the EU Packaging Directive.<sup>21</sup> Despite the fact that the Packing Ordinance imposes full legal responsibilities on the private industry to handle their products after consumption; the German Packaging Ordinance provides private industries with leeway to determine whether the specific implementation mechanisms fulfill their legal obligations. For instance, retailers are exempted from the take-back responsibility if their product suppliers have established privately-operated packaging collecting systems that meet material-specific targets for collecting and recycling waste materials as required by law. As a result, many German companies joined the *Duales System Deutschland (DSD)*, which serves as a collective packaging take-back scheme.<sup>22</sup> As a public limited company, DSD collects glass, paper, cardboard, and lightweight materials to fulfill the take-back responsibility of the participating industrial members as required by the Packaging Ordinance.<sup>23</sup> Once participating in the DSD programs, a manufacturer will have the Green Dot label on its products indicating that the consumer should give packaging wastes to DSD instead of returning them to manufacturers.<sup>24</sup>

Shortly after the initial application of the EPR concept in the context of

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19. See Eur. Env't Agency, *Packaging Waste Production Per Capita in Europe*, UNEP/GRID-Arendal (2006), [http://maps.grida.no/go/graphic/packaging\\_waste\\_production\\_per\\_capita\\_](http://maps.grida.no/go/graphic/packaging_waste_production_per_capita_).

20. See Halper, *supra* note 16, at 140; FISHBEIN, *supra* note 16.

21. All EU Member States were obliged to meet at least half of the quotas for 1998 and 1999 and fulfill the entire quota as of the year 2000. See *Recycling and Reuse: Packaging Material: European Union Directive*, US ENVTL. PROTECTION AGENCY (Apr. 2007), <http://www.epa.gov/oswer/international/factsheets/200610-packaging-directives.htm>.

22. FISHBEIN, *supra* note 16, at 50.

23. See Halper, *supra* note 16, at 145.

24. See *id.*; Phase 2 Framework Report, *supra* note 2, at 21.

Packaging Laws, Germany further enacted the “Waste Avoidance, Recovery and Disposal Act” (also called “Eco-Cycle Waste Act”, and the “Closed-Loop Economy Law” (hereinafter Closed-Loop Law) as a national law and policy framework. The objective is to set up an ambitious goal of promoting the optimal use of resources, and minimizing waste originally designated for final disposal in 1994.<sup>25</sup> The Closed-loop law has further elaborated on the EPR and life-cycle approaches by shifting the responsibility of handling products at the post consumer stage from public authorities to manufacturers or importers. The law also provides economic incentives for producers to take into account environmental impacts throughout the life-cycle of a product. This is because the manufacturers in most cases are in a better position to examine their product chain including the raw material selection, methods of obtaining these materials, product distributions methods, and final disposal of such products at their end-of-life stage.

Recognizing the impressive progress made by German law, other Member States basically adopt similar legal measures modeling from German law in tackling packaging waste issues. For instance, the two major piece of legislation in the U.K. dealing with packaging and packaging waste are the Producer Responsibility Obligations (Packaging Waste) Regulations 2007 and the Packaging Regulations 2003. The British legislation came out later than German law. The core purpose of these laws is to adopt a similar approach to as German law, that is, to set up recycling and recovery targets and to provide incentives for minimizing and reusing packaging. Netherland has also enacted the law requiring the government to enter into a negotiation with the private industry in order to reach an agreement to incorporate EPR objectives and implementation measures.<sup>26</sup>

## 2. *EU Directives on Producer Responsibility: WEEE and RoHS Directive*

At the EU level, the EU Council has adopted a resolution that calls for the development of the principle of producer responsibility for waste management.<sup>27</sup> EU then established two prominent directives that aim at addressing e-waste in February 2003. They are the Waste Electrical and Electronic Equipment Directive (hereinafter WEEE Directive) and the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Directive (hereinafter RoHS Directive).<sup>28</sup> These two

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25. See Phase 2 Framework Report, *supra* note 2, at 18.

26. *Id.* at 21-22.

27. See Council Decision 1600/2002, art. 3, 2002 O.J. (L 242) 4 (EC).

28. Press Release, Eur. Comm'n, Commission Welcomes Agreement on Waste Electrical and

Directives shift the full legal responsibility of managing and reducing electronic wastes from the government to manufacturers of electrical products. The WEEE Directive requires manufacturers to take full responsibility of collecting, reusing and recycling e-wastes in environmental friendly manners, either by ecological disposal or by reuse/refurbishment. The RoHS Directive provides restrictions on using hazardous substances in electrical products, and establishes an ambitious goal requiring Member States to phase-out certain hazardous metals (lead, cadmium, mercury, and hexa-valent chromium) in computers and computer accessories by July 1, 2006.<sup>29</sup> Under the WEEE Directive and RoHS Directive, manufacturers in the EU are forced to take back their own products. Although it is most likely that consumers will ultimately bear the costs of these new directives (through increased prices on new products), the WEEE Directive nevertheless provides producers incentives to replace hazardous materials by much safer and easy-to-reuse materials in their products, or to recycle the wasted products.<sup>30</sup>

### C. *U.S.'s Legal Experience*

#### 1. *U.S. Waste Management Laws at a Federal Level*

In comparison with the EU's application of sustainable management concepts in the context of waste management legal framework, waste management in the U.S. remains the responsibility of public authorities that are funded by tax money. The Resource Conservation and Recovery Act (hereinafter RCRA) enacted in 1976 serves as the main legal framework at a federal level that oversees municipal solid waste handling operations from gathering to final disposal.<sup>31</sup> The most notable feature of the RCRA is the adoption of strict and mandatory legal measures to tackle hazardous wastes management disposed within the U.S. jurisdiction. On the other hand, the RCRA does not impose any storage or treatment requirements for exporting solid waste. Many domestic waste managers thus export the waste overseas because the RCRA provides only limited regulation of waste transportation between the U.S. and receiving countries.<sup>32</sup> In regard to e-waste issues, a

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Electronic Equipment and the Restriction of Hazardous Substances (Oct. 11, 2002).

29. *Id.*

30. Rachel Shabi, *The E-Waste Land*, THE GUARDIAN, Nov. 30, 2002, at 36, available at <http://www.hartford-hwp.com/archives/55/702.html>.

31. Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901-6992k (1996).

