

# Extended Producer Responsibility For Packaging in Vermont

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## Summary

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In 1987 the Vermont Legislature passed Act 78 to reduce the environmental impact of waste disposal in Vermont. The primary goals of Act 78 were to reduce waste generation and significantly increase recycling.

By 2008 (the last year for which data are available) solid waste generation had actually increased 34 percent when compared to 1989.

In 2008 Vermont households spent roughly \$24 million to recycle an estimated 55,000 tons of residential materials. Residential recycling, when combined with business recycling, for which no data are available on costs, resulted in an estimated state-wide recycling rate of 33 percent. While some areas of Vermont achieve significantly higher recycling rates, other areas of the State have much lower rates. Most importantly, the overall, state-wide recycling rate has not changed significantly in the past five years, and remains well below the 40 percent recycling rate adopted in 1989 and the 50 percent recycling rate adopted in 2001 with the amended State Plan.

DSM believes that the only way for Vermont to begin to reduce per capita waste generation and achieve a State-wide recycling rate of 50 percent would be to reorganize the way that recovery of materials is organized, managed, and financed; requiring product and packaging producers to fund and manage a recovery system for recyclables, while requiring solid waste generators to pay for the full cost of solid waste collection and disposal through true Pay As You Throw (PAYT) pricing.

Extended Producer Responsibility (EPR) for packaging and paper has been implemented in Western Europe (beginning in 1991), in Japan and Korea, and across many of the provinces of Canada. EPR is an environmental policy approach under which the responsibility of industry for their products and packaging is extended to include management of the product or packaging at the end of their lifetime. Recycling rates have increased significantly with adoption of EPR, and local government expenditures on recycling have fallen, as financing and management of the system has moved to the producers of the packaging and paper products.

EPR would require that brand owners (e.g., Procter & Gamble, General Mills, McDonalds, Ben and Jerry's, Green Mountain Coffee Roasters, Coke, and Anheuser-Busch InBev) jointly establish an industry funded organization in Vermont to finance and manage the recovery of their packaging at the end of its lifetime. Many of these companies are already required to report their packaging composition to Wal-Mart here in the United States, and many companies doing business in Vermont that also do business in Europe or in Quebec or Ontario will be reporting on this material and funding the recovery of packaging and paper.

This paper examines whether it is time for Vermont to once again take the lead in the United States, modifying its solid waste management system, predicated on EPR for all products and packaging, coupled with PAYT financing of refuse collection and disposal.

DSM believes that a compelling case can be made for a comprehensive evaluation of EPR legislation in Vermont for the following reasons:

- Substantial increases (over what is currently being collected) in the recycling of packaging and paper generated by households and businesses often cannot compete economically against simple burial of these materials in Vermont landfills despite all of the environmental controls placed on landfills, and the surcharges enacted to subsidize diversion;
- While Vermont's bottle bill achieves high recovery rates for those beverage containers subject to the deposit, these recovery rates are achieved at relatively high unit costs when compared to curbside collection of other recyclables;<sup>1</sup>
- Operating two systems - one for beverage containers, and one for all other packaging and paper - robs both systems of the efficiencies necessary to reduce recycling costs;
- The cost of recycling is high because separate collection for recyclables typically costs significantly more than collecting the material as solid waste, and the value of the recovered material is not sufficient in most cases to make up the difference;
- The value of recovered materials are low because the virgin materials they compete against are priced significantly below their true cost due to a myriad of direct and indirect Federal subsidies, and the lack of an assessment of the true environmental costs (including the impact on climate change) associated with mining, transporting and manufacturing new materials; and,
- Municipalities and state and regional governments do not have the resources to influence packaging decisions, or further subsidize the cost of recycling, given all of the other demands on municipal and state revenues, and given the current State budget crisis.

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<sup>1</sup> See for example, *The Cost of Beverage Container Redemption in Vermont, Final Report, Prepared for the Vermont Agency of Natural Resources, Prepared by DSM Environmental Services, Inc., June 30, 2007* and *Analysis of Beverage Container Redemption System Options to Increase Municipal Recycling in Rhode Island, Prepared for the Rhode Island Resource Recovery Corporation, Prepared by DSM Environmental Services, Inc., May 2009.*

## Section 1: Vermont's Current Materials Recycling System

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Twenty-two years ago Vermont enacted comprehensive legislation designed to change the way Vermont managed solid wastes. Act 78 was based on the premise that open dumps and unlined landfills were environmentally unsound, and should be replaced by an infrastructure designed for the “greatest feasible reduction in the amount of waste generated” and diversion of the “maximum achievable” amount of material for recycling. The language of Act 78 included concepts that are as relevant today as they were 22 years ago:

*“The developed world continues to pollute the environment and add to the depletion of the world’s resources by burning and burying waste”*

*“Generators of waste should pay disposal costs that reflect the real costs to society of waste management and disposal”*

*“The Secretary shall consult with manufacturers of commercial products and packaging...the goal is to ensure that packaging and products sold are not an undue burden to the state’s ability to manage its waste.”*

Responsibility for reducing waste generation and increasing recycling was assumed to fall primarily on municipal government through the establishment of regional solid waste management districts. A number of solid waste districts formed as a result of Act 78. However, because Act 78 did not require that municipalities join solid waste districts, a wide variety of other types of institutional arrangements were also created. According to a January 2008 Solid Waste Report to the Legislature by the Vermont Agency of Natural Resources, “today there are 43 different solid waste planning entities in Vermont consisting of 9 solid waste management districts, 7 alliances, or groups of municipalities working together under less formal arrangements, and 27 independent municipalities”.<sup>2</sup>

In addition, due at least partially to a 1994 United States Supreme Court ruling restricting control of waste by government, the private sector has taken on a much greater role than envisioned by Act 78 in developing both the collection and processing infrastructure for recyclables in Vermont, as well as in-state waste disposal capacity; now collecting and disposing of the majority of waste, and probably the majority of recyclables.<sup>3</sup>

There are three primary ways to determine how well the resulting institutional arrangements and infrastructure are doing with respect to decreasing waste generation and increasing recycling 22 years after adoption of Act 78.

