

## Evolution of the Ontario Blue Box Program: Transitioning from Government to Producer Responsibility

Revised July 15, 2010

The curbside recycling program in the Canadian province of Ontario is increasingly cited by producers of branded beverages in the United States and by some government officials as a model for extended producer responsibility (EPR) for packaging. A key feature of the Ontario Blue Box program is its broad “multimaterial” scope – collecting printed paper as well as numerous consumer packaging types, including paper, glass, metal, plastic and composite containers. The Ontario program is run by municipal governments (physical responsibility) and, since 2004, has shared financial responsibility between producers and local governments for collection costs. In this paper we survey the evolution of Ontario programs for recycling discarded product packaging; evaluate performance and cost data from the Ontario curbside program; and provide the Ontario government’s rationale for moving towards full EPR for packaging. We conclude by asking a very basic question: Should managing manufactured products and associated packaging be a core function of government?

**Evolution of Ontario’s Blue Box and deposit programs.** The feature of the Ontario curbside program of key interest to the beverage industry and to local governments (for different reasons) is partial industry funding of government-managed programs. However, Ontario’s programs are not static, as milestones in the evolution of Ontario’s programs in **Table 1** make clear. Key facts from this historical perspective include:

1. The Ontario Blue Box program was originally [proposed by the beverage industry](#) in the 1980s as an alternative to a provincial mandate that a portion of soft drinks be sold in refillable bottles,<sup>1</sup> as most [beer in Ontario](#) has been since the 1940s;<sup>2</sup>
2. Beer and liquor & wine containers are recovered in deposit-refund programs in Ontario which achieve far high recovery rates (94% and 79%, respectively, representing containers from all sources, residential as well as industrial, commercial and institutional);
3. Wine and liquor containers were pulled out of the Blue Box in 2007 due to concerns about the impact of broken glass on the quality of other materials, particularly paper, and the poor recovery rates away from homes;
4. The Ontario Environment Ministry has proposed, in a review of the provincial enabling legislation, to move the Blue Box program from 50% to 100% industry financial responsibility. Provincial and local governments in Ontario realize that when industry is paying full costs they will demand control over program management, which will in turn lead to industry contracting with service providers of their choice – that is, not necessarily with local government.

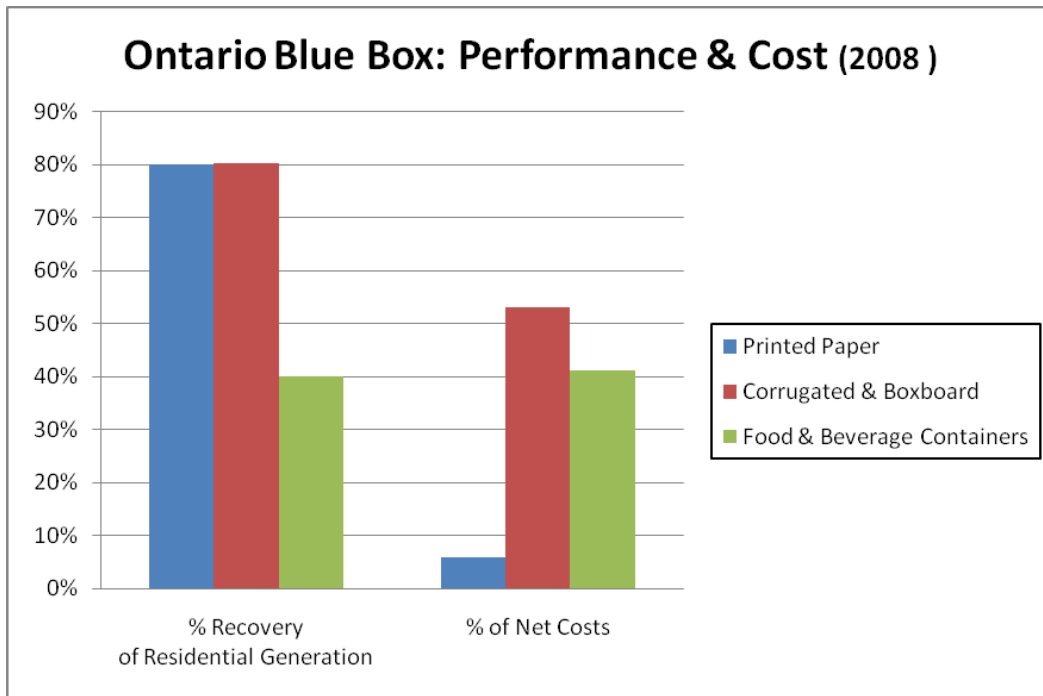
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<sup>1</sup> David Menzies, 1997, “Waste Blues; Curbside Recycling Reassessed,” *The Financial Post* (September 1, 1997). Available at <http://www.web.net/~jjackson/wstblues.html>

<sup>2</sup> The recovery rate of all beer containers sold was 94% in 2008-09. Seventy percent of beer is sold in refillable glass bottles, with a recover rate of 99%. (SOURCE: [The Beer Store, 2008 report](#), p.16]

**Performance and Costs.** The Ontario Blue Box program is one of the oldest curbside recycling programs in North America, as well as the most comprehensive. Since industry has paid half of the program costs since 2004, performance and cost data are closely tracked by obligated parties. Hence, the Ontario Blue Box program is ideal for examining the strengths and weaknesses of an advanced municipal curbside recycling program as a model for EPR for packaging.

Stewardship Ontario was established in 2004 as the industry funding organization to collect fees from producers and allocate the required reimbursement to municipalities. Stewardship Ontario gathers detailed province-wide collection and cost data in order to assess producer fees.<sup>3</sup> Blue Box materials are divided into categories and sub-categories. For each category and sub-category, Stewardship Ontario provides data on quantity generated, percentage of generated, quantity recovered, recovery rate (quantity recovered divided by quantity generated), total net costs, and net costs per tonne. We analyzed Stewardship Ontario data used to assess 2010 fees (based on 2008 data). We separated “Packaging” into two sub-categories: Paper-based packaging -- *Corrugated (OCC) & Boxboard* -- and *Food and Beverage Containers*. We then moved the relatively small (by weight) category of composite containers (gabletop cartons, paper laminants and aseptic) from “Paper-based Packaging” to *Food and Beverage Containers*, along with plastic, steel, aluminum, and glass beverage and food packaging. This was done to make more meaningful comparisons.