32. See Theodore Waugh, *Where Do We Go From Here: Legal Controls and Future Strategies for Addressing the Transportation of Hazardous Wastes Across International Borders*, 11 FORDHAM ENVTL. L.J. 477, 483, 490-91 (2000); Betsy M. Billingham, *E-Waste: A Comparative Analysis of Current and Contemplated Management Efforts by the European Union and the United States*, 16 COLO. J. INT'L ENVTL. L. & POL'Y 399, 411 (2005).

comprehensive legal framework scheme is lacking at a federal level that specifically addresses the issues of handling e-waste. The U.S. Congress, however, is discussing the proposed legislation titled “National Computer Recycling Act”, which requires the U.S. EPA to establish grant programs to provide economic incentives for municipalities, individuals, and business organizations to implement e-waste recycling programs.<sup>33</sup> The proposed National Computer Recycling Act mandates the U.S. EPA to charge consumers up to \$10 when purchasing new computers to fund the recycling grant programs.<sup>34</sup> Manufacturers and retailers who have existing recycling programs are exempted from charging the fee.<sup>35</sup> In addition to the National Computer Recycling Bill, the RCRA has also been amended constantly to provide exemptions for exporting materials destined for recycling efforts.<sup>36</sup> Recently, the U.S. EPA is proposing an amendment to the RCRA that would exempt CRTs (cathode ray tubes) from RCRA provisions to encourage recycling and reusing these parts.<sup>37</sup> The main reason for the U.S. EPA to propose such an amendment to the RCRA is because existing EPA regulations treat many lead-containing CRTs as hazardous wastes when they are broken down for the recycling process.<sup>38</sup> As a result, the used CRTs are often considered as solid wastes in RCRA regulations so they are disposed of by landfill instead of recycled.<sup>39</sup> Some commentators argue that the EPA’s proposed changes to the CRT regulations would encourage waste handlers to export the broken CRTs to some developing countries instead of recycling the computer components.<sup>40</sup>

As mentioned earlier, the experience of the European approach has provided successful and valuable lessons for the rest of the world to reference for developing similar programs to achieve waste reduction and sustainable use of resources. In this regard, the US practice is somewhat deficient because the EPR mandates are lacking under the current federal laws. The U.S. federal laws tend to focus on regulating the release of hazardous waste rather than adopting the innovative approach to manage municipal solid wastes. Because of strict legal control of hazardous waste,

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33. The National Computer Recycling Act proposal was first introduced to the House by Representative of California Thompson on Jan. 4, 2007. See National Computer Recycling Act, H. R. 233, 110th Cong. (2007), available at <http://www.opencongress.org/bill/110-h233/text>.

34. See *id.* § 3.

35. See *id.* §§ 3(d), 3(e).

36. See Waugh, *supra* note 32, at 491.

37. See, e.g., Hazardous Waste Management System; Modification of the Hazardous Waste Program; Cathode Ray Tubes and Mercury-Containing Equipment, 67 Fed. Reg. 40, 508 (proposed June 12, 2002) (to be codified at 40 C.F.R. pt. 260, 261, 264, 268, 270, and 273).

38. *Id.* at 40,511, 40,513.

39. *Id.* at 40,511, 40,512.

40. See Lisa T. Belenky, *Cradle to Border: U.S. Hazardous Waste Export Regulations and International Law*, 17 BERKELEY J. INT’L L. 95, 107 (1999); Billingshurst, *supra* note 32, at 411.

U.S. federal laws are aggressive in characterizing solid wastes once they present potential hazards to human health or the environment. In this regard, many e-wastes for instance, may be characterized as hazardous waste and should be disposed of in sanitary landfill or by incineration instead of being recycled. Accordingly, some commentators have called for necessary amendments to the RCRA in order to keep waste handlers from exporting hazardous wastes overseas. These suggestions include: (1) the development of a clear definition of the term “environmentally sound manner.” The law should authorize relevant authorities to determine whether the discarded materials transported internationally are hazardous wastes or municipal solid wastes, and (2) the establishment of a legal regime that specifically deals with waste importations matters.<sup>41</sup> Although the RCRA does not ban the export of domestic e-wastes overseas by manufacturers for the purpose of recycling, some suggest that as long as the law prohibits manufacturers from using certain hazardous waste in their electronic products, the waste exportation nevertheless cause less harm to the environment of receiving countries.<sup>42</sup>

Although there is currently a lack of federal law providing legal basis for developing mandatory EPR programs to specifically address e-waste issues, the U.S. EPA has developed somewhat similar programs known as “Product Stewardship.” It is a voluntary program that overlooks federal government’s dealing with electronic waste disposal. “Product Stewardship” is similar to EU packaging law in reallocating the waste disposal responsibility from customers or taxpayers to a shared responsibility scheme. In other words, waste recycling costs are jointly shared by customers, retailers, product manufacturers, local governments, and volunteer organizations.<sup>43</sup> Volunteer programs like “Product Stewardship” attempt to internalize the cost of disposal to manufacturers by encouraging them to include disposal costs in the price of the product. Moreover, the U.S. EPA has developed several programs for encouraging manufacturers to voluntarily make their products less wasteful and easier to recycle. The most notably program is the “Electronic Product Environmental Assessment Tool”, which is utilized for purchasing electron equipment by federal agencies under the President’s Executive Order.<sup>44</sup>

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41. U.S. GOV’T ACCOUNTABILITY OFFICE, GAO-08-1044, EPA NEEDS TO BETTER CONTROL HARMFUL U.S. EXPORTS THROUGH STRONGER ENFORCEMENT AND MORE COMPREHENSIVE REGULATION 40-41 (2008), available at <http://www.gao.gov/new.items/d081044.pdf>; Pierre Portas, *Commentary: The Basel Convention, Back to the Future*, SUSTAINABLE DEV. L. & POL’Y 38, 40-41 (Spring 2006), available at <http://digitalcommons.wcl.american.edu/sdlp/vol6/iss3/14>.

42. Billingham, *supra* note 32, at 427.

43. See Linda Roeder, *U.S. EPA Launches Campaign to Encourage Collection, Recycling of Electronic Waste*, 26 INT’L ENV’T REP. (BNA) No. 2, at 93 (Jan. 15, 2003).

44. See U.S. GOV’T ACCOUNTABILITY OFFICE, GAO-06-47, ELECTRONIC WASTE:

In sum, the U.S. federal law lacks a comprehensive legal framework for incorporating mandatory EPR policy as well as the establishment of a national recycling objective. Moreover, strict U.S. federal laws concerning hazardous waste has made some U.S. waste handlers choose to export waste overseas for recycling, landfill, or incineration. Thus, it is critical for U.S. policy-makers to come out with effective solutions to prevent U.S. waste handlers to export hazardous material in the name of recycling.

