

# Program Services: Prevention and Upstream



# 8

## 8. Program Services: Prevention and Upstream

When first developed in the late 1980's, and launched in the early 1990s, the Program had, as one of its primary drivers, the need to provide collection services for household hazardous waste (HHW) and small quantities of hazardous waste generated by businesses and institutions (SQGs), which could not otherwise be reduced.<sup>1</sup> It intended to increase collection services and construct additional facilities over time.<sup>2</sup> As time passed, products containing hazardous components proliferated. Staff also realized that providing more collection services and facilities was not sustainable, and that providing those services might actually increase the demand for and use of hazardous products. What was needed was a structural incentive for reducing the purchase and use of hazardous chemicals.

To address this issue, the Program adopted a prevention and 'upstream' focus that attempts to address HHW and SQG wastes before they become wastes. This strategy addresses a product at the design and manufacturing phases of its development, rather than looking only at the product's disposal at the end of its useful life. This change in the Program's direction reflects major changes in the history of waste and consumer products.

### 8.1. Changes in the Waste Stream Composition

Society's wastes have dramatically changed over time. In 1900, the United States' waste stream was mostly mineral, composed of wood and coal ash, and organic, from food scraps. Over time, product waste has grown relative to other waste types, so that today product and packaging wastes make up 75 percent of the municipal solid waste stream.

Products today also contain different materials and chemicals compared to earlier products. In addition to the long-standing problems of lead and mercury in products and manufacturing processes, there are now many new chemicals. Brominated flame-retardants, potential endocrine-disrupting chemicals like bisphenol-A, antimicrobial additives such as triclosan, and a myriad of other hazardous ingredients are either products themselves or components of products in everyday use. The United States produces and imports approximately 42 billion pounds of chemicals every day, equivalent in liquid volume to 623,000 tanker trucks.<sup>3</sup> In addition, approximately 82,000 different synthetic chemicals are currently in use in the United States,<sup>4</sup> and 85 percent of producer notices to EPA for new chemicals lack health effects data.<sup>5</sup>

1 1990 Final Plan, page 1 of the Forward.

2 1990 Final Plan, pp. 9 and 11.

3 Michael Wilson, Daniel Chia and Bryan Ehlers, *Green Chemistry in California: A Framework for Leadership in Chemicals Policy and Innovation*, (Berkeley, California: California Policy Research Center, University of California, CPRC Brief, Vol. 18, No. 2, May 2006); cited hereafter as *Green Chemistry Framework 2006*.

4 *Green Chemistry Framework 2006*.

5 Michael Wilson, Megan Schwarzman, Timothy Malloy, Elinor Fanning, and Peter Sinsheimer, *Green Chemistry: Cornerstone to a Sustainable California*, (Berkeley California: Centers for Occupational and Environmental Health, University of California, 2008); cited hereafter as *Green Chemistry Cornerstone 2008*.

Figure 8 – 1 Source: U. S. Environmental Protection Agency



Figure 8 – 2 Source: U. S. Environmental Protection Agency



The federal law that regulates these chemicals is the Toxic Substances Control Act (TSCA), enacted in 1976 to address chemicals like DDT and PCBs. A large number of chemicals were grandfathered in under TSCA and considered safe as used even though they had not received thorough safety testing. When TSCA was enacted, 62,000 chemicals were grandfathered in and considered safe as used, despite a lack of complete safety data,<sup>6</sup> and even new chemicals are not fully examined for toxicity.<sup>7</sup> This lack of health safety testing is not widely known by the public, who assume that consumer products are generally safe. Additionally, producers are not required to disclose all the chemicals in their products and often do not make disclosures due to the proprietary nature of that information.

## 8.2. Working ‘Upstream’ and Producer Responsibility

The term “upstream” refers to working higher up a waste stream to address the sources of the waste, rather than focusing only on the waste product itself. Ideally, this approach leads to fewer hazardous constituents in products, or to changes in products that make them non-hazardous and diverts them from the hazardous waste stream altogether. One example of working ‘upstream’ is known as “product stewardship” or “extended producer responsibility.” This approach shifts the cost of disposing of a product at the end of its life from local government and ratepayers to the producers and consumers of the product. Currently, most products externalize disposal costs onto governments and their funders. Product stewardship and extended producer responsibility systems internalize management and disposal costs so that these are passed on to consumers, through the cost of the products.

A product stewardship approach moves attention upstream—from waste to product—by shifting the cost burden for management and disposal of the product to its producers, thus incentivizing producers to reduce the now internalized costs through product redesign. The redesign strives to keep the product cost as low as possible for the consumer, to maintain a competitive edge against other products, and to maintain profit. That financial incentive should drive manufacturers to design products with low end-of-life disposal costs—that is, products that have fewer hazardous constituents.