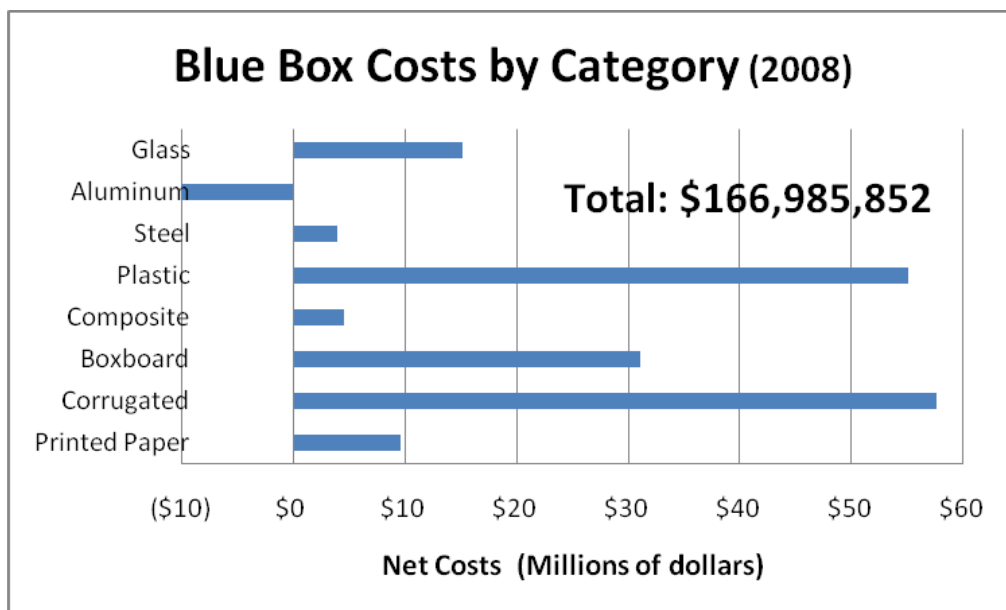
**FIGURE 1.** Relative performance and % of net costs of Blue Box categories.  
[SOURCE: [Stewardship Ontario](#)]

<sup>3</sup> Data in this section are from Stewardship Ontario, **Detailed Calculation Tables for Preliminary 2010 Blue Box Stewards’ Fees**, Table 1, Generation and Recovery (Sheet 1, Gen and Rec) and Table 2, Gross and Net Costs (Sheet 2: Gross and Net Costs), available at <http://www.productpolicy.org/ppi/2010-Stewardship-Ontario-Blue-Box-Tables-1and2.xls>

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The relative performance and net cost of the three major Blue Box categories are presented graphically in **Figure 1**. Further detail is provided in **Table 2**. Key results include the following:

1. *Printed Paper* is recovered at a high rate (80%) and low cost (\$20 per tonne) and accounts for only 6% of program net costs. *Printed Paper* constitutes more than half (52%) of all material by weight collected in the Blue Box program.
2. *Corrugated & Boxboard* are recovered at a high rate (80%) and at a high cost (\$368 per tonne). This category accounts for 53% of net program costs.
3. *Food & Beverage Containers* are recovered at a low rate (40%) – half that of paper packaging – and at a high cost (\$341 per tonne). The category accounts for 41% of net program costs.



**FIGURE 2.** Total net costs of Blue Box materials. [SOURCE: [Stewardship Ontario](#)]

The total net cost of managing all packaging (*Corrugated, Boxboard* and *Food & Beverage Containers*) was more than \$157 million, or 94% of the total cost of almost \$167 million. The only material in the Blue Box program that is a revenue *source* is aluminum, and it accounts for only \$10 million out of the total \$167 million, or less than 6% of program costs (**Figure 2**). The largest portion (34.5%) of net program costs is corrugated cardboard, but it is recovered at a rate of 92% of generation (**Table 3**). Close behind is plastic packaging (33%) but its recovery rate is only 23% of generation. Aluminum yields net \$937 per tonne, whereas the net cost for other materials ranges as high as \$2,604 for polystyrene, \$2,380 for plastic laminants, and \$2,318 for plastic film. Printed paper, on the other hand, incurs a much lower per metric-tonne net cost (average \$20, range \$10 to \$77 per metric tonne).

Policy planners should be aware of false comparisons sometimes made between the cost of beverage deposit-return systems compared with curbside systems. This was recently done by

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consultants hired by the beverage industry in Vermont <sup>4</sup> to “prove” that curbside recycling is cheaper than the deposit-refund system. They compared a cost estimate for the deposit-refund system (inflated by monetizing “consumer transport) with the *average* curbside cost. But as we have seen, the cost of recycling beverage containers in curbside systems is high relative to printed paper, which is the dominant material by weight. In Ontario, the average net costs for all materials in the Blue Box is \$180 per tonne. But that figure is heavily weighted by the preponderance of cheap-to-recycle printed paper, at \$20 per tonne. Removing beverage and food containers, at an average net cost of \$342 per tonne, would significantly reduce the overall cost of managing the remaining items while recovering 80% of those items.

**Ontario’s transition to full EPR.** Ontario is in the process of [reviewing the Waste Diversion Act](#). Currently, industry pays 50% of net recycling costs. Environment Minister John Gerretsen has proposed moving to 100% industry funding, with legislation expected in 2010.<sup>5</sup> Provincial and local governments understand that at some point some obligated industries paying 100% of costs may elect to contract with alternative service providers and choose to no longer do business with local government. The local government discussion is turning to “[fair compensation](#)” for “stranded” public infrastructure assets.<sup>6</sup>

The promise of producer funding of existing recycling programs is enticing; however, Ontario seems to be moving in a direction of acknowledging that a program that imposes financial responsibility on producers *without physical responsibility* can fall short of meeting the promise of EPR.