## 2. *State Legislations Play Leading Role: E-Waste as Example*

By contrary to the slow progress made by the U.S. federal government, several states have taken positive steps to tackle e-waste issues. For instance, the State of California in 2003 enacted a new legislation entitled “Electronic Waste Recycling Act” (hereinafter EWRA), which requires manufacturers to eliminate specific hazardous materials from their electronic products by the time the RoHS came into effect (July 1, 2006). Before the EWRA, California had passed a law that banned all CRTs from municipal landfills, and treated the CRTs as hazardous waste. The EWRA, however, fails to provide alternative means for the disposal of household e-waste.<sup>45</sup> Thus, many citizens began to illegally dump their e-waste due to a lack of local electronics recyclers or to avoid fees imposed by local collection agencies.<sup>46</sup> In response, the State of California passed the EWRA on September 25, 2003 to address issues concerning household e-waste disposal. The framework of the EWRA is basically modeled after the EU’s WEEE and RoHS directives. The EWRA creates a comprehensive and innovative system for the reuse, recycling, and proper and legal disposal of covered electronic devices. It also provides incentives for manufacturers to design electronic devices that are less toxic and easier to recycle, and use more recyclable materials.<sup>47</sup> Under the EWRA, manufacturers are obligated to inform consumers about where and how to return, recycle, and dispose of their electronic products.

While the U.S. EPA proposes the amendments to the RCRA allowing local recyclers to recycle and reuse CRTs, the EWRA, by contrast, compels manufacturers to eliminate specific CRTs they use in their electronic products, and further to provide safer products that can be more easily

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STRENGTHENING THE ROLE OF THE FEDERAL GOVERNMENT IN ENCOURAGING RECYCLING AND REUSE 22 (2005) (In addition to EPEAT, there are several e-waste recycling programs operated at federal level, such as Federal Electronics Challenge, and the “Plug-In To e-Cycling” campaign).

45. Nancy Vogel, *Davis Signs Law to Boost TV, Computer Monitor Recycling*, L.A. TIMES, Sept. 26, 2003, at B8.

46. See Anthony DePalma, *Afterlife for Old Computers Is Envisioned in Council Bill*, N.Y. TIMES, May 25, 2005, at B3.

47. 2003 Cal. Adv. Legis. Serv. 526 (Deering).

recycled. Although the EWRA lays down some requirements for producers to design and to produce environmentally friendly electronic products, some critics argue that the EWRA provides no strong incentives for manufacturers to make their products much easier for recycling and safer for consumers because it does not impose take-back requirements on electronic producers.<sup>48</sup> Instead, the EWRA requires manufacturers to collect an up-front recycling fee of about \$6 to \$10 when selling electronic devices. The money collected are deposited in an “Electronic Waste Recovery and Recycling Account” managed by the government. The EWRA provides the government with the authority to distribute the collected fees to electronic waste recyclers and collectors. Because the EWRA only require manufacturers to collect up-front fees, the ultimate waste handling responsibility nevertheless is placed on the consumer because the up-front fee paid by manufactures would be included in the price of the products.

In short, the EWRA does authorize greater government involvement to oversee the e-waste handing process. On the other hand, the EWRA fails to provide strong incentives for manufacturers to design and to produce their products easier to recycle and safer for consumers. In addition to California, several other states have begun to place certain responsibilities for manufacturers to recover and recycle discarded electronics produced by them. For instance, the State of Maine passed the e-waste law that places the burden of cost of e-waste disposal on the manufacturer.<sup>49</sup> The state of Washington also requires manufacturers to pay for the cost of recycling e-waste, which include the expenses of collection, transportation, and processing of electronics discarded by consumers in the State.<sup>50</sup>

### III. TAIWAN’S RECENT LEGAL DEVELOPMENT CONCERNING WASTE MANAGEMENT

#### A. *Background and Basic Framework of the Resource Recycle and Waste Management Act Proposal*

In response to growing population and increasing amount of waste as a result of rapid economic development since the 1980s, Taiwan Environmental Protection Administration (TEPA) was determined to develop waste reduction policy and environmentally sound waste disposal measures by introducing a multiyear “Solid Waste Disposal Plan” in 1998. The main

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48. See Vogel, *supra* note 45; Billingham, *supra* note 32, at 418, 426.

49. Associated Press, *Maine makes TV, PC monitor makers recycle*, MSNBC.COM, (Jan. 18, 2006), [http://www.msnbc.msn.com/id/10910607/ns/us\\_news-environment/t/maine-makes-tv-pc-monitor-makers-recycle/](http://www.msnbc.msn.com/id/10910607/ns/us_news-environment/t/maine-makes-tv-pc-monitor-makers-recycle/) [hereinafter *Maine*]. See also Silvia Spring, *Recycling: This Old Gadget*, HIGHBEAM RESEARCH (Nov. 20, 2006), [www.highbeam.com/doc/1G1-154405917.html](http://www.highbeam.com/doc/1G1-154405917.html).

50. H.D. 6428, 2006 Leg., 59th Reg. Sess. (Wash. 2006).

theme of this plan was to first dispose waste properly and then to establish numerous incineration plants countrywide in order to replace overloaded landfill facilities. The implementation of the plan has achieved some progress with respect to waste management in Taiwan. The statistics reported by TEPA show that 99.71% of municipal solid waste was properly disposed of in 2006 in comparison with only 2.55% in 1984. In addition, incineration has replaced landfill as the principal means of waste disposal; 82.74% of waste was incinerated and only 17.17% was landfill. Although the implementation of the Solid Waste Disposal Plan proved to be successful in replacing open air landfill with incineration, the increasing quantity of waste nevertheless challenges policymakers to address the accompanied air pollution caused by incinerating wastes, and to prioritize waste recycling as the primary waste management measure. Consequently, a series of laws and regulations were developed to achieve the objective of waste reduction. The framework legislation Resource Recovery and Recycle Act (RRRA) and other implementing rules have been enacted or proposed since 2002. The implementation of these law and regulation has resulted in gradual increase of the overall resource recycling rate.

Shortly after the enactment of the RRRA, TEPA began to implement the policy of waste minimization at the source, compulsory garbage sorting, and expanded the scope of waste recycling. The average amount of Municipal Solid Waste (MSW) collected for disposal reached 0.520 kg per capita per day in 2008, a drop of 50.74% from the peak value in 1998. The percentage of MSW that was properly disposed of increased from 60.17% in 1989 to 99.99% in 2008. The recycling rate of MSW increased from 24.01% in 2004 to 41.96% in 2008. The MSW recycled include the resource recycled (32.20%), the kitchen waste recycled (9.17%) and the bulk waste recycled (0.59%).<sup>51</sup> Despite some progress made in recent years, TEPA's waste management policy and legal framework have been criticized for its lack of foresighted planning, sustainable thinking, and proper distribution of administrative resources. Additionally, the international community has gradually adopted the OECD, U.S. and EU's sustainable waste management policies. Taiwan, which is an important trade entity, needs to cope with the international trend by adopting similar waste disposal policies in order to maintain her competitive edge in the international community.<sup>52</sup> Thus, TEPA launched the zero waste program aiming at minimizing waste at the source, promoting green manufacturing, and providing incentives for resource recycling, reuse, and regeneration.