- Comparison of per capita waste generation in 1989 with per capita waste generation in 2009.
- Comparison of today’s estimated recycling rate with the recycling rate goals established in Act 78 and the subsequent State Plans.
- Comparison of the total annual cost associated with the current system to the estimated cost associated with significantly increasing diversion of materials.

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<sup>2</sup> Despite the large number of planning entities, solid waste districts cover municipalities representing roughly 87 percent of Vermont’s population.

<sup>3</sup> Although the private sector operates the majority of recyclables processing capacity in Vermont, much of the processing capacity is owned by solid waste districts.

## **Per Capita Waste Generation**

According to the 1989 Vermont Solid Waste Management Plan roughly 328,000 tons of waste was disposed in Vermont in 1987. Vermont's population in 1987 was estimated at 540,000 (rounded). That means that in 1987 the average Vermonter disposed of roughly 1200 pounds of solid waste per year, or 3.3 pounds per day.

Twenty years later Vermont's population of 621,000 (rounded) disposed of 420,000 tons of municipal solid waste (rounded) meaning that the average Vermonter is throwing away roughly 3.7 pounds per day. This represents a 12 percent *increase* in per capita disposal since enactment of Act 78.

In actuality, the increase is much greater. If we add the increase in material diverted to recycling and composting over the past 22 years, Vermonters are generating 34 percent more waste now than we were in 1987 (Table 1-1).

**Table 1-1  
Estimated Disposal and Recycling, Total Tons and Per Capita,  
1987 and 2008 (1)**

<b>Year</b>	<b>Population (persons)</b>	<b>Disposed (tons)</b>	<b>Recycled (tons)</b>	<b>Total Generation (tons)</b>	<b>Per Capita (lbs)</b>
1987 (2)	540,000	328,000	73,900	<b>401,900</b>	<b>4.1</b>
2008	621,270	419,597	209,499	<b>629,096</b>	<b>5.5</b>

- (1) Source: 1989 Vermont Solid Waste Management Plan and 2008 Vermont Agency of Natural Resources data adjusted for bottle bill returns material
- (2) Data from 1987 were limited, based on surveys and other limited data available at that time.

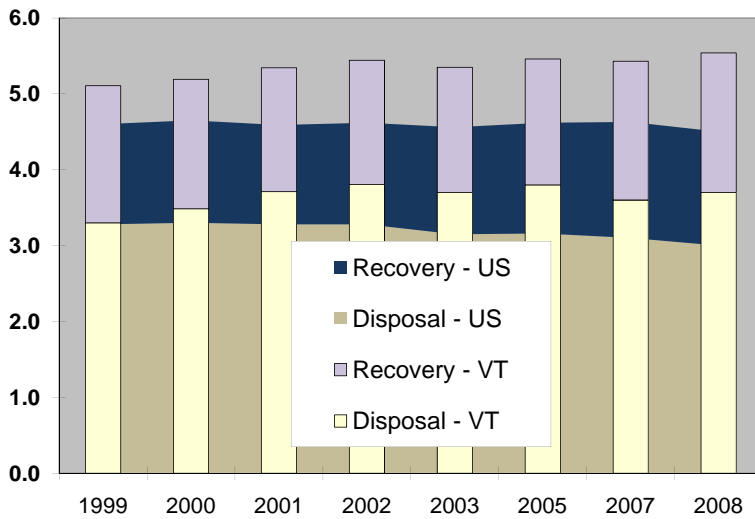
Figure 1-1 compares per capita generation (disposal plus recycling) in Vermont against per capita generation in the United States. As illustrated by Figure 1-1, the data indicate Vermonters generate more than the national average, although they also recycle slightly more than the national average.<sup>4</sup>

In summary, despite Vermont's best efforts to reduce waste generation over the past twenty years, per capita waste generation has actually increased significantly. The 1989 Plan recognized how hard it would be to impact waste generation when it stated "*Solid waste generation is influenced by multiple factors operating at international, national, state, regional and local levels. Many of these factors are controlled not by the state or regions, but by markets, the private sector and the federal government*".

The conclusion must be that reducing waste generation can not be accomplished by Vermont acting alone. Instead there will be a need to engage the producers of packaging and products in this long-term effort.

<sup>4</sup> Both Table 1 and Figure 1 ignore Construction and Demolition Waste.

**Figure 1-1  
Comparison of Per Capita MSW Generation (Disposal and Diversion) in Vermont  
and in the United States (1999 – 2008)<sup>5</sup> (Pounds Per Capita)**



### **Vermont’s Recycling Rate**

There were insufficient data in 1989 to calculate a state-wide recycling rate. However, the 1989 Plan did establish a state-wide goal of 40 percent, which was revised upward to 50 percent in the revised state plan (2001). These goals were established with the knowledge that roughly 80 percent of the material generated in Vermont is *potentially* recyclable.