### 8.2.1. Cradle-to-cradle Approaches

Taken to its logical conclusion, extended producer responsibility would reduce not only hazardous wastes, but waste in general. This is known as moving from “cradle-to-grave” thinking to a “cradle-to-cradle” approach, as articulated by William McDonough and Michael Braungart in their book, *Cradle to Cradle*.<sup>8</sup> In essence, McDonough and Braungart propose that society move away from products that are disposable-by-design and towards products designed to be either fully biodegradable or easily recyclable while retaining their material quality or original characteristics. That quality maintenance ensures the product’s re-use in multiple new products through their full life cycles.

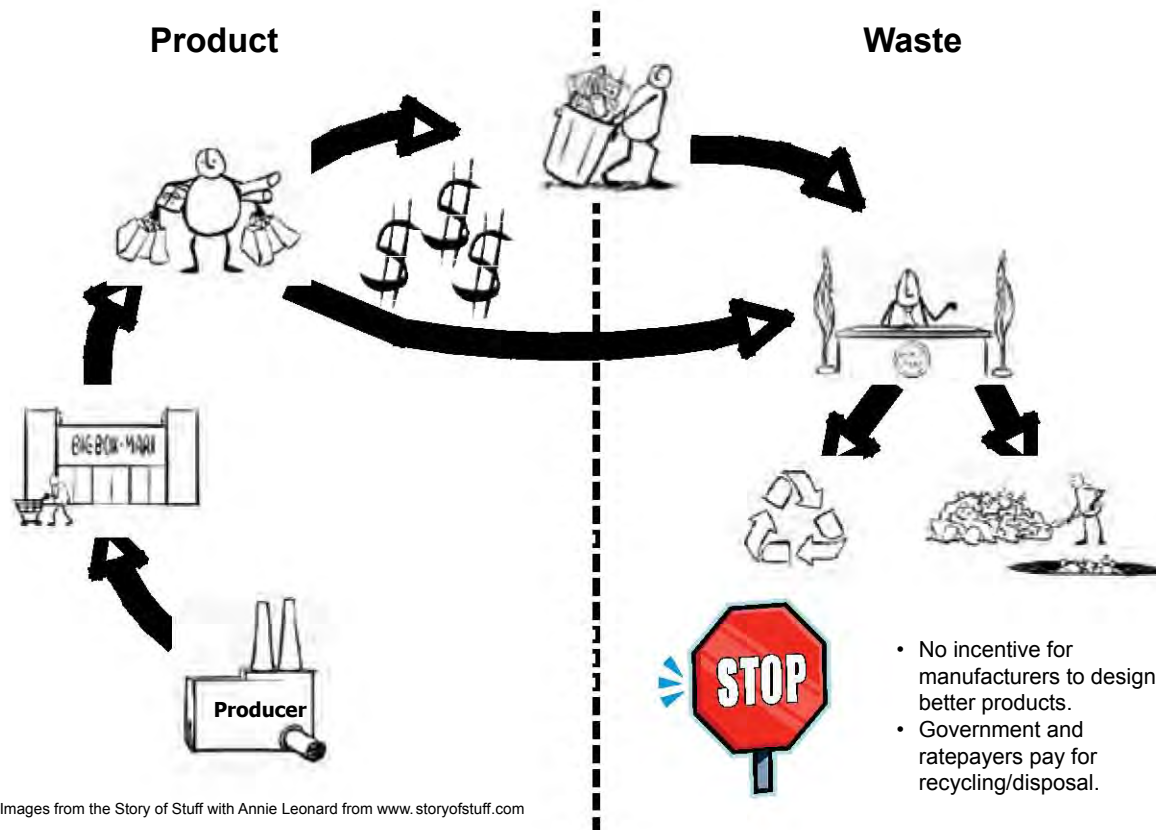
<sup>6</sup> *Green Chemistry Cornerstone 2008*.

<sup>7</sup> *Green Chemistry Cornerstone 2008*.

<sup>8</sup> William McDonough and Michael Braungart, *Cradle-to-Cradle: Remaking the Way We Make Things*, (New York: North Point Press, 2002). Cited hereafter as *Cradle to Cradle*.