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51. *Management of General Waste*, ENVTL. PROTECTION ADMIN., (Taiwan) (Aug. 4, 2009), <http://www.epa.gov.tw/en/epashow.aspx?list=52&path=163&guid=fbbb159b-a668-45c6-90bf-aa0d7f5115b2&lang=en-us>.

52. See, e.g., Council Directive 2002/96, 2003 O.J. (L 37) 24 (EC).



In 2004, the TEPA formulated a legal task force to propose a new waste management law entitled the bill of “Wasted Resource Closed-Loop Recycling Act” (hereinafter Legal Proposal) that aims at implementing the TEPA’s zero waste policy. The research team conducts comparative legal analysis among the EU, Germany, U.S, and Japan’s legal frameworks incorporating sustainable waste management approaches. The proposed legal measures and underlying legal principles adopted by the Legal Proposal are basically similar to German laws, such as reducing waste at its sources, promoting recycling instead of seeking solid waste disposal, and EPR programs. The main reason for Taiwan to adopt legal approaches similar to German and Japanese law models is partly because Germany, Japan and Taiwan are countries with high population density, export-oriented economic entities with lack of rich natural resources. In this regard, it is critical to deem waste as resources in order to deal with environmental problems such as the lack of landfill facilities, energy-saving for incineration, and overloaded environmental capacities. The U.S, on the other hand, does not have the root for seriously encouraging waste recycling operations. It is partially because the U.S. is a country with broad land spaces, rich natural resources, and a domestic market driven economy. In addition, U.S. environmental laws tend to focus on end-of pipe strategies instead of adopting product-oriented legal approaches to tackle pollution problems at the production process. The implementation of this ideology in the context of waste management leads to the U.S. waste management law imposing strict legal measures to oversee the waste disposal process instead of focusing on the production process.<sup>53</sup> The legal approaches that deal with proper disposal and hazardous waste under the Legal Proposal are basically modelled from the U.S. federal laws. The initial draft of the Legal Proposal was developed and the general public notified for comments in 2005. A series of public meetings, seminars, and workshops were held during the public hearing period. TEPA received many valuable comments from academics, the industry, environmental groups, and the general public. The first draft of the Legal Proposal was finalized in 2006. Due to strong opposition and comments from the industry, public interest groups, and waste management industry unions, the name of Legal Proposal was changed from the original “Wasted Resource Closed-Loop Recycling Act” to “Resource Recycling and Closed-Loop Recycling”, and some changes have been made to certain provisions. The draft legislation has been sent for review by the Executive Yuan since of 29, December 2010.<sup>54</sup>

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53. See Sachs, *supra* note 2, at 52.

54. See *Status of Proposing Legislation under review of Executive Yuan*, ENVTL. PROTECTION ADMIN., (Taiwan) (Sept. 8, 2011), <http://ivy5.epa.gov.tw/epalaw/index.aspx> (last visited Sept. 21, 2011).

## B. *Analysis of Taiwan's Legal Proposal*

### 1. *Establishing An Integrated Waste Management Framework*

The main theme of the Legal Proposal is to integrate two major waste management laws, namely the "Waste Disposal Act" (hereinafter WDA) and the "Resource Recycling and Reuse Act" into a single legal regime. The WDA was first enacted in 1974 and has been amended nine times since then. The 1998 the WDA Amendment established a comprehensive legal framework to provide regulatory authorities to oversee certain waste recycling processes. The WDA first incorporates the EPR concept by authorizing TEPA to determine whether the manufacturer, importer, or retailer of a product is qualified as a product responsible entity for the recycling, clearing, and disposing of such products if it shows the following characteristics: (1) difficult to clear or dispose of, (2) containing a component that does not readily decompose over a long period, or being officially listed as a hazardous substance, and (3) valuable for recycling and reuse.<sup>55</sup> Although the WDA has shifted the burden of handling a product after consumption upward from end-users to manufacturers, it adopts different approaches from those in the German Law. The WDA allows the responsible entity to pay for recycling, cleaning, and disposing the discarded product instead of assigning the responsible entity a full responsibility to collect and recycle the product after consumption as required by German law. In this regard, the WDA's approach is considered much more similar to the product responsibility scheme adopted by the U.S. model. The WDA also authorizes TEPA to establish the Resource Recycling Management Fund to collect payments from the responsible entity. The fee rates for recycling, cleaning, and disposing products are approved quarterly by TEPA on the basis of manufacturing volume for the current quarter, and importing volume reported to customs.<sup>56</sup> The WDA also authorizes TEPA to develop an inventory system for listing certain materials that are required to be recycled, such as glass, beverage cans, paper, and e-waste, among many others.<sup>57</sup>

On the other hand, the main purposes of the RRRRA is to establish a well-defined objective of waste handling priority in order to provide comprehensive economic incentives for promoting the recycling technology, and expanding the domestic market for the recycled products.<sup>58</sup> Moreover,

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55. See Waste Disposal Act, (1974) (amended 2006) (Taiwan), available at <http://law.moj.gov.tw/Eng/LawClass/LawContent.aspx?PCODE=O0050001>.

56. See *id.* arts. 16-17.

57. TEPA has announced several mandatory recycled products, such as glass, beverage cans, articles, e-waste, and etc. See *id.* arts. 16-17.

58. See Resource Recycling Act Enforcement Rules, arts. 6, 22, 24, (2003) (amended 2011) (Taiwan), available at <http://law.moj.gov.tw/Eng/LawClass/LawContent.aspx?PCODE=O0050076>.

the “Resource Recycling and Reuse Act” (hereinafter RRRRA) authorizes TEPA to ban or to limit the use of certain paper, containers, and packaging, and further to mandate TEPA to issue regulation banning a certain product’s manufacturers and importers from using excessive package.<sup>59</sup> Although both the WDA and RRRRA are effective legislation to date, they are somewhat difficult to implement. Because both the WDA and RRRRA regulate and oversee domestic recycling operations, some legal terms used in the WDA and RRRRA create confusion when implementing the laws. For instance, the use of the term “renewable resources” and “recycled products” in the RRRRA, and “recyclable waste” in the WDA makes it difficult in distinguishing the legal authorities specified in these two legislations. In addition, both legislations have provided separate institutional and funding schemes that will undermine the overall recycling success. WDA authorizes the establishment of the “Recycling Management Fund” which is responsible for handling the receipt and reimbursement of recycling fees, fee rate determination, and subsidizing and promoting local governments in developing resource recycling programs. The fees are collected from manufacturers and transferred to and managed by the “Recycling Management Fund.”<sup>60</sup> Meanwhile, the RRRRA authorizes the establishment of the “Resource Recovery and Recycle Promotion Committee”, which shares the identical function as the Recycling Management Fund in formulating resource recycling policies, and developing implementation programs. Moreover, the WDA and RRRRA both authorize TEPA to impose the ban or restriction on manufacturing, importing, selling and reusing some products if they may cause a serious concern of pollution problems.<sup>61</sup> Because both the WDA and RRRRA provide similar restrictions on regulating hazardous materials, TEPA may be perplexed concerning which law should be implemented when dealing with materials, packaging and containers that may pose threats to the environment and human health.