Table 1-2 presents the best estimate of Vermont’s recycling rate over the past five years; including material processed at recycling facilities in Vermont, bottle bill material, “economic recycling”,<sup>6</sup> recovery of organics (food waste and yard wastes), and scrap metal. It should be noted here that Vermont only collects annual data on recycling quantities from recycling processing and organics management facilities; therefore, data on bottle bill, scrap metal and economic recycling are based on the most recent data available and assumed to remain relatively constant in subsequent years.

As illustrated by Table 1-2, Vermont’s recycling rate is currently estimated to be 33 percent. About one-half of the material reported as recycled in Table 1-2 is comprised of materials managed by municipalities, solid waste districts and the private sector, which were a direct, or indirect result of Act 78 and the Vermont State Solid Waste Plan. Most of the additional material being recycled would be recycled irrespective of state and district efforts.

<sup>5</sup> US Data for 2003 – 2008 from “Municipal Solid Waste Generation, Recycling, and Disposal in the United States Detailed Tables and Figures for 2008. U.S. Environmental Protection Agency Office of Resource Conservation and Recovery. Prior to 2003 data from US EPA “Characterization of Municipal Solid Waste in the United States”, 2006. Vermont Data from VT ANR Disposal and Diversion Reports.

<sup>6</sup> Economic recycling is typically recycling of material from business and industry that does not go through conventional recycling collection and processing but instead is material brokered directly between a business and a materials broker. Examples include: corrugated containers baled by a supermarket, sent back to their central warehouse, and then sold to a broker; and, large quantities of print overruns or cuttings picked up directly by a paper broker.

**Table 1-2  
Reported State-wide Recycling Rate Including Economic Recycling (1)**

<b>Type of Recycling</b>	<b>2003 (tons)</b>	<b>2005 (tons)</b>	<b>2007 (tons)</b>	<b>2008 (tons)</b>
Recycling Facilities (2)				
Paper	46,610	49,994	60,694	63,696
Containers	14,284	10,995	18,475	14,519
Bottle Bill Material	13,700	18,800	18,800	18,800
Economic Recycling (3)	33,877	33,877	33,877	33,877
Scrap Metal (4)	35,240	35,240	35,240	35,240
Organics (5)	39,677	32,726	33,500	36,112
Misc	2,167	7,348	7,085	5,179
<b>Total</b>	<b>185,555</b>	<b>188,980</b>	<b>207,671</b>	<b>207,424</b>
<b>Disposed</b>	<b>418,035</b>	<b>431,230</b>	<b>441,699</b>	<b>419,957</b>
<b>Recycling Rate, Recycling Facilities and Bottle Bill Only:</b>	<b>15%</b>	<b>16%</b>	<b>18%</b>	<b>19%</b>
<b>State Recycling Rate</b>	<b>31%</b>	<b>30%</b>	<b>32%</b>	<b>33%</b>

TABLE NOTES:

(1) ANR Disposal and Diversion Data from "Solid Waste Management Annual Solid Waste Diversion & Disposal Reports".

(2) Often referred to as "Municipal Recycling."

(3) Data from survey of economic recycling in 2001.

(4) Data from survey of scrap metal processors in 2001.

(5) Data from facilities managing food waste, liquid food waste (ice cream), manure, etc.

While Vermont's recycling rate is estimated to have increased by two percentage points over the past five years,<sup>7</sup> Vermont, as a whole, has not achieved a recycling rate of 40 percent, as originally laid out in the 1989 Solid Waste Management Plan, much less the 50 percent recycling rate laid out in the August 2001 Plan, readopted in its entirety in September, 2006.

It is DSM's opinion that significant increases in the recycling rate have not occurred for three reasons. First, heavy, and easily recycled, but low value materials such as glass have been replaced by light weight, and often difficult to recycle packaging. Second, with the exception of the Chittenden and Addison districts, there has been little new investment in parallel collection systems (for those households receiving curbside or roadside collection), residential carts, and other infrastructure known to increase residential recycling. Third, many districts and municipalities have not been willing to move to true Pay as You Throw (PAYT) pricing for solid waste collection, despite the documented increases in recycling that PAYT pricing would achieve. This is due, in part, because in the majority of Vermont, solid waste collection is not a municipal service and is largely unregulated, except for imposition of a solid waste surcharge. Without regulation to create a level playing field for all private haulers, it is difficult for haulers to compete with other haulers if they impose true PAYT pricing on their customers.

<sup>7</sup> The quality of the data on recycling is not accurate enough to know with any certainty whether the change over the past five years is the result of increased recycling or changes in reporting.