Figure 8-3

### Yesterday's Waste Management System

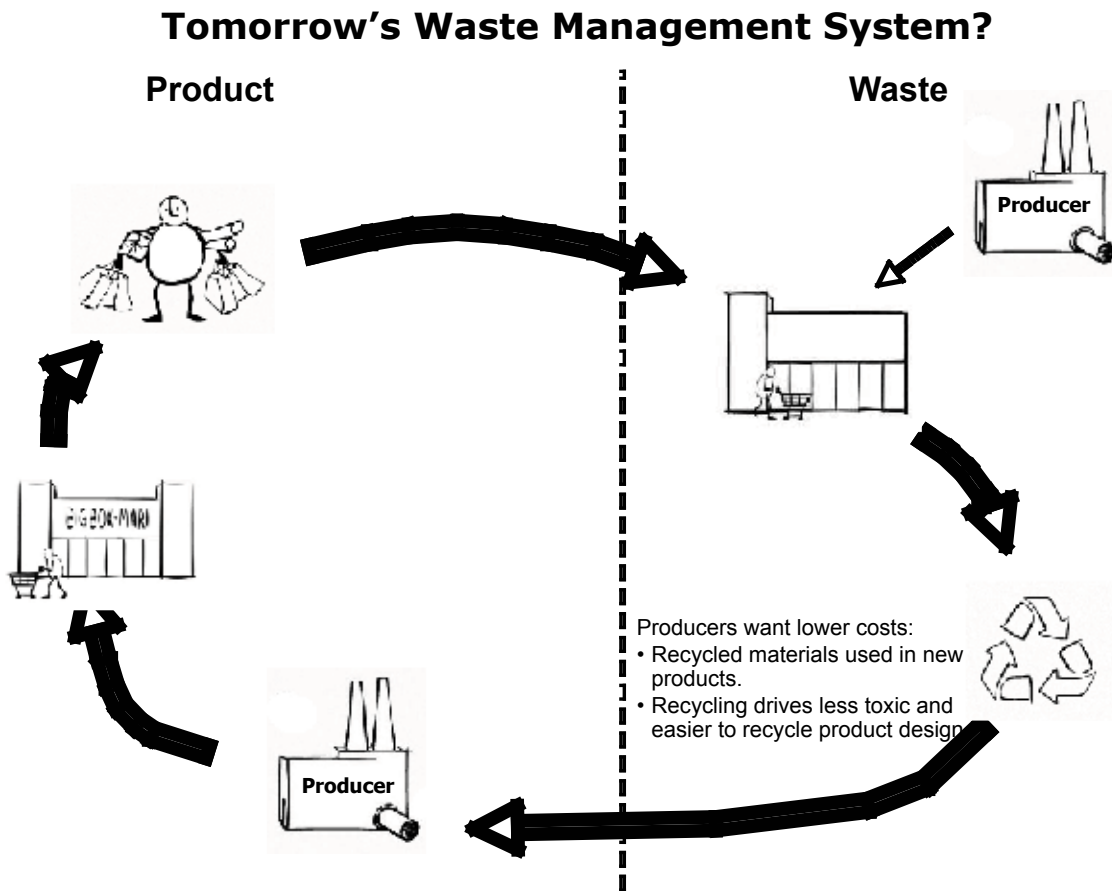


A cradle-to-cradle approach differs from conventional recycling, which often equates to 'downcycling,' a situation in which materials are processed or mixed with inferior or other materials that downgrade their purity or quality. This downcycling creates degraded materials that cannot be reused in the same types of products in which they were first used.<sup>9</sup> In a cradle-to-cradle approach, products equal 'nutrients'—either biological or technological. A biological nutrient is a material or product that is designed to return to the biological cycle, to be consumed by microorganisms in the soil or by other animals<sup>10</sup> (i.e., compostable). A technological nutrient is a material that is designed to go back into the technical (product manufacturing) cycle. The technical nutrients should be upcycled, to retain their high quality in a closed loop industrial/production cycle.

9 *Cradle-to-Cradle*, pp. 109-110.

10 *Cradle-to-Cradle*, p. 105.

Figure 8-4



### 8.2.2. Classifying Products

To operationalize the cradle-to-cradle approach, products would be classified into one of three categories. X-list products contain the most problematic substances, including constituents that are teratogenic, mutagenic, carcinogenic, or otherwise harmful to human and environmental health. Gray-list products contain problematic substances that are not in as urgent need of phase-out; these are substances essential for manufacturing and having no viable alternatives at the moment. P-list, or the “positive/preferred” list, products include substances that are actively identified as healthy and safe for use after considering their: oral or inhalation toxicity; chronic toxicity; sensitization effects; whether they have known or suspected carcinogenic, mutagenic, teratogenic, endocrine-disrupting, bioaccumulating, aquatic toxicity, biodegradability, ozone-depleting, or carbon emitting characteristics; or whether the substance’s byproducts have any of these characteristics.<sup>11</sup>

<sup>11</sup> *Cradle-to-Cradle*, pp. 173-175.