In short, the implementation of the RRRRA and WDA is somehow troublesome because of overlapping regulatory authorities.<sup>62</sup> In response to criticisms about troublesome procedures and overlapping regulatory authorities in implementing the WDA and RRRRA, the Legal Proposal is hence developed to integrate the WDA and RRRRA into a single

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59. *See id.* art. 14.

60. *See id.* art. 16.

61. Waste Disposal Act, art. 21, (1974) (amended 2006) (Taiwan), available at <http://law.moj.gov.tw/Eng/LawClass/LawContent.aspx?PCODE=O0050001>; Resource Recycling Act Enforcement Rules, art. 13, (2003) (amended 2011) (Taiwan), available at <http://law.moj.gov.tw/Eng/LawClass/LawContent.aspx?PCODE=O0050076>.

62. *See* TZU-YANG CHEN, HUANCHINGFA KELUN (ERH)-FEICHI WUCHIH HSUNHUAN CHINGLI FACHIH CHIH YENCHIU [A STUDY OF WASTE MATERIAL CLOSED-LOOP RECYCLING MANAGEMENT LAWS] 36-37 (2007).

comprehensive legal framework for regulating materials throughout their lifecycle. In others words, the Legal Proposal stipulates that the non-recyclable portion of a material be disposed of and the recyclable-portion be recycled and reused after their consumption. Moreover, the Legal Proposal creates a single legal authority by integrating two separated regulatory systems. For instance, TEPA is authorized to create a new institution known as the Waste Materials Recycling Promotion Board, which takes over the legal authority and missions from the Resource Recovery and Recycle Promotion Committee under the RRRRA, and the Recycling Management Fund under the WDA. Specifically, the Waste Materials Recycling Promotion Board would be responsible for developing a nationwide waste management policy on recycling rates, and subsidy policy.

## 2. *Reconstruct Waste Handling Priority Based on Lifecycle Analysis*

The Legal Proposal incorporates several sustainable and innovative waste management approaches, such as the 4R principles, minimizing waste at its source, and the EPR concept in an attempt to achieve the objective of zero waste disposal.<sup>63</sup> It reconstructs the waste handling priority order by not emphasizing waste disposal but encouraging the reuse and recycling of waste. In other words, the Legal Proposal first seeks to reduce waste generation at the source, and then requires manufacturers and importers to achieve the upmost reuse and recycling of the products after its consumption. Finally, for those materials that—are economically or technologically unfeasible for recycling, they should be disposed of in environmentally sound manners.<sup>64</sup> With respect to the final disposal, the Legal Proposal specifically prohibits waste handlers to dump waste in open air. Moreover, the Legal Proposal no longer requires enterprises or small businesses to sign waste disposal contracts with certified waste handlers. A small number of household hazardous wastes (e.g. oil paint cans) and solid wastes generated by household or small enterprises are allowed to be collected by local authority.

In short, the Legal Proposal requires the lowest cost avoiders,<sup>65</sup> which in most cases are manufacturers, to make products that can prevent or at

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63. *See id.* at 123-25.

64. *See* Feichi Tzuyuan Hsunhuan Tsuchin Fa Tsaiian [Waste Closed-Loop Recycling Bill], art. 8, (2010) (Taiwan), available at <http://atftp.epa.gov.tw/pub/098/H0/17833/%E5%BB%A2%E6%A3%84%E8%B3%87%E6%BA%90%E5%BE%AA%E7%92%B0%E4%BF%83%E9%80%B2%E6%B3%95%E9%80%90%E6%A2%9D-%E5%85%AC%E8%81%BD%E6%9C%83.doc>.

65. As for discuss the idea of cheapest cost avoiders, *see* Guido Calabresi & A. Douglas Malamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1096-97 (1972); James Salzman, *Beyond the Smokestack: Environmental Protection in the Service Economy*, 47 UCLA L. REV. 411, 479-80 (2000).

least reduce the generation of waste. Moreover, manufacturers are required to design their products safer and easier to recycle. The Legal Proposal also classifies wastes that can be finally disposed of without recycling. In Taiwan, nearly 90% of waste designated for final disposal are incinerated. Recognizing the potential benefits of upgrading existing incineration facilities for recovering heat, the Legal Proposal requires that all incineration operations adopt the “Waste-To-Energy” program (hereinafter WTE), which converts heat from incinerating waste into electricity. The potential benefits of implementing WTE include not only saving the landfill space but also reducing greenhouse gas emission and petroleum fuel consumption.<sup>66</sup> Because a high proportion of waste disposal in Taiwan depends on incineration, the Legal Proposal authorizes the Waste Materials Recycling Promotion Board to develop the minimum heat production standard annually.<sup>67</sup> In this regard, all materials after consumption should be considered resources instead of wastes in the context of the Legal Proposal, because even the waste designed for final disposal has the capacity for recovering heat. It is expected that once the Legal Proposal is implemented, WTE and some other sustainable waste management measures, such as enhancing a product’s upstream management, developing mandatory and voluntary reuse and recycle programs would be fully supported by law. In other words, if the Legal Proposal can be implemented and fully supported by the general public and enterprises, the core principle of recent TEPA waste management policies, such as the zero waste policy and its ultimate goal for establishing a resource closed-loop recycling society, can one day to be achieved.

### 3. *Incorporation of the EPR Concept in the Legal Proposal*

Recognizing the importance of enhancing manufacturer and importers’ responsibility for handling their products throughout the life cycle of each product, the EPR concept has been incorporated in the context of the Legal Proposal that shifts the waste handling responsibility to manufacturers of certain products designated as the product-responsible organizations throughout the entire lifecycle of such a product. The Legal Proposal requires manufacturers to take into account the minimization of waste,

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66. Nickolas J. Themelis, *An Overview of the Global Waste-to-Energy Industry*, INTERNATIONAL SOLID WASTE ASSOCIATION (July-August, 2003), [http://www.seas.columbia.edu/earth/papers/global\\_waste\\_to\\_energy.html](http://www.seas.columbia.edu/earth/papers/global_waste_to_energy.html).