## **Cost of Current System**

The estimated average cost of Vermont's recycling system, and the related per ton costs, are presented in Table 1-3, below. These costs have been estimated based on limited available information, including an analysis of District and ANR costs completed by DSM for the Vermont Solid Waste Working Group in 2008, and are based on the following assumptions:

- Municipal curbside recycling is provided to roughly 14 percent of Vermont households at an average cost of \$4 per household served per month; and on average, 450 pounds per year is set out for recycling per household served;
- Subscription curbside recycling is provided to roughly 19 percent of Vermont households at an average price of \$6.50 per month (whether it is embedded in the cost of refuse collection or not); and on average 660 pounds is set out for recycling by subscribing households<sup>8</sup>;
- Drop-off recycling is provided through municipal and district drop-offs and transfer stations at an average cost of \$125 per ton, which covers the fully allocated cost of offering recycling at that facility, any processing costs at that facility and the cost to transfer material collected to a processing facility or end market;
- Roughly 37,300 tons of residential material from the curbside and drop-offs are processed at one of Vermont's Materials Recovery Facilities (MRF's) at an average cost of \$22 per ton, net of material revenues<sup>9</sup>.

Table 1-3 also includes annual costs of the bottle bill system, based on the 2007 study, *The Costs of Beverage Container Redemption in Vermont*, conducted by DSM for the Agency of Natural Resources. The *Beverage Container Redemption* study assumed the following:

- Approximately 229 million containers were returned for deposit, costing beverage distributors about \$8.1 million at the current handling fee of 3.5 cents per container;
- An additional \$2.9 million was spent by the beverage industry on collection, materials processing and administration of the bottle bill return system; and,
- Approximately \$2.8 million in scrap value (revenue) was retained by the distributors/bottlers.

Finally, there are two additional costs of the system which must be considered as part of the cost of recycling. These are:

- The estimated costs of solid waste district administration and education to support recycling programs. DSM has assumed that roughly 40 percent of total reported district "soft" costs of \$4.5 million are dedicated to recycling related administration and education; and,

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<sup>8</sup> Subscription recycling means that a household must sign up for the service and pay extra for it. Subscription recycling is required in Chittenden County, and is probably offered to most of Vermont's households, however it is assumed that only 25 % of the households subscribe to the collection service because of the additional cost above refuse collection alone. However, because these households have to pay extra for the service, they tend to be good recyclers.

<sup>9</sup> This is an average processing cost statewide, net of revenues, and varies year to year.

- The estimated costs of consumer transportation to participate in recycling and bottle redemption by making an extra trip or driving out of their way to recycle or redeem beverage containers.<sup>10</sup>

As illustrated by Table 1-3, DSM estimates that Vermonters spent roughly \$24 million to recycle residential material in 2008. Dividing by the total tons recycled, the average per ton recycling cost is estimated to be \$430/ton.

The \$24 million can be allocated to three major categories:

- \$9.7 million in curbside and drop-off education, collection and processing by districts, municipalities and the private sector;
- \$8.1 million in beverage industry and Vermont Liquor Control Agency costs to manage bottle bill returns; and,
- \$6.2 million in household costs associated with driving out of their way to drop-offs and redemption centers.

Important observations about Vermont's recycling costs include:

- Drop-off recycling appears to have lower per ton costs than curbside collection, but when the cost to the individual to transport material to the drop-off is included, total costs are higher than curbside (or roadside) collection, at an estimated \$300 per ton (rounded).
- Municipal (or organized) curbside collection has the lowest per ton cost at an estimated \$212 per ton.<sup>11</sup>
- Subscription curbside offered by private waste haulers is the next lowest cost, estimated at \$236 per ton. These costs are higher than organized collection because multiple haulers may travel the same routes to collect recyclables.
- The bottle bill is the highest cost recycling program, at an estimated \$687 per ton when the cost to the consumer to return the containers for the deposit is included.

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<sup>10</sup> DSM has surveyed consumer behavior at recycling drop-offs in Columbus, Ohio, Delaware, Knoxville, Tennessee, East Central Iowa, and Vermont; and at redemption centers in Massachusetts in 1999 and 2008 to determine how many miles recyclers and redeemers drive out of their way for the sole purpose of recycling or redeeming containers.

<sup>11</sup> Costs for "economic recycling" are not known but are likely to be lower than curbside collection because they typically include higher volumes of homogeneous materials.

**Table 1-3  
Estimated Current Costs of Residential Recycling in Vermont  
(CY 2008 Estimates)**

	<b>Total Cost of Activity (\$)</b>	<b>Estimated Quantities (4) (tons)</b>	<b>Cost/Ton (\$)</b>
<b>RESIDENTIAL RECYCLING</b>			
<b>Curbside Collection</b>			
Subscription	\$3,822,000	16,200	\$236
Municipal	\$1,632,000	7,700	\$212
<i>Subtotal, Curbside</i>	<b>\$5,454,000</b>	23,900	<b>\$228</b>
<b>Drop-off Collection</b>			
District (1)	\$1,176,170	8,400	\$140
Municipal	\$500,000	5,000	\$100
<i>Subtotal, Drop-off</i>	<b>\$1,676,170</b>	13,400	<b>\$125</b>
<b>TOTAL COLLECTION</b>	<b>\$7,130,170</b>	37,300	<b>\$191</b>
<b>PROCESSING - Net Costs</b>	<b>\$673,000</b>	37,300	<b>\$18</b>
<b>DISTRICT ADMIN COSTS</b>	<b>\$1,800,000</b>	37,300	<b>\$48</b>
<b>Subtotal, Residential Recycling:</b>	<b>\$9,603,170</b>	<b>37,300</b>	<b>\$257</b>
<b>BOTTLE BILL (2)</b>			
Handling Fee	\$8,007,000	17,500	<b>\$458</b>
Collection, Processing and Accounting	\$2,929,000	17,500	<b>\$167</b>
Scrap Value	(\$3,100,000)	17,500	<b>-\$177</b>
<b>Subtotal, Bottle Bill:</b>	<b>\$7,836,000</b>	<b>17,500</b>	<b>\$448</b>
<b>VERMONT LIQUOR CONTROL (3)</b>	270,000	1,300	<b>\$208</b>
<b>TOTAL BASELINE COST:</b>	<b>\$17,709,170</b>	<b>56,100</b>	<b>\$316</b>
<b>OTHER COSTS - Consumer Transport</b>			
Drop-off Recycling	\$2,087,000	13,400	<b>\$156</b>
Bottle Bill Returns	\$3,798,000	17,500	<b>\$217</b>
<b>TOTALS INCLUDING OTHER COSTS</b>	<b>\$23,594,170</b>	<b>56,100</b>	<b>\$421</b>