In its review of the Blue Box system the Ontario government emphasizes that “EPR is premised on making those who put products and packaging into the marketplace responsible for managing the waste associated with them. EPR shifts the responsibility for waste diversion to those that are best able to influence and control decisions throughout the lifecycle of a product or package.”<sup>7</sup> Municipalities “have little influence over the products and packaging introduced into the Ontario marketplace, yet must manage those products and packages through their waste management systems.”

Ontario appears to be moving away from the earlier framework that *prescribed a central role for municipalities* in physical responsibility for recycling, to a framework that would allow producers flexibility to innovate new approaches that would allow for “the most efficient discharging of obligations for the responsible parties.”<sup>8</sup>

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<sup>4</sup> Report by [DSM Environmental Services, Inc.](#), March 26, 2010.

<sup>5</sup> From [Waste to Worth: the Role of Waste Diversion in the Green Economy](#), Minister’s Report on the Review of Ontario’s Waste Diversion Act 2002, September, 2009.

<sup>6</sup> [AMO, RPWCO and MWA joint response to the Waste Diversion Act Review Paper: Towards Zero Waste](#). February 1, 2010.

<sup>7</sup> [Waste to Worth](#), cited above, p.i.

<sup>8</sup> [Waste to Worth](#), cited above, p.16.

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The Ontario government is stating the intent to move towards “outcomes-based” legislation, making *individual* producers fully responsible for meeting waste diversion requirements, as well as for waste disposal in the residential, industrial, commercial and institutional sectors. “This approach,” the government emphasizes, “would re-orient the focus of the Waste Diversion Act from instructing producers on how to fulfill their requirements to making individual producers responsible for meeting outcomes and letting them decide how to do so.”

The new policy direction by the Ontario government suggests that Ontario is moving in the direction of clearer separation of responsibility between producers who finance and design the system and government which sets the policy framework, “including designating materials, setting targets and establishing timelines, penalties for non-compliance and scientific and environmental standards where appropriate.”<sup>9</sup>

The Ontario government is also proposing significant changes to the oversight of EPR programs. In its review of the existing program, the government notes that the Waste Diversion Organization Board of Directors is made up of representatives of entities (industry and municipal) with vested stakes in the program and that “this structure imbeds potential conflicts, real or perceived, as Board members deliberate and vote on matters that directly affect the interests of their electors.” To correct this conflict, the government is proposing to shift the structure of the WDO to “appointments based on skills and competencies,” which, it says, would “go a long way to eliminating the current issues related to potential conflicts of interest.”<sup>10</sup>

**Appropriate role of government.** When asking what level of industry responsibility is efficient it is important to ask a fundamental question: *Is it an appropriate purpose of government to act as a service provider for functions that producers can provide through an extended supply chain?* In other words, should the public sector or its designees provide management of end-of-life products and associated packaging, rather than producers, their contractors and consumers? Product Policy Institute believes the purpose of government is to protect public health and the environment and to provide public amenities, such as education and aesthetic amenities, that the market cannot or will not provide to all. Government’s engagement in waste management has had unintended consequences in the past, and part of the purpose of EPR is to shift waste management functions as well as costs to the supply chain, with the producer at the top of a chain of custody.

PPI released a [report](#) in 2005<sup>11</sup> that analyzed the history of waste management over the last century. The most striking pattern is the rapid rise of throwaway products and associated packaging in the consumer waste stream, especially since the 1950s. At the turn of the 19<sup>th</sup> century, when local governments first took on responsibility for waste collection and disposal, products and packaging constituted only 7% of the discards managed by municipalities – and

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<sup>9</sup> [Waste to Worth](#), cited above, p.25.

<sup>10</sup> [Waste to Worth](#), cited above, p.25.

<sup>11</sup> Helen Spiegelman & Bill Sheehan, 2005. [Unintended Consequences: Municipal Solid Waste Management and the Throwaway Society](#). Product Policy Institute.

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they were mostly simple manufactured products like paper and glass. Today, *three-quarters* of what local governments are responsible for managing (either directly or via franchised haulers) is products and packaging, with a large portion consisting of disposable or hazardous goods. PPI argued that providing these services to the makers and marketers of manufactured goods, without feedback, encouraged the “throw-away society.” While waste management was originally a matter of sanitation and public health, it is now more a matter of providing consumer convenience.

PPI’s preferred approach is extending producer responsibility, both financial and physical. Nor only will the full cost of managing products and packaging responsibly be reflected in product prices, but “cradle-to-cradle” responsibility will give rise to an extended supply chain, with producers ensuring a reverse-logistics system for products and associated packaging when consumers are done with them. The initial focus of EPR has naturally been directed to household hazardous products. Toxic-containing products with very low recovery rates have been the subject of early U.S. producer responsibility legislation: electronic products; mercury-containing lights, batteries, thermostats and switches; paint; and pharmaceuticals, for example. Now attention is starting to focus on “non-hazardous” disposable products and packaging in the consumer waste stream. More than half of “municipal” solid waste is packaging or “non-durable goods” (defined by US EPA as lasting less than three years). Packaging alone constitutes over 30% of the entire consumer waste stream.