67. See Feichi Tzuyuan Hsunhuan Tsuchin Fa Tsaian [Waste Closed-Loop Recycling Bill], art. 2, (2010) (Taiwan), *available at* <http://atftp.epa.gov.tw/pub/098/H0/17833/%E5%BB%A2%E6%A3%84%E8%B3%87%E6%BA%90%E5%BE%AA%E7%92%B0%E4%BF%83%E9%80%B2%E6%B3%95%E9%80%90%E6%A2%9D-%E5%85%AC%E8%81%BD%E6%9C%83.doc>.

prohibition of hazardous materials, application of clean production technology, and re-use of certain percentage recycled raw materials.<sup>68</sup> Moreover, the Legal Proposal also requires that important waste handling information shall be provided on a product's label, such as the proportion of recycled and raw materials used in the product and methods of reuse or recycling after consumption.<sup>69</sup> Once a product or a material reaches its end-of-life stage, manufacturers are required to reuse or to recycle the waste at a rate no less than the mandatory recycling rate.

As mentioned earlier, the Legal Proposal deems all materials as resources, and only under certain conditions allows the consumed products to be designated for final disposal. In the case that a certain material fails the technological feasibility test, and the economic feasibility test, or the recycling operation may cause more harm than good to the environment,<sup>64</sup> the product manufacturers can then apply for final disposal of such waste material rather than reusing or recycling them. The Legal Proposal also emphasizes the responsibility of manufacturers and importers for properly handling of packaging wastes. Firstly, the Legal Proposal authorizes TEPA to develop a phase-out list for certain hazardous materials, and some packaging or containers if they present health risks during the production or waste handling processes. The Legal Proposal provides the TEPA a broad legal authority to eliminate hazardous materials used in some products, such as computer components and parts, as required by the EU's RoHs Directive. Secondly, the Legal Proposal mandates TEPA to promulgate regulation concerning the restriction on use of excessive packaging. Manufacturers are required to be compliant with standards established under the regulation, such as packing space, packing layers, and the amount of certain regulated materials used in packaging.<sup>70</sup> This positive approach to prevent oversize or unnecessary waste of natural resources is expected to provide product manufacturers strong incentives to comply with laws instead of enticing customers in Taiwan into buying products by providing luxurious and exotic packaging and wrapping especially for gifts.

Basically, the Legal Proposal adopts the EU legal approach by shifting the waste handling responsibility from taxpayers to manufacturers and importers. By shouldering the full waste handling responsibility on manufacturers and importers, incentives for manufacturers to seek for safer and recyclable designs of products will be provided.<sup>71</sup> The implementation of the EPR program in the context of the Legal Proposal is basically similar to German law but with minor changes. Firstly, the EPR does not apply to all

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68. *See id.* art. 23.

69. *See id.* art. 24.

70. *Id.* art. 25.

71. *Id.* arts. 23-32.

product manufacturers or importers. The EPR under the Legal Proposal only applies to those manufacturers or importers that have been officially announced by TEPA as the “product-responsible organizations.” In other words, TEPA will be authorized to determine the scope of EPR programs. In accordance to the TEPA’s previous practice, only big companies are potentially announced as “product responsible organizations”. It is notable that the Legal Proposal also mandates TEPA to offer certain product-responsible organizations exemptions from fulfilling their take-back responsibilities under some circumstances.<sup>72</sup> In regards to the take-back responsibilities, the Legal Proposal requires product responsible organizations to provide collection sites and competent facilities to fulfill their take-back responsibilities.<sup>73</sup> Secondly, the Legal Proposal adopts a guarantee deposit scheme, which requires the responsible organizations to pre-pay a deposit to TEPA in order to guarantee financially that their legal responsibilities will be fulfilled.<sup>74</sup> The Legal Proposal authorizes the TEPA to establish the “Responsible Waste Material Cleanup Trust Fund” for depositing and managing the fund.<sup>75</sup> The product-responsible organizations can apply for reimbursement from the Responsible Waste Material Cleanup Trust Fund after they achieve the mandatory recycling rate. It is notable that once the product responsible organizations go beyond the reuse or recycling rate required by law, they will even be rewarded by the aforementioned funding.<sup>76</sup> On the other hand, if the product-responsible organizations fail to achieve the mandatory reuse or recycling rate, they will be penalized by fines, and their deposit balance will automatically be deducted to contribute to the rewards offered to other organizations for superior performance.<sup>77</sup>

#### 4. *Providing Comprehensive Economic Incentives to Encourage Waste Minimization*

Although the Legal Proposal shifts the waste-handling responsibility upstream to manufacturers and importers, small and medium businesses, as mentioned earlier, may not be deemed as “product-responsible organizations” and thus in most cases are exempted from the Legal Proposal’s EPR requirements. Recognizing that only a small fraction of manufacturers, importers or retailers are subject to the EPR program, the Legal Proposal provides a comprehensive economic incentives framework to

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72. *Id.* art. 32.

73. *Id.* art. 43.

74. *Id.* art. 45.

75. *Id.*

76. *Id.* art. 36.

77. *Id.* art. 45.

increase the overall reuse and recycling rate. Firstly, the Legal Proposal establishes an eco-labeling scheme operated by TEPA. It authorizes TEPA to establish the Eco-labeling Certified Committee, which determines whether to issue certification for companies depending on whether its product meets ISO-14000 standards, or presents highly recyclable, low pollution emitting, energy saving, and high proportion of re-used and recycled materials for raw materials or components.<sup>78</sup> To encourage the widespread use of eco-labeling products, the Legal Proposal requires government agencies, public schools, the military, and public owned enterprises to purchase a certain proportion of procurement products that are eco-label certified.<sup>79</sup> In addition, the Legal Proposal mandates TEPA to cooperate with the Department of Treasury in developing regulations or amending existing tax laws to provide direct tax incentives for developing reuse and recycling technology and other economical incentives, such as landfill tax, mandatory environmental liability insurance scheme, among many others.<sup>80</sup>

In response to the resource recycling industry's demand, TEPA proposed a plan for establishing Environmental Science and Technology Parks to promote resource recycling technology research and development in 2001. The proposal was approved by the Executive Yuan on 9, September 2002, and was revised on 11, March 2004. The approved budget for promoting and constructing Environmental Science and Technology Parks nationwide is 62 million NT dollars. For implementing the plan, the Legal Proposal requires TEPA to work with the Department of Treasury to develop financial plans for supporting local governments. The main purpose of the financial support plans is to provide financial basis for establishing sustainable and ecological parks at the local government level. Local governments provide lands and recruit tenants in return. More importantly, the Legal Proposal removes many legal obstacles under the existing urban planning laws and thus provides strong incentives for promoting Environmental Science and Technology Parks programs in the future. So far, there are currently four Environmental Science and Technology Parks undergoing planning and construction across the nation.<sup>81</sup>

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78. *Id.* art. 30.