(1) From District estimates of hard Costs of Recycling, 2008 Report to the Legislature.

(2) Unclaimed deposits are not included in net cost but are estimated at \$2.8 million. Does not include liquor bottles.

(3) Estimates for collection only from 2006, Vermont Liquor Control Office. The sum of Bottle Bill and Liquor Control costs equal total bottle bill costs.

(4) Rough estimates of residential tons collected by collection method. No data available on residential material only.

(5) Numbers may not add due to rounding.

## ***What Would It Cost to Substantially Increase Recycling in Vermont?***

Table 1-4 presents DSM's best estimate of Vermont's total cost to recover an estimated 83,000 tons of material from households and from bars and restaurants. This excludes commercial recycling, "economic" recycling, organics composting and scrap metal recovery, which are all important to the State recycling rate but are outside of the control of most municipal recycling programs.

Increasing residential recycling (including bottle bill material) by roughly 27,000 tons, which DSM believes is potentially achievable based on high achieving areas of the United States, would require a combination of new investment in infrastructure, and improved operational efficiencies. This would start with:

- Providing parallel curbside collection of recyclables to all households with curbside refuse collection with the cost of recycling "embedded" in the monthly refuse collection cost (note that this would also significantly reduce household travel costs to deliver recyclables);<sup>12</sup>
- Assuring that all drop-off refuse customers also have access to drop-off recycling at the same location;
- Implementation of a true PAYT rate structure for solid waste for all Vermont households, including both private and public curbside and drop-off collection<sup>13</sup>;
- Adding, or upgrading an existing materials recovery facility to single stream processing to serve the southern part of the state;<sup>14</sup>
- Investments in single stream recycling collection and transfer equipment at transfer stations and drop-off facilities wherever it was more cost effective to process the recyclables off-site as opposed to process them at the transfer facility;
- Replacement of the beverage container redemption system with parallel access to recycling for all Vermont households (as described above), financed with an EPR levy for all packaging;
- Mandatory recycling for all households and businesses in Vermont, with a requirement for consistent municipal/district recycling programs state-wide to free up overlapping responsibilities (and costs), and assure consistent messaging and access to the same types of high performing programs everywhere in Vermont; and,
- Investment in a continuing state-wide education and promotion program to encourage participation, at home, at work, and "on the go".

In addition, because carbonated beverages would no longer be covered under a redemption system, DSM believes that there would be a need to mandate glass recycling at bars and restaurants to ensure that on-premise container recycling rates remain high. This system could

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<sup>12</sup> Households and small businesses currently using a transfer station for refuse disposal would continue to use the same transfer station provided they had access to comprehensive recycling at that transfer station.

<sup>13</sup> DSM recognizes that full PAYT pricing could, in essence, be viewed as a regressive tax on low income Vermonters. However, as DSM has learned from our efforts to adequately fund water and solid waste systems in developing countries, avoiding the correct pricing mechanism for the majority of the population to help a small portion of the population is the wrong approach. Instead efforts should be made to reimburse low income households if PAYT pricing becomes too much of a burden, combined with education on how to reduce PAYT costs by composting and recycling.

<sup>14</sup> It is possible that the single stream recycling facility in Chittenden County would be sufficient to manage all recyclables in the State. Additional analysis of this option is necessary.

be modeled after a similar state-wide system in North Carolina, and could involve some type of a requirement for continued take back of these containers by the beverage distributors or an authority representing the EPR program.

Costs in Table 1-4 include both annualized capital costs (e.g. carts, transfer station and drop off facility equipment upgrades, and single stream processing upgrades) and total annual O&M costs for recycling. They exclude current district administrative costs associated with recycling, replacing these costs with a straight \$25 per ton administrative cost to cover the costs of reporting and tracking recycling, and instituting and enforcing state wide PAYT programs. An additional \$8 per ton cost for education and outreach has also been included.

As illustrated by Table 1-4, DSM estimates that system-wide costs could actually be reduced by roughly 30 percent under this proposed system, even when more material is handled, when compared to the total system costs of the existing system. This is primarily because of the relative inefficiencies of the existing system which:

- Relies on individual households to drive relatively small quantities of recyclables and beverage containers to drop-offs and redemption centers;
- Requires a relatively inefficient, second system to collect (and repeatedly count) carbonated beverage containers; and,
- Involves a patchwork of institutional solid waste management arrangements, administered unevenly throughout the State.