**TABLE 1. Evolution of Ontario Blue Box and Deposit Programs**

| YEAR                    | ITEM  | RESPONSIBILITY   |  | CHANGE / RESULTS  |
|-------------------------|---|--|--|---|
|                         |   | FINANCIAL  | PHYSICAL   |   |
| <b>1940s to present</b> | Beer<br>(70% refillable glass, 2008)  | <b>100% PRODUCER</b><br>(Deposit-return)                               | <b>100% PRODUCER</b><br>(Deposit-return)   | Recovery rate: <b>94%</b> of all containers sold [SOURCE: The Beer Store, 2008 data]  |
| <b>1980s</b>            | Soft drinks<br>Wine/Liquor<br>Other Containers<br>OCC & Boxboard<br>Printed Paper | <b>GOVERNMENT</b><br>+ minor initial producer funding (voluntary) (1)  | <b>100% GOVERNMENT</b>   | " <b>Blue Box</b> " curbside program proposed by soft drink industry as alternative to refillables.   |
| <b>1994</b>             | Soft drinks<br>Wine/Liquor<br>Other Containers<br>OCC & Boxboard<br>Printed Paper | <b>GOVERNMENT</b><br>+ decreasing producer funding (voluntary)(1)      | <b>100% GOVERNMENT</b>   | Provincial legislation (in 1992) mandated all municipalities > 5,000 population to operate a "Blue Box" program.  |
| <b>2004</b>             | Soft drinks<br>Wine/Liquor<br>Other Containers<br>OCC & Boxboard<br>Printed Paper | <b>50% GOVERNMENT</b><br><b>50% PRODUCER</b><br>(mandatory)            | <b>100% GOVERNMENT</b>   | Provincial legislation ( <i>Waste Diversion Act</i> ) required producers to pay 50% of net "Blue Box" program costs.  |
| <b>2007 to present</b>  | Wine/Liquor (glass)   | <b>100% PRODUCER</b><br>(Deposits charged at provincial liquor stores) | <b>100% PRODUCER</b><br>(Containers returned for refund at Beer Stores)                                  | Deposits introduced on glass containers sold by Liquor Control Board. Recovery rate 2009: <b>79%</b> of all containers sold. [SOURCE: CM Consulting]                            |
| <b>2009</b>             | Soft drinks<br>Other containers<br>OCC & Boxboard<br>Printed paper                | <b>50% PRODUCER</b><br><b>50% GOVERNMENT</b>                           | <b>100% GOVERNMENT</b>   | Containers other than wine & liquor recycled in "Blue Box" only. Recovery rate: <b>40.1%</b> of containers generated by residential sources only. [SOURCE: Stewardship Ontario] |
| <b>2010</b>             | Soft drinks<br>Other containers<br>OCC & Boxboard<br>Printed paper                | <b>100% PRODUCER</b>   | <b>GOVERNMENT -&gt; PRODUCER ?</b><br>Local governments seeking "fair compensation for stranded assets." | Review of <i>Waste Diversion Act</i> : full producer financial responsibility proposed for Blue Box items.  |

(1) Between 1985 and 1996, industry (the lion's share coming from the soft drink companies) paid \$41 million into the Ontario Blue Box system. Municipal and provincial taxpayers, on the other hand, contributed ... \$2.33 billion (including landfill costs of \$1.75 billion) SOURCE: David Menzies, "Waste Blues," *Financial Times*, September 1997.

<http://www.web.net/~jjackson/wstblues.html>

**Ontario Blue Box Performance and Costs 2010**  
(Data from Stewardship Ontario, used to calculate Producer fees)

**TABLE 2: Stewardship Ontario, Summary (2010)**

| Col> | A               | B                           | C                           | D                                 | E                             | F                    | G                  | H              | I                   | J |
|------|-----------------|-----------------------------|-----------------------------|-----------------------------------|-------------------------------|----------------------|--------------------|----------------|---------------------|---|
| ROW  | Item            | Quantity Generated (tonnes) | Quantity Recovered (tonnes) | Percent of Total Tonnes Recovered | % Recovery (Residential only) | Total Net Cost       | Net Cost per tonne | % of Net Costs | Local Gov't Cost    |   |
| 1    | Printed Paper   | 608,898                     | 487,590                     | 52.5%                             | 80.1%                         | \$9,653,777          | \$19.80            | 5.8%           | \$4,826,889         |   |
| 2    | OCC & Boxboard  | 299,708                     | 240,655                     | 25.9%                             | 80.3%                         | \$88,634,731         | \$368.31           | 53.1%          | \$44,317,366        |   |
| 3    | Other Packaging | 501,561                     | 201,282                     | 21.7%                             | 40.1%                         | \$68,697,344         | \$341.30           | 41.1%          | \$34,348,672        |   |
| 4    | <b>TOTAL</b>    | <b>1,410,167</b>            | <b>929,527</b>              | <b>100.0%</b>                     |                               | <b>\$166,985,852</b> |                    | <b>100.0%</b>  | <b>\$83,492,926</b> |   |
| 5    | <b>AVERAGE</b>  |                             |                             |                                   | <b>65.9%</b>                  |                      | <b>\$179.65</b>    |                |                     |   |