79. *Id.* art. 31.

80. *Id.* art. 80.

81. See Shiung-Wen Chen, *Huanpao Kechi Yuenchu Weilai Chih Tuitung yu Chanwang* [The Prospect and Future Promotion of Environmental Science and Technology Parks(ESTPs) in Taiwan], 24 KUNGAN HUANPAO PAOTAO [SAFETY, HEALTH AND ENVIRONMENT TODAY] 3, 3-5 (2004); Env'tl. Protection Admin., (Taiwan), *Undergoing ESTP Projects*, ESTP BUS. PROJECT, <http://ivy1.epa.gov.tw/estp/en/plan.htm>.



#### IV. SOME OBSERVATIONS AND RECOMMENDATIONS FOR FUTURE LEGAL DEVELOPMENT OF SUSTAINABLE WASTE MANAGEMENT

##### A. *Establishing Mandatory EPR Programs*

As discussed earlier in this article, there are different degrees of potential approaches to implementing EPR programs, ranging from mandatory, collaborative, to fully voluntary measures. This article suggests that by only incorporating mandatory EPR programs in the legal framework, the policy objective of establishing a resource closed-loop recycling system can be achieved. After examining the U.S, EU, and Taiwan's legal framework, this article finds that fully voluntary programs could only achieve limited success in increasing the reuse and recycling rate compared with mandatory or public/private cooperation schemes. This is evident by the application of the EPR concept in the context of packaging laws in Germany, France and Belgium in the early 1990s. Because these laws only adopted a fully voluntary program, they failed to substantially increase the material re-use and recycling rate.<sup>82</sup> In response to slow progress made by voluntary EPR programs, Germany and the Netherlands revised their packaging legislation to establish mandatory, more inclusive, free riders-controlled EPR programs. Recognizing the necessity of establishing mandatory EPR in the context of waste management legal framework, the EU set up a clear timeline and recycling target for all Member States to comply with by 2006.<sup>83</sup> As for the U.S., U.S. EPA has adopted numerous EPR experiments but all of them are voluntary programs. Thus, the development of mandatory EPR programs at the federal level in the United States is expected to be unrealistic at least in the near future. This is arguably due to the legal authority provided by U.S. federal waste law. As mentioned earlier, the U.S. RCRA does not delegate authority to the federal government to regulate municipal solid waste. Federal laws address mostly the proper waste disposal standards and hazardous waste management. Thus, only states have legal authority and are in a better position to develop mandatory EPR programs. In practice, some state legislation such as California and Maine are beginning to take a lead in adopting EPR programs and other sustainable waste management measures that aim at increasing the recycling rate and waste reduction. Thus, the first mandatory EPR programs or recycling rate is expected to be implemented in state law instead of federal legislation.

Learning from the success of implementing mandatory EPR programs in the EU, the Legal Proposal authorizes TEPA to develop mandatory recycling

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82. James Salzman, *Sustainable Consumption and the Law*, 27 ENVTL. L. 1243 (1997).

83. See Council Directive 94/62, 1994 O.J. (L 365) 10-23 (EC).

and reuse rates for certain products. Manufacturers are required to pay a deposit to guarantee the fulfillment of their legal responsibility, or they will be penalized by paying the administrative fine. In comparison with the existing waste management law, a greater success is expected to increase the reuse and recycling rate once the Legal Proposal goes into effect. There are, however, growing concerns that internalizing recycling costs may reduce the competitiveness of certain products in international markets. In this regard, manufacturing industry and waste handlers vigorously objected to the adoption of mandatory EPR programs during the public hearing period. These objections have successfully attracted political attention in Taiwan. The future direction for establishing mandatory EPR programs is thus unpredictable.

In short, German law and the Legal Proposal adopt similar EPR approaches to regulate manufacturers. Both have shown political determination to establish mandatory, high recycling quotas for manufacturers to comply with in the face of strong opposition from the industry. Although the adoption of mandatory EPR programs is considered as an effective mechanism to achieve waste minimization objectives, there are still some challenges that policy-makers will need to cope with in the future. Firstly, an effective enforcement scheme will need to be established to ensure manufacturers fulfill their legal responsibility, and to control free-riders. As mentioned earlier, the establishment of a deposit guarantees funding scheme in the Legal Proposal provides a model enforcement mechanism for waste policymakers. Secondly, the expansion of the reuse and recycling market as a result of implementing closed-loop economy laws and policies may create some problems for the industry currently operating existing landfill and incinerator facilities. Once reuse and recycling rate increase dramatically, the quantity of waste that is designated for final disposal will be greatly reduced. In this regards, competent authorities shall provide direct tax incentives or for waste handlers to transform their role from waste handlers to recycling operators or recycling technology promoters before the implementation of any mandatory EPR program.

B. *Shifting the Recover and Recycle Responsibility to Manufacturers Instead of Collective Waste Handling Responsibility Systems*

The idea of shifting the waste handling responsibility to manufacturers is to provide strong incentives for manufacturers to take into account environmental considerations when making products. In other words, manufacturers are encouraged to make products recyclable and less hazardous to the environment in order to reduce recycling costs. In this regard, shifting the waste handling responsibility to manufactures provide a

win-win situation for the industry and the environment. In response to the industry's concerns regarding the financial burden as a result of the take-back requirements, OECD has suggested that the governments should first avoid developing detailed regulation on how to achieve the performance goals or targets. Secondly, governments should allow the private sector to devise self-regulating means and solutions for achieving the goal even if the EPR programs are mandatory. Moreover, competent authorities could provide manufacturers with direct subsidies or tax incentives for achieving mandatory recycling rates in order to decrease the financial burden of manufacturers for a period of time shortly after the mandatory EPR program goes into effect.

In comparison with the U.S. and Taiwan's initiatives, the EU's WEEE Directive compels manufacturers in the EU to take back their own products. While the German laws and Taiwan's Legal proposal have both adopted the model of shifting full waste handling responsibility from taxpayers to manufactures, U.S. laws allow manufacturers to choose from recycling on their own or to pay the up-front service fee. As a result, EU laws appear to have given stronger incentives for manufacturers to design products that are safer and easier to recycle. On the other hand, U.S.'s EPR in action, represented by the California's EWRA, means that manufacturers are only required to pay an up-front fee. Unlike EU laws and the Legal Proposal, the EWRA provides little incentive to manufacturers to design safer and eco-friendly products.<sup>84</sup> Although there are differences between countries with respect to political and economic environment, governments should seek to form a consensus between all stakeholders to establish an ideal EPR scheme that is most workable domestically.