**Table 1-4**  
**Estimated Cost of Enhanced Municipal Recycling in Vermont**

	Estimated Costs (\$)	Estimated (tons)	Cost/Ton (\$)
<b>RESIDENTIAL RECYCLING</b>			
<b>Curbside Collection</b>			
Carts	\$1,257,888		
Organized	\$8,067,123	44,800	\$180
Municipal	\$1,836,000	10,200	\$180
<i>Subtotal, Curbside</i>	\$11,161,010	55,000	\$203
<b>Drop-off Collection</b>			
Capital	\$531,189		
O&M	\$2,562,500	20,500	\$125
<b>TOTAL COLLECTION</b>	<b>\$13,723,510</b>	<b>75,500</b>	<b>\$182</b>
<b>PROCESSING</b>			
Capital Investment	\$796,783	75,500	\$11
O&M	\$1,362,239	75,500	\$18
<b>OTHER COSTS</b>			
Administrative and Management	\$1,887,500	75,500	\$25
Education and Marketing	\$604,000	75,500	\$8
<b>TOTAL COSTS:</b>	<b>\$18,374,032</b>	<b>75,500</b>	<b>\$243</b>
<b>COMMERCIAL RECYCLING</b>			
On-premise and other	\$937,500	7,500	\$125
<b>TOTAL ANNUAL SYSTEM COST</b>	<b>\$19,311,532</b>	<b>83,000</b>	<b>\$233</b>

While the costs in Table 1-4 are rough estimates at best, they illustrate the potential value in investing in a single system for collection and recycling of residential materials in Vermont. Tables 1-3 and 1-4 ignore the costs of commercial recyclables, which are also handled at Vermont's material recovery facilities, transfer stations and drop-offs. While these costs are outside of municipal costs, they are also an important part of increasing materials recovery in Vermont and will have to be estimated and included in any EPR fees that would ultimately be established.

### **What Recycling Rate Might Vermont Achieve Under EPR?**

Increasing Vermont's recycling rate will require increased recycling from both the residential and commercial sector. Estimated current recovery rates for residential and commercial packaging and paper are presented in Table 1-5. The recovery rates presented in Table 1-5 must be considered **rough estimates only** because despite the emphasis in the 1989 State Solid Waste Management Plan on the collection and analysis of state-wide data, large gaps remain today in the quality of recycling and disposal data by material type in Vermont.

**Table 1-5  
Vermont's Estimated Current Material Recovery Rates,  
(2008)**

<b>Material</b>	<b>Recycled (1) (2) (tons)</b>	<b>Disposed (3) (tons)</b>	<b>Total Material (tons)</b>	<b>Recovery Rate (%)</b>
<b>Paper</b>	63,522	76,000	139,522	46%
<b>Containers</b>				
Glass (3)	21,300	12,200	33,500	64%
PET	1,700	5,000	6,700	25%
HDPE Bottles	1,200	2,600	3,800	32%
Aluminum Cans	2,100	330	2,430	86%
Steel Cans, Other Plastics	2,750	14,670	17,420	16%
<b>Total Containers:</b>	29,050	34,800	63,850	45%
<b>Total:</b>	<b>92,572</b>	<b>110,800</b>	<b>203,372</b>	<b>46%</b>

TABLE NOTES:

(1) ANR Diversion Data from "Solid Waste Management Annual Solid Waste Diversion & Disposal Reports." (2008)

(2) Includes deposit return estimates from Northbridge Environmental (2006).

(3) Material Composition based on VT Waste Composition Study, 2002.

(4) DSM believes glass recovery may be over reported but cannot verify this.

Drawing from Germany's experience with EPR schemes (reviewed in Section 2, below), and applying Germany's 2006 reported recovery rates by material<sup>15</sup> to Vermont's waste stream would result in significant increases in materials recovery in Vermont. Table 1-6 presents current (2006) German recovery rates by material type, as well as Germany's Packaging Ordinance material recovery rate targets.<sup>16</sup>

<sup>15</sup> European Commission, Environmental Data Centre on Waste, Germany Packaging Waste Data for 2006 (updated December, 2008) and found at <http://ec.europa.eu/environment/waste/packaging/data.htm>.

<sup>16</sup> German Packaging Ordinance, April 1, 2009, Annex 1, "Requirements for Recovery of Sales Packaging Arising at the Private Final Consumer."

**Table 1-6 Germany's Current Targets and Actual Material Recovery Rates**

<b>Material</b>	<b>Current Target (1) (%)</b>	<b>Reported Rate (2) (%)</b>
Glass	75%	82%
Tinplate	70%	90%
Aluminum	60%	77%
Paper, cardboard	70%	80%
Plastics (3)	60%	41%
Composites (3)	60%	

(1) German Packaging Ordinance, April 1, 2009, Annex 1, "Requirements for Recovery of Sales Packaging Arising at the Private Final Consumer"

(2) European Commission, Environmental Data Centre on Waste, Germany Packaging Waste Data for 2006 (updated December, 2008). ([ec.europa.eu/environment/waste/packaging/data.htm](http://ec.europa.eu/environment/waste/packaging/data.htm))

(3) Composites recycled with their principal material component unless recycling of a different material component approximates more closely to the objectives of closed substance cycle management, and that the other components are also recovered. At least 60 percent of plastic packaging must be consigned to recovery and at least 60 percent of this recovery quota shall be ensured by processes in which new material of the same substance is replaced or the plastic remains available for further use as a material (mechanical recycling).