Implementation efforts would focus on moving away from products containing X-list constituents and beginning to consider and implement designs using materials from the P list.

### 8.2.3. Consumer Awareness and “Ecological Intelligence”

Daniel Goleman addresses the lack of information parity between a product’s manufacturers and its consumers in his book, *Ecological Intelligence*.<sup>12</sup> Goleman believes that full disclosure about a product’s ingredients, their safety, and the environmental impacts of the product’s manufacturing process, presented in an easy-to-understand form, will shift consumer behavior. He argues that this shift in consumer behavior will drive the manufacture of safer, less environmentally harmful products on a mass scale.<sup>13</sup>

### 8.2.4. Green Chemistry

Another effort to move away from hazardous materials in favor of safer substances is known as “green chemistry.” Also known as sustainable chemistry, green chemistry involves the design of chemical products and processes that reduce or eliminate the generation of hazardous substances and negative environmental impacts. It applies across the chemical’s life cycle, through the design, manufacture, and use of a product. Producing and using ‘green’ chemicals may result in fewer waste products, non-toxic components, and improved efficiency. Green chemistry applies innovative scientific solutions to real-world environmental situations.<sup>14</sup>

Exposure to harmful chemicals and pollution is a significant health and financial burden to modern societies. For example, diseases linked to environmental factors cost Washington State about \$2.7 billion a year in expenditures on health care and lost productivity.<sup>15</sup>

Finally, an approach with immediate application is the substitution of safer alternatives for hazardous products currently in use. This can be promoted by undertaking focused research on alternatives, providing information to consumers, and encouraging the use of more environmentally preferable procurement policies in institutions, government agencies and private firms.

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12 Daniel Goleman, *Ecological Intelligence*, (New York: Broadway Books, 2009). Cited hereafter as *Ecological Intelligence*.

13 *Ecological Intelligence*, p. 79.

14 *Twelve Principles of Green Chemistry, Twelve Principles of Green Chemistry | Green Chemistry | US EPA. 2009. Accessed Nov. 5 2009, [www.epa.gov/greenchemistry/pubs/principles.html](http://www.epa.gov/greenchemistry/pubs/principles.html) and see Paul Anastas and John Warner, *Green Chemistry: Theory and Practice* (New York: Oxford University Press, 1998).*

15 Kate Davies, “Economic Costs of Childhood Diseases and Disabilities Attributable to Environmental Contaminants in Washington State, USA.” *EcoHealth*, 3:86-94, 2006.

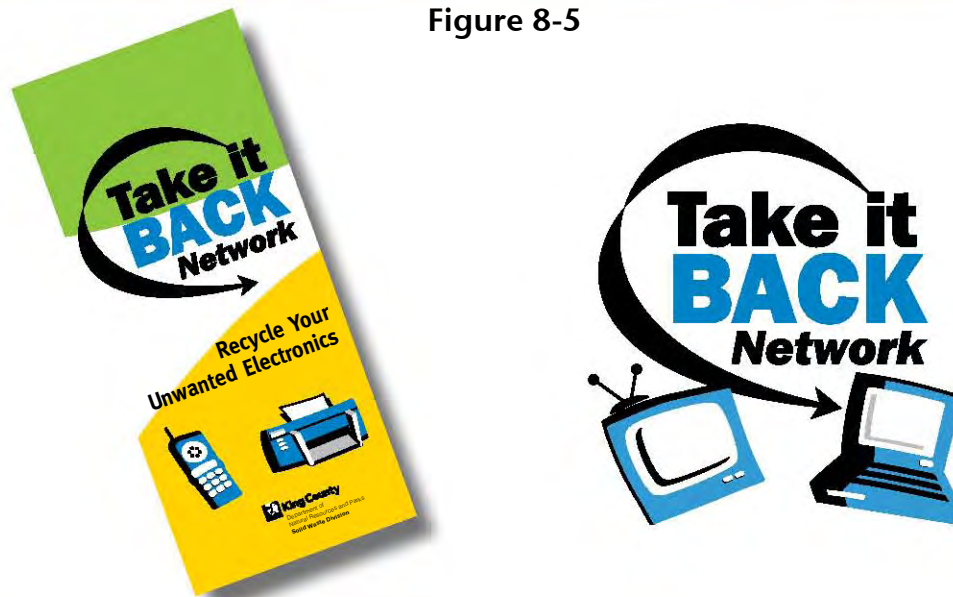
### 8.3. Producer Responsibility Initiatives in King County

As examples of local producer responsibility initiatives, the Program partners with businesses in several different areas. One area is pharmaceuticals, or unwanted medicines. The Program has lead a successful, two-year demonstration project for in-pharmacy take-back of unused medicines through the Medicine Return Program. This effort involved Bartell Drugs, a local pharmacy store chain, and Group Health, a regional HMO/health maintenance organization.