### C. *Preventing Illegal Disposal of Hazardous Waste for the Purpose of Recycling*

It is critical that reconstructing the waste handling priority from disposal to seeking upmost recycling of waste also consider the possibilities of waste handlers to export hazardous waste for the purpose of recycling. As mentioned earlier, the U.S. RCRA has been amended constantly to provide exemptions allowing recyclers to export hazardous waste for the purpose of recycling. Accordingly, any domestic law that aims at achieving waste minimization, especially for those setting mandatory recycling quotas or targets should also consider the possibility that manufacturers may be encouraged or forced to export products that contain hazardous materials for

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84. Billingham, *supra* note 32, at 426; Heather L. Drayton, *Economics of Electronic Waste Disposal Regulations*, 36 HOFSTRA L. REV. 149, 171 (2007).

the purpose of recycling. Although some hazardous waste can be recycled because of technological advancement, domestic law should consider the consequences of losing control of exporting hazardous waste for the purpose of recycling. Once some domestic laws allow certain hazardous waste to be exported for the purpose of recycling, it could create loopholes or obstacles for international oversight of illegal dumping of hazardous waste to some developing countries.<sup>85</sup> Accordingly, the Legal Proposal specifically bans all wastes, regardless of whether they have been classified as hazardous or not, to be exported to non-OECD countries. EU and U.S. regulations concerning the trans-boundary shipment of hazardous waste, on the other hand, allow certain hazardous waste to be exported to non-OECD nations or regions under some circumstances.<sup>86</sup> Hence, domestic laws should establish a criteria or monitoring mechanisms for manufacturers to export hazardous waste in the name of recycling. One way of doing this is that domestic laws could impose bans on manufacturers against the use of certain hazardous materials in their products. In doing so, when those solid wastes are shipped to the receiving country for the purpose of recycling, the products containing less hazardous materials will at least cause less harm to the environment of the receiving countries.<sup>87</sup>

#### V. CONCLUSION

The environmental impact as a result of global climate changes has become more apparent and fierce. Global warming has caused speedy melting of icebergs in the South Pole, enhancing the frequency and strength of tropical storms, desertification and uneven rain distribution among many other natural disasters. Taiwan, for instance, has just suffered from tropical storm Morakot, which took hundreds of human lives and caused property damages in mid-August, 2009. In the face of global climate change, policymakers need to avoid unnecessary consumption of natural resources and energy, and seek innovative and effective environmentally sound approaches for addressing environmental issues such as greenhouse gas emission, industrial pollution, soil and ground water contamination, and waste management. The growing population and consumption of natural resources since WWII have not only sped up the consumption of natural resources but also increased the amount of waste generated, and thus placed a heavy burden on waste managers to seek proper landfill sites. Therefore, there is an urgent need to seek environmentally sound waste management

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85. See JIM PUCKETT ET AL., EXPORTING HARM: THE HIGH-TECH TRASHING OF ASIA 28 (2002).

86. Council Regulation 1420/1999, 1999 O.J. 166, 6-28 (EC); OMB Approvals under the Paperwork Reduction act, 40 C.F.R. Part 9 (2010).

87. Billingham, *supra* note 32, at 426-27.

approaches that aim at achieving sustainable production and consumption goals. Traditionally, waste management adopted the “end-of-pipe” strategies that deal with how to properly dispose of waste.

As discussed in this article, EPR programs coupled with integrated product policy have been incorporated in waste policy initiatives and the legal framework in many countries or regions. By shifting the responsibility of waste handling upstream to product manufacturers, manufacturers are required to mitigate the environmental impacts of a product throughout its lifecycle. In doing so, the implementation of zero waste policy in Taiwan is required by existing laws, and has made some progress in approaching the ultimate goal of establishing a “Resource Closed-Loop Recycling Society.” The statistical data published by TEPA show that the MSW recycling rate reached 38.70% by the end of 2007. The overall MSW clearance volume has dropped from 16,877 tons/day in 2003 to 13,354 tons/day in 2007. The daily per capita garbage clearance volume dropped from 0.752 kg/day in 2003 to 0.583 kg/day in 2007.<sup>88</sup> EU, U.S. and Taiwan’s experiences in developing sustainable waste management approaches have shown the potential for changing traditional resource consumption patterns. The establishment of environmentally sound management of waste can not only protect environmental and public health but also save energy use and maintain sustainable use of non renewable natural resources. In doing so, the incorporation of the 4R principles as well as EPR programs in the context of waste management legal framework is perhaps the most practical approach to achieving that goal.

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88. *Zero Waste and Resource Recycling Promotion*, ENVTL. PROTECTION ADMIN., (Taiwan) (Apr. 14, 2010), <http://www.epa.gov.tw/en/epashow.aspx?list=52&path=12305&guid=54ed0a74-3dc5-42c5-9250-0fbf51f92dc3&lang=en-us>.

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# 廢棄資源循環利用法制與政策分析 ——以歐美立法經驗對台灣借鏡 為探討中心

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## 摘 要

高度的都市化與工業化雖然大幅提昇國民之物質生活水平，相對的也造成數量驚人的工業廢棄物與生活垃圾。為能妥善處置每日生產的數量龐大的生活垃圾與具有毒性的工業廢棄物，相對的將必須不斷尋覓需地面積廣大的掩埋場，廢棄物處理技術的限制亦可能造成土壤與地下水污染問題，嚴重威脅民眾生命與健康安全。有鑑於廢棄物處置所造就的嚴重環境與健康問題，近年來許多先進國家開始推動廢棄物永續利用的4R原則，亦即廢棄物減量、資源回收、資源再使用與再生利用四大原則。此外，為能強化產品消費後得以進入循環利用體系取代廢棄物末端處置的目標，商品製造者延伸責任的推動亦成為目前國際間相當獲得重視與討論的概念。

基於地窄人稠與嚴重缺乏天然資源的地理與人文特性，台灣勢必順應國際潮流，將4R原則與商品製造者延長責任等理念納入廢棄物處理法制之中。本文將以台灣環境保護署於2005年所擬定的「資源循環利用法」草案為中心。從比較法觀點分別介紹與分析歐盟與美國的永續廢棄物管理法制的實踐經驗，及台灣「資源循環利用法」草案之立法架構與主要規範內容。最後，本文將以上述的法實踐經驗予以比較觀察後，提出未來建立理想永續資源循環利用法制的具體建議。

**關鍵詞：**資源循環利用、廢棄物清理、商品製造者延長責任、4R原則、零廢棄