If Vermont were to achieve the material recovery rates reached by Germany in 2006 (See column "Reported Rate" in Table 1-6), Vermont's estimated resulting recycling rate would be roughly 43 percent, or 10 percent higher than the current estimated rate of 33%. This would move Vermont significantly closer to the 50 percent recycling goal established in the Vermont Plan. Table 1-7 illustrates how Vermont's rate is currently calculated and how much it would increase if Vermont achieved the same materials recovery rates as Germany's reported rates.<sup>17</sup>

Increased diversion of organics in Vermont could then be used to close the gap and achieve a 50 percent goal.

DSM recognizes that German companies have had twenty years of responsibility under the German Packaging Ordinance, and that achieving similar recovery rates in Vermont would require significant investments over time in collection, processing and end-use markets. However, as discussed above, Vermont has also had twenty years to achieve the 40 percent recycling goal laid out in 1989, and still has not achieved this goal.

<sup>17</sup> DSM has researched what impact the German ordinance had on materials recovery rates in Germany. DSM has not been able to find a definitive source, although two sources report (without accompanying documentation) a 60% increase and a 100% increase during the five to seven years, respectively, following implementation of the DSD system.

**Table 1-7  
 Comparison of Vermont's Current Recycling Rate With the Projected Rate  
 if Vermont Were to Achieve Germany's Actual 2006 Material Recovery Rates  
 for Fibers and Containers**

<b>Material</b>	<b>2008 (tons)</b>	<b>EPR (tons)</b>
<b>Paper, cardboard and other fiber</b>	<b>60,391</b>	<b>112,176</b>
<b>Containers</b>	<b>14,042</b>	<b>45,125</b>
Economic Recycling	33,877	33,877
Scrap Metal	35,240	35,240
Organics	36,112	36,112
Misc	9,901	5,179
Bottle Bill Material	18,800	0
<b>Total MSW Recycling:</b>	<b>208,363</b>	<b>267,709</b>
<b>MSW Disposal:</b>	<b>419,957</b>	<b>360,611</b>
<b>Vermont Recycling Rate</b>	<b>33%</b>	<b>43%</b>

## Section 2: Extended Producer Responsibility<sup>18</sup>

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There are approximately 50 national or provincial EPR programs for packaging currently in place around the world. The purpose of EPR programs is to make the producer of the product (or packaging) responsible for management and recovery at the end of its lifetime, with the intent of forcing the producer to consider the impact of the product package once it has served its useful purpose. This is in contrast to current system in Vermont (and throughout the United States) where the collection and recycling of the package or product is the responsibility of the household or business, and the local municipality or regional government, with costs financed through payment to a private waste collection company, or municipal taxes or fees.

Because the product (or packaging) producer does not currently bear these management and recycling costs in the United States, there is less of an economic incentive for the producer to reduce the quantity or toxicity of the package; to design the product or packaging for recycling; or to increase the use of recycled material.

The ways in which EPR has been imposed on industry around the world can be divided into three general categories. A summary of each is provided below, to help determine whether Vermont could borrow from one or more of these general approaches to formulate an EPR for packaging that could be implemented in Vermont.

The three general approaches are:

- The product or packaging producers are **physically and financially responsible** for taking back the product or package and achieving some level of recycling for each material (full producer responsibility);
- The product or package producer has **financial responsibility** for management of the product or package at the end of its lifetime, but physical responsibility continues to rest with government and the waste generator; or,
- The product or package producer **shares responsibility** (and cost) for managing the material at the end of its lifetime with the generator and government.

### **Full Producer Responsibility**

Because the German system is the original EPR for packaging, and is the model for many additional EPR systems, the German Packaging Ordinance and the key implementation issues are summarized here.<sup>19</sup> Authority for the Packaging Ordinance came from the 1986 “Waste Avoidance and Waste Management Act” authorizing the Federal Government to regulate the flow of packages and products so they could be returned for environmentally friendly reprocessing.

The Packaging Ordinance regulated three types of packaging:

- *Transport* – packaging used to ship goods to retailers (e.g., pallets, corrugated containers);

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<sup>18</sup> This summary borrows from the available literature, including especially from *Analytical Framework for Evaluating the Costs and Benefits of Extended Producer Responsibility Programmes*, Organization for Economic Co-Operation and Development, March 2005 (env/epoc/wcwr (2005)6/final)

<sup>19</sup> Key components of this summary are taken from *Germany, Garbage, and the Green Dot, Challenging the Throwaway Society*, Bette K. Fishbein, Inform, Inc., NY, NY, 1994.

- *Secondary* – packaging over and above the primary package designed to facilitate self storage, prevent theft, or market the product (e.g., the box over a tube of toothpaste, blister packs);
- *Primary* – the package that contains the product (e.g., the tube of toothpaste, peanut butter jar, box holding screws).

Under the Packaging Ordinance, industry was responsible for taking back, reusing or recycling each of these three packaging categories. Implementation was phased in with industry responsible for taking back, reusing or recycling transport packaging at the end of the first year of adoption of the ordinance. Retailers were responsible for the installation of recycling bins for secondary packaging with 18 months of adoption of the ordinance, and for acceptance of primary packaging within 24 months of adoption.