**TABLE 3: Stewardship Ontario, Detail (2010)**

| Col> | A                         | B                           | C                           | D                                 | E                             | F                    | G                  | H              | I                   | J |
|------|---------------------------|-----------------------------|-----------------------------|-----------------------------------|-------------------------------|----------------------|--------------------|----------------|---------------------|---|
| ROW  | Item                      | Quantity Generated (tonnes) | Quantity Recovered (tonnes) | Percent of Total Tonnes Recovered | Recovery % (Residential only) | Total Net Cost       | Net Cost per tonne | % of Net Costs | Local Gov't Cost    |   |
| 6    | <b>Printed Paper</b>      |                             |                             |                                   |                               |                      |                    |                |                     |   |
| 7    | Printed Paper             | 608,898                     | 487,590                     | 52.5%                             | 80.1%                         | \$9,653,777          | \$19.80            | 5.8%           | \$4,826,889         |   |
| 8    | <b>OCC &amp; Boxboard</b> |                             |                             |                                   |                               |                      |                    |                |                     |   |
| 9    | Corrugated                | 169,170                     | 155,563                     | 16.7%                             | 92.0%                         | \$57,610,643         | \$370.34           | 34.5%          | \$28,805,322        |   |
| 10   | Boxboard                  | 130,538                     | 85,092                      | 9.2%                              | 65.2%                         | \$31,024,088         | \$364.59           | 18.6%          | \$15,512,044        |   |
| 11   | <b>Other Packaging</b>    |                             |                             |                                   |                               |                      |                    |                |                     |   |
| 12   | Composite (1)             | 58,726                      | 4,752                       | 0.5%                              | 12.4%                         | \$4,547,882          | \$957.05           | 2.6%           | \$2,273,941         |   |
| 13   | Plastic                   | 244,619                     | 56,718                      | 6.1%                              | 23.2%                         | \$55,040,731         | \$970.43           | 33.0%          | \$27,520,366        |   |
| 14   | Steel                     | 61,027                      | 34,137                      | 3.7%                              | 55.9%                         | \$3,939,770          | \$115.41           | 2.4%           | \$1,969,885         |   |
| 15   | Aluminum                  | 27,204                      | 10,693                      | 1.2%                              | 39.3%                         | (\$10,025,721)       | (\$937.61)         | -6.0%          | (\$5,012,861)       |   |
| 16   | Glass                     | 109,985                     | 94,982                      | 10.2%                             | 86.4%                         | \$15,194,682         | \$159.97           | 9.1%           | \$7,597,341         |   |
| 17   | <b>TOTAL</b>              | <b>1,410,167</b>            | <b>929,527</b>              | <b>100.0%</b>                     |                               | <b>\$166,985,852</b> |                    | <b>100.0%</b>  | <b>\$83,492,926</b> |   |
| 18   | <b>AVERAGE</b>            |                             |                             |                                   | <b>65.9%</b>                  |                      | <b>\$179.65</b>    |                |                     |   |

(1) Composite containers = Gabletop, Paper laminants & Asceptic

**SOURCE:** 2010 Rules & Detailed Fee Calculation Tables: *Detailed Calculation Tables for Preliminary 2010 Blue Box Stewards' Fees.*

[http://www.stewardshipontario.ca/bluebox/fees/fees\\_2010.htm](http://www.stewardshipontario.ca/bluebox/fees/fees_2010.htm)

**Table 1: Generation and Recovery (full-year obligation)**

| Category                     | Material                     | 2008                        |                   |                             |               |                               |                     |
|------------------------------|------------------------------|-----------------------------|-------------------|-----------------------------|---------------|-------------------------------|---------------------|
|                              |                              | Quantity Generated (tonnes) | %age of Generated | Quantity Recovered (tonnes) | Recovery Rate | Quantity to Disposal (tonnes) | % of Total Disposed |
| <b>PRINTED PAPER</b>         |                              |                             |                   |                             |               |                               |                     |
|                              | Newsprint - CNA/OCNA         | 255,785                     | 18.1%             | 224,344                     | 87.7%         | 31,440                        | 6.5%                |
|                              | Newsprint - Non-CNA/OCNA     | 125,176                     | 8.9%              | 109,790                     | 87.7%         | 15,386                        | 3.2%                |
|                              | Magazines and Catalogues     | 91,339                      | 6.5%              | 80,112                      | 87.7%         | 11,227                        | 2.3%                |
|                              | Telephone Books              | 15,392                      | 1.1%              | 13,500                      | 87.7%         | 1,892                         | 0.4%                |
|                              | Other Printed Paper          | 121,206                     | 8.6%              | 59,844                      | 49.4%         | 61,362                        | 12.8%               |
|                              | <b>Printed Paper Total</b>   | <b>608,898</b>              | <b>43.2%</b>      | <b>487,590</b>              | <b>80.1%</b>  | <b>121,307</b>                | <b>25.24%</b>       |
| <b>PACKAGING</b>             |                              |                             |                   |                             |               |                               |                     |
| <b>Paper Based Packaging</b> |                              |                             |                   |                             |               |                               |                     |
|                              | Old Corrugated Containers    | 169,170                     | 12.0%             | 155,563                     | 92.0%         | 13,607                        | 2.8%                |
|                              | Gabletop                     | 15,184                      | 1.1%              | 3,576                       | 23.5%         | 11,608                        | 2.4%                |
|                              | Paper Laminants              | 39,289                      | 2.8%              | 393                         | 1.0%          | 38,897                        | 8.1%                |
|                              | Aseptic Containers           | 4,252                       | 0.3%              | 784                         | 18.4%         | 3,468                         | 0.7%                |
|                              | Old Boxboard                 | 130,538                     | 9.3%              | 85,092                      | 65.2%         | 45,446                        | 9.5%                |
|                              | <b>Paper Packaging Total</b> | <b>358,435</b>              | <b>25.4%</b>      | <b>245,408</b>              | <b>68.5%</b>  | <b>113,027</b>                | <b>23.52%</b>       |
| <b>Plastic Packaging</b>     |                              |                             |                   |                             |               |                               |                     |
|                              | PET bottles                  | 49,503                      | 3.5%              | 28,240                      | 57.0%         | 21,263                        | 4.4%                |
|                              | HDPE bottles                 | 27,372                      | 1.9%              | 15,717                      | 57.4%         | 11,656                        | 2.4%                |
|                              | Plastic Film                 | 60,605                      | 4.3%              | 4,220                       | 7.0%          | 56,384                        | 11.7%               |
|                              | Plastic Laminants            | 30,062                      | 2.1%              | 301                         | 1.0%          | 29,762                        | 6.2%                |
|                              | Polystyrene                  | 22,465                      | 1.6%              | 777                         | 3.5%          | 21,689                        | 4.5%                |
|                              | Other Plastics               | 54,611                      | 3.9%              | 7,464                       | 13.7%         | 47,147                        | 9.8%                |
|                              | <b>Plastics Total</b>        | <b>244,619</b>              | <b>17.3%</b>      | <b>56,718</b>               | <b>23.2%</b>  | <b>187,901</b>                | <b>39.09%</b>       |
| <b>Steel Packaging</b>       |                              |                             |                   |                             |               |                               |                     |
|                              | Food & Beverage Cans         | 50,800                      | 3.6%              | 31,317                      | 61.6%         | 19,483                        | 4.1%                |
|                              | Aerosols                     | 4,439                       | 0.3%              | 1,168                       | 26.3%         | 3,270                         | 0.7%                |
|                              | Paint Cans                   | 5,788                       | 0.4%              | 1,652                       | 28.5%         | 4,136                         | 0.9%                |
|                              | <b>Steel Total</b>           | <b>61,027</b>               | <b>4.3%</b>       | <b>34,137</b>               | <b>55.9%</b>  | <b>26,889</b>                 | <b>5.59%</b>        |
| <b>Aluminum Packaging</b>    |                              |                             |                   |                             |               |                               |                     |
|                              | Al Food & Beverage Cans      | 23,216                      | 1.6%              | 9,586                       | 41.3%         | 13,630                        | 2.8%                |
|                              | Other Aluminum Packaging     | 3,989                       | 0.3%              | 1,107                       | 27.8%         | 2,881                         | 0.6%                |
|                              | <b>Aluminum Total</b>        | <b>27,204</b>               | <b>1.9%</b>       | <b>10,693</b>               | <b>39.3%</b>  | <b>16,512</b>                 | <b>3.44%</b>        |
| <b>Glass</b>                 |                              |                             |                   |                             |               |                               |                     |
|                              | Food and Beverage - Flint    | 85,914                      | 6.1%              | 76,687                      | 89.3%         | 9,227                         | 1.9%                |
|                              | Food and Beverage - Coloured | 24,071                      | 1.7%              | 18,295                      | 76.0%         | 5,776                         | 1.2%                |
|                              | <b>Glass Total</b>           | <b>109,985</b>              | <b>7.8%</b>       | <b>94,982</b>               | <b>86.4%</b>  | <b>15,002</b>                 | <b>3.12%</b>        |
|                              | <b>PACKAGING TOTAL</b>       | <b>801,269</b>              | <b>56.8%</b>      | <b>441,938</b>              | <b>55.2%</b>  | <b>359,331</b>                | <b>74.76%</b>       |
|                              | <b>TOTALS</b>                | <b>1,410,167</b>            | <b>100.0%</b>     | <b>929,529</b>              | <b>65.9%</b>  | <b>480,638</b>                | <b>100.00%</b>      |