Secure medicine return at Bartell Drugs

Figure 8-5



The Program also supports Program Partners Seattle Public Utilities and King County Solid Waste Division in their sponsorship of the Take-It-Back Network. The Take-It-Back Network consists of groups of local retailers that accept various products that contain hazardous materials. Some of those products include hazardous obsolete electronics, and mercury-containing fluorescent lamps and tubes. While support of these pilot efforts will continue, the ultimate goal is enactment of legislation requiring manufacturers of these products to pay for their collection and disposal at end of their useful life.

Another example of efforts to influence the hazardous constituents of products is the Program's work with the chemical bisphenol-A (BPA). BPA is an estrogenic chemical and possible endocrine disruptor that is found in polycarbonate sports water bottles, baby bottles, liners for most food cans and a variety of other consumer products. The Program focuses on reducing the exposure of pregnant women, women of childbearing age and infants to BPA by providing information about BPA and its alternatives to audiences who should be concerned about using products that contain BPA. Consumer awareness and concern about this chemical have caused many manufacturers to stop using BPA in their manufacturing processes and products.

The Program's strong Integrated Pest Management program discourages use of the most hazardous pesticides and provides information about safer alternative products and practices. To address this lack of information about the constituents of common household products, the Program has published information about the contents of name brand products and rated them by their health and environmental impacts in a past publication, *Buy Smart, Buy Safe*. We currently produce a similar publication that addresses lawn-and-garden products, which is titled *Grow Smart, Grow Safe*. These publications help local consumers choose less hazardous, or non-hazardous, products. Another current publication that provides information about alternative products is Philip Dickey's *Safer Alternatives for the Home and Garden*.<sup>16</sup>

The Program also promotes green chemistry, advocates for sound chemicals policy, works to promote best management practices, and works to enact local ordinances and state statutes related to product formulation, green purchasing and information availability. On the national level, the Program is working to improve federal laws and regulations related to the Toxic Substances Control Act, child safety, product formulation and information availability. It encourages the development of an academically based, sustainable design center to provide research services on reducing toxics to businesses and policy makers. Lastly, the Program is participating in a regional Children's Environmental Health Coalition that aims to reduce the exposure of young children and youth to hazardous chemicals through information dissemination.

The Program actively advocates for changes in local, state and federal laws and regulations, especially legislation that relates to the following: product stewardship; green chemicals policies; the development of safer alternatives; and the phase-out of specific chemicals such as lead, mercury, bisphenol-A, brominated flame retardants, and persistent bioaccumulative toxins (PBTs).

The Program takes a leadership role in regional and national coalitions and partnerships, including the Northwest Product Stewardship Council, the Product Stewardship Institute, and the National Pollution Prevention Roundtable.

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<sup>16</sup> Philip Dickey, *Safer Alternatives for the Home and Garden* (Seattle: Washington Toxics Coalition, 2006).

Figure 8-6



## Northwest Product Stewardship Council



### 8.4. Future Directions

In the future, the Program will continue its involvement in a variety of producer responsibility efforts and will encourage product reformulations, when these are necessary and possible. The Program will continue to support the development of safer alternatives, to provide information to consumers about those alternatives, and to promote efforts towards green chemistry.

These initiatives will be supported by continued efforts to obtain regulatory restrictions or bans on certain products and to pass legislation that restructures the system at the 'upstream' end of a product's life—that is, during its early development. Partnerships with regional and national organizations will continue, as these provide knowledge and expertise from other parts of the country and the world, and allow the Program to share its successes with others.

The Program may explore product differentiation strategies more fully. This approach might involve discouraging the use of specific products by making them harder or more expensive to obtain, use and/or dispose of. For example, special licensing could be required to obtain and use certain pesticides or herbicides, and surcharges could be levied on the sale of certain chemicals. Other possibilities include raising disposal fees and increasing liability for products that are highly toxic.

Ultimately, it is in society's long-term interest to ensure that products in the marketplace are safe, handled responsibly at the end of life, and reused or recycled to the extent possible. Less waste—particularly less hazardous waste—is the goal of local efforts. Because the Program ultimately seeks to reduce or eliminate human and environmental exposure to toxic chemicals and hazardous materials, it promotes full disclosure about the chemicals present in products and industrial processes. Today's marketplace can be transformed only if consumers have ready access to information, product ratings and recommendations from trusted sources.