| Basis for Distribution for Common Costs |                   |                        |               |
|---|-------------------|------------------------|---------------|
| Density                                 | Volume            | Percentage of Stewards |               |
| kg/m3                                   | m3                |                        |               |
| 250                                     | 1,023,139         | 6.7%                   | 6.7%          |
| 250                                     | 500,704           | 3.3%                   | 3.3%          |
| 275                                     | 332,143           | 2.3%                   | 2.3%          |
| 275                                     | 55,970            | 0.4%                   | 0.4%          |
| 135                                     | 897,820           | 4.7%                   | 4.7%          |
|   | <b>2,809,776</b>  | <b>17.3%</b>           |               |
| 55                                      | 3,075,826         | 11.5%                  | 11.5%         |
| 35                                      | 433,834           | 1.4%                   | 1.4%          |
| 35                                      | 1,122,557         | 3.6%                   | 3.6%          |
| 35                                      | 121,491           | 0.4%                   | 0.4%          |
| 60                                      | 2,175,641         | 8.5%                   | 8.5%          |
|   | <b>6,929,349</b>  | <b>25.4%</b>           |               |
| 25                                      | 1,980,123         | 8.2%                   | 8.2%          |
| 25                                      | 1,094,898         | 4.5%                   | 4.5%          |
| 28                                      | 2,164,452         | 9.4%                   | 9.4%          |
| 28                                      | 1,073,656         | 4.6%                   | 4.6%          |
| 15                                      | 1,497,680         | 5.2%                   | 5.2%          |
| 25                                      | 2,184,433         | 9.0%                   | 9.0%          |
|   | <b>9,995,242</b>  | <b>40.9%</b>           |               |
| 90                                      | 564,447           | 4.9%                   | 4.9%          |
| 90                                      | 49,319            | 0.4%                   | 0.4%          |
| 90                                      | 64,307            | 0.6%                   | 0.6%          |
|   | <b>678,073</b>    | <b>5.9%</b>            |               |
| 30                                      | 773,864           | 4.4%                   | 4.4%          |
| 30                                      | 132,951           | 0.8%                   | 0.8%          |
|   | <b>906,815</b>    | <b>5.1%</b>            |               |
| 300                                     | 286,379           | 4.2%                   | 4.2%          |
| 300                                     | 80,237            | 1.2%                   | 1.2%          |
|   | <b>366,616</b>    | <b>5.4%</b>            |               |
|   | <b>18,876,093</b> |                        | <b>100.0%</b> |

**Allocation of Stewards Within Material Categories**

Weight                    40%  
 Volume                    60%

**Table 2: Gross and Net Costs (full-year obligation)**

| Category                   | Material                     | Quantity Recovered | Gross Cost         |                       | Revenues           |                       | Net Cost of Current System |                        |                |                      |                   | Net Cost to Achieve 60% Diversion Rate |                            |                      |                   |
|----------------------------|------------------------------|--------------------|--------------------|-----------------------|--------------------|-----------------------|----------------------------|------------------------|----------------|----------------------|-------------------|--|----------------------------|----------------------|-------------------|
|                            |                              |                    | Per-tonne          | Total Cost            | Per-tonne          | Total Revenue         | Per-tonne                  | Total Net Cost         | %age of Net \$ | %age of Printed Cost | %age of Pckg Cost | Assumed Recovery Rate 60%              |                            |                      |                   |
|                            |                              |                    |                    |                       |                    |                       |                            |                        |                |                      |                   | Cost to Manage Rest of 60%             | %age Cost of Tonnes to 60% | %age of Printed Cost | %age of Pckg Cost |
| <b>PRINTED PAPER</b>       |                              |                    |                    |                       |                    |                       |                            |                        |                |                      |                   |  |                            |                      |                   |
| Printed Paper              | Newsprint - CNA/OCNA         | 224,344            | \$ 116.01          | \$ 26,025,430         | \$ 106.01          | \$ 23,782,917         | \$ 10.00                   | \$ 2,242,513           | 1.3%           | 23.2%                |                   | \$ -                                   | 0.0%                       | 0.0%                 |                   |
|                            | Newsprint - Non-CNA/OCNA     | 109,790            | \$ 116.01          | \$ 12,736,331         | \$ 106.01          | \$ 11,638,890         | \$ 10.00                   | \$ 1,097,441           | 0.7%           | 11.4%                |                   | \$ -                                   | 0.0%                       | 0.0%                 |                   |
|                            | Magazines and Catalogues     | 80,112             | \$ 116.01          | \$ 9,293,549          | \$ 106.01          | \$ 8,492,759          | \$ 10.00                   | \$ 800,790             | 0.5%           | 8.3%                 |                   | \$ -                                   | 0.0%                       | 0.0%                 |                   |
|                            | Telephone Books              | 13,500             | \$ 174.65          | \$ 2,357,726          | \$ 106.01          | \$ 1,431,116          | \$ 68.64                   | \$ 926,610             | 0.6%           | 9.6%                 |                   | \$ -                                   | 0.0%                       | 0.0%                 |                   |
|                            | Other Printed Paper          | 59,844             | \$ 179.31          | \$ 10,730,761         | \$ 102.67          | \$ 6,144,338          | \$ 76.64                   | \$ 4,586,424           | 2.7%           | 47.5%                |                   | \$ 987,058                             | 0.5%                       | 100.0%               |                   |
| <b>Printed Paper Total</b> |                              | <b>487,590</b>     | <b>\$ 125.40</b>   | <b>\$ 61,143,797</b>  | <b>\$ 105.60</b>   | <b>\$ 51,490,021</b>  | <b>\$ 19.80</b>            | <b>\$ 9,653,777</b>    | <b>5.8%</b>    | <b>100.0%</b>        |                   | <b>\$ 987,058</b>                      | <b>0.5%</b>                | <b>100.0%</b>        |                   |
| <b>PACKAGING</b>           |                              |                    |                    |                       |                    |                       |                            |                        |                |                      |                   |  |                            |                      |                   |
| Paper Based                | Old Corrugated Containers    | 155,563            | \$ 483.48          | \$ 75,211,973         | \$ 113.15          | \$ 17,601,330         | \$ 370.34                  | \$ 57,610,643          | 34.5%          | 36.6%                |                   | \$ -                                   | 0.0%                       | 0.0%                 |                   |
| Packaging                  | Gabletop Cartons             | 3,576              | \$ 1,033.88        | \$ 3,696,837          | \$ 77.47           | \$ 277,026            | \$ 956.40                  | \$ 3,419,810           | 2.0%           | 2.2%                 |                   | \$ 5,293,492                           | 2.5%                       | 2.5%                 |                   |
|                            | Paper Laminants              | 393                | \$ 840.02          | \$ 330,039            | \$ -               | \$ -                  | \$ 840.02                  | \$ 330,039             | 0.2%           | 0.2%                 |                   | \$ 19,472,325                          | 9.3%                       | 9.4%                 |                   |
|                            | Aseptic Containers           | 784                | \$ 1,095.69        | \$ 858,754            | \$ 77.47           | \$ 60,721             | \$ 1,018.21                | \$ 798,033             | 0.5%           | 0.5%                 |                   | \$ 1,799,755                           | 0.9%                       | 0.9%                 |                   |
|                            | Old Boxboard                 | 85,092             | \$ 436.67          | \$ 37,157,337         | \$ 72.08           | \$ 6,133,250          | \$ 364.59                  | \$ 31,024,088          | 18.6%          | 19.7%                |                   | \$ -                                   | 0.0%                       | 0.0%                 |                   |
| <b>Paper Pack'g Total</b>  |                              | <b>245,408</b>     | <b>\$ 477.80</b>   | <b>\$ 117,254,941</b> | <b>\$ 98.09</b>    | <b>\$ 24,072,327</b>  | <b>\$ 379.71</b>           | <b>\$ 93,182,613</b>   | <b>55.8%</b>   | <b>59.2%</b>         |                   | <b>\$ 26,565,573</b>                   | <b>12.7%</b>               | <b>12.8%</b>         |                   |
| Plastic Packaging          | PET bottles                  | 28,240             | \$ 1,226.10        | \$ 34,625,279         | \$ 346.02          | \$ 9,771,706          | \$ 880.08                  | \$ 24,853,573          | 14.9%          | 15.8%                |                   | \$ 1,286,471                           | 0.6%                       | 0.6%                 |                   |
|                            | HDPE bottles                 | 15,717             | \$ 1,121.81        | \$ 17,631,037         | \$ 556.51          | \$ 8,746,418          | \$ 565.30                  | \$ 8,884,620           | 5.3%           | 5.6%                 |                   | \$ 399,617                             | 0.2%                       | 0.2%                 |                   |
|                            | Plastic Film                 | 4,220              | \$ 2,379.69        | \$ 10,043,470         | \$ 61.62           | \$ 260,088            | \$ 2,318.06                | \$ 9,783,382           | 5.9%           | 6.2%                 |                   | \$ 74,507,911                          | 35.6%                      | 35.8%                |                   |
|                            | Plastic Laminants            | 301                | \$ 2,379.69        | \$ 715,391            | \$ -               | \$ -                  | \$ 2,379.69                | \$ 715,391             | 0.4%           | 0.5%                 |                   | \$ 42,208,059                          | 20.2%                      | 20.3%                |                   |
|                            | Polystyrene                  | 777                | \$ 2,656.78        | \$ 2,063,447          | \$ 52.52           | \$ 40,788             | \$ 2,604.27                | \$ 2,022,659           | 1.2%           | 1.3%                 |                   | \$ 33,080,577                          | 15.8%                      | 15.9%                |                   |
|                            | Other Plastics               | 7,464              | \$ 1,341.12        | \$ 10,009,533         | \$ 164.59          | \$ 1,228,427          | \$ 1,176.53                | \$ 8,781,106           | 5.3%           | 5.6%                 |                   | \$ 29,769,653                          | 14.2%                      | 14.3%                |                   |
| <b>Plastics Total</b>      |                              | <b>56,718</b>      | <b>\$ 1,323.90</b> | <b>\$ 75,088,157</b>  | <b>\$ 353.46</b>   | <b>\$ 20,047,426</b>  | <b>\$ 970.43</b>           | <b>\$ 55,040,731</b>   | <b>33.0%</b>   | <b>35.0%</b>         |                   | <b>\$ 181,252,288</b>                  | <b>86.6%</b>               | <b>87.1%</b>         |                   |
| Steel Packaging            | Food and Beverage            | 31,317             | \$ 306.12          | \$ 9,586,724          | \$ 190.71          | \$ 5,972,425          | \$ 115.41                  | \$ 3,614,299           | 2.2%           | 2.3%                 |                   | \$ -                                   | 0.0%                       | 0.0%                 |                   |
|                            | Aerosols                     | 1,168              | \$ 306.12          | \$ 357,680            | \$ 190.71          | \$ 222,831            | \$ 115.41                  | \$ 134,849             | 0.1%           | 0.1%                 |                   | \$ 172,511                             | 0.1%                       | 0.1%                 |                   |
|                            | Paint Cans                   | 1,652              | \$ 306.12          | \$ 505,612            | \$ 190.71          | \$ 314,991            | \$ 115.41                  | \$ 190,621             | 0.1%           | 0.1%                 |                   | \$ 210,145                             | 0.1%                       | 0.1%                 |                   |
| <b>Steel Total</b>         |                              | <b>34,137</b>      | <b>\$ 306.10</b>   | <b>\$ 10,450,017</b>  | <b>\$ 190.71</b>   | <b>\$ 6,510,247</b>   | <b>\$ 115.41</b>           | <b>\$ 3,939,770</b>    | <b>2.4%</b>    | <b>2.5%</b>          |                   | <b>\$ 382,656</b>                      | <b>0.2%</b>                | <b>0.2%</b>          |                   |
| Aluminum Packaging         | Al Food & Beverage Cans      | 9,586              | \$ 995.63          | \$ 9,543,745          | \$ 1,933.23        | \$ 18,531,308         | \$ (937.61)                | \$ (8,987,563)         | -5.4%          | -5.7%                |                   | \$ -                                   | 0.0%                       | 0.0%                 |                   |
|                            | Other Aluminum Packaging     | 1,107              | \$ 995.63          | \$ 1,102,403          | \$ 1,933.23        | \$ 2,140,561          | \$ (937.61)                | \$ (1,038,158)         | -0.6%          | -0.7%                |                   | \$ -                                   | 0.0%                       | 0.0%                 |                   |
| <b>Aluminum Total</b>      |                              | <b>10,693</b>      | <b>\$ 995.60</b>   | <b>\$ 10,646,148</b>  | <b>\$ 1,933.23</b> | <b>\$ 20,671,868</b>  | <b>\$ (937.61)</b>         | <b>\$ (10,025,721)</b> | <b>-6.0%</b>   | <b>-6.4%</b>         |                   | <b>\$ -</b>                            | <b>0.0%</b>                | <b>0.0%</b>          |                   |
| Glass Packaging            | Food and Beverage - Flint    | 76,687             | \$ 172.76          | \$ 13,248,511         | \$ 8.99            | \$ 689,600            | \$ 163.77                  | \$ 12,558,911          | 7.5%           | 8.0%                 |                   | \$ -                                   | 0.0%                       | 0.0%                 |                   |
|                            | Food and Beverage - Coloured | 18,295             | \$ 151.47          | \$ 2,771,193          | \$ 7.40            | \$ 135,422            | \$ 144.07                  | \$ 2,635,771           | 1.6%           | 1.7%                 |                   | \$ -                                   | 0.0%                       | 0.0%                 |                   |
| <b>Glass Total</b>         |                              | <b>94,982</b>      | <b>\$ 168.70</b>   | <b>\$ 16,019,704</b>  | <b>\$ 8.69</b>     | <b>\$ 825,022</b>     | <b>\$ 159.97</b>           | <b>\$ 15,194,682</b>   | <b>9.1%</b>    | <b>9.7%</b>          |                   | <b>\$ -</b>                            | <b>0.0%</b>                | <b>0.0%</b>          |                   |
| <b>PACKAGING TOTAL</b>     |                              | <b>441,938</b>     | <b>\$ 519.20</b>   | <b>\$ 229,458,966</b> | <b>\$ 163.21</b>   | <b>\$ 72,126,891</b>  | <b>\$ 356.00</b>           | <b>\$ 157,332,075</b>  | <b>94.2%</b>   | <b>100.0%</b>        |                   | <b>\$ 208,200,516</b>                  |                            |                      |                   |
| <b>TOTALS</b>              |                              | <b>929,529</b>     | <b>\$ 312.60</b>   | <b>\$ 290,602,763</b> | <b>\$ 132.99</b>   | <b>\$ 123,616,911</b> | <b>\$ 179.65</b>           | <b>\$ 166,985,852</b>  | <b>100.0%</b>  |                      |                   | <b>\$ 209,187,574</b>                  | <b>100.0%</b>              | <b>100.0%</b>        |                   |
| <b>Industry Allocation</b> |                              |                    |                    |                       |                    |                       |                            | <b>\$ 83,492,926</b>   |                |                      |                   |  |                            |                      |                   |