Regulation of transport and secondary packaging took effect on schedule. However there was a provision in the Packaging Ordinance providing an exemption to the requirement for retailers to take back primary packaging if industry proposed an alternative, privately financed plan that could meet the specified goals for collecting and recycling packaging materials. Industry did step forward with a privately financed Producer Responsibility Organization (PRO) called the Duales System Deutschland GmbH (DSD).<sup>20</sup>

One key to the Packaging Ordinance was that it established collection and recycling targets for packaging, by material type. The European Union subsequently established overall EU targets, with country specific targets, depending on the maturity of the recycling programs in each EU country. Current (2006) materials recycling (recovery) targets and 2006 actual materials recycling (recovery) rates, by material type are presented for Germany in Table 1-6 above. As illustrated by Table 1-6, industry in Germany has achieved a 67 percent recycling rate for all packaging materials in Germany, and is well on its way to achieving the EU target of 74 percent.

The DSD system is entirely privately funded and operated. Any company wishing to participate (and therefore not impose a requirement on retailers to separately collect its packaging) must pay a fee to DSD based on the packaging material and the quantity expected to be sold in Germany in that year. The DSD then makes arrangements to collect the material. In most cases the DSD contracts with the existing waste management companies and municipal collection entities to collect the packaging material.

One hundred percent of the cost of the collection system for packaging materials is paid for by the DSD fees (and ultimately, the consumer). Fees vary based on the material type, and the ease of recycling, and are charged on a weight basis.

### ***Producer Is Financially Responsible Through a Product Fee***

The concept of some type of product fee was originally proposed as part of the U.S. Resource Conservation and Recovery Act (RCRA) adopted in 1976. Unlike the German system where the packaging producer has a physical responsibility to take back and recycle packaging materials, a product fee is typically levied at the time of sale, and provides a *financial* responsibility for recycling, although the actual *physical* responsibility remains with the public sector (under current Vermont law) and the private waste management companies which collect the majority of residential and commercial waste in Vermont.

While product fees were never adopted as part of RCRA, they have been imposed by a number of states, primarily on hard-to-manage materials such as tires and automotive batteries.

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<sup>20</sup> Ibid, p. 22.

It is possible to envision imposition of a product fee for packaging and paper that moved Vermont toward reduced packaging and increased recycling. The key would be to create and levy the product fee based either on the quantity of packaging and paper produced, as opposed to sales revenue, or ideally, on the life cycle impact of each type of package.<sup>21</sup>

Both of these types of levies would require a significant investment, either by the State, or some Industry Funded Organization in data collection.<sup>22</sup> Fees would be assessed against the quantities of packaging placed on the Vermont market by the producers in a given program year.

Based on Table 1-5, above, packaging and paper generation in Vermont represent roughly 203,000 tons. One could raise \$20 million (roughly what DSM estimates would be necessary for an efficient recycling collection and processing system for municipal solid waste in Vermont) to fund recycling through imposition of a charge of roughly 5¢ per pound of packaging and paper sold in Vermont.

To help assure that the product fee was not subsumed by the General Fund, the product fee could be assessed by an Industry Funded Organization, with the fees paid by the Industry Funded Organization to existing private and public recycling entities based on the cost to collect recyclables.

The product fee should be refined by modifying the material specific fee rates based on state-wide recycling reporting for each obligated material. The product fee could be further refined by calculating the charge based on the lifecycle impact of each packaging material. While it may seem beyond the realm of possibility in Vermont, many of the major product/packaging producers already are required to provide this information to Wal-Mart, and many of the fast food chains already gather these data for their packaging.

### ***Shared Responsibility***

As discussed above, it is possible to structure an EPR for packaging that requires some form of shared financial and physical responsibility for managing packaging waste. The U.S. EPA promotes this type of shared responsibility using the term “Extended Product Responsibility”, implying a role for the packaging producer, the retailer, the consumer, and government. The current Ontario and Quebec models can be used as an example of this type of shared responsibility option.<sup>23</sup> The system established in Ontario is summarized below.

#### ***Ontario’s System***

Ontario’s Waste Diversion Act (WDA) was adopted on June 27, 2002. The Act established Waste Diversion Ontario as an organization with a mandate to develop, implement and operate a waste diversion program for “designated wastes”.

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<sup>21</sup> DSM recognizes that this product fee will be passed on to the consumer in most cases, and therefore can be viewed as a regressive tax. However, costs for disposal of the resulting waste material are either already paid for by the consumer in the cost of their collection and disposal service, or through property taxes, which can also be a regressive tax when not linked to ability to pay.

<sup>22</sup> In this case the more descriptive term is Industry Funded Organization, as opposed to a Producer Responsibility Organization because industry would not have responsibility for physically collecting the packaging, but only funding the collection by existing organizations.

<sup>23</sup> It should be noted that Ontario is proposing to replace the shared funding of Stewardship Ontario with a model based on 100% funding and management by the printing and packaging stewards. Quebec’s system is very similar to the existing shared responsibility Ontario system.

The Ontario Ministry of Environment implemented broad framework legislation that allowed for the designation of a wide range of waste materials for increased diversion. The first material designation under the Act was printed paper and packaging. Stewardship Ontario, the Industry Funding Organization established to design and implement the program initially adopted a waste diversion program for packaging and printed materials generated by households (the “blue box” material set out at the curbside for recycling). Stewardship Ontario is currently responsible for funding 50 percent of the net cost of collection of “blue box” materials, as well as funding activities to promote system improvements and to promote improved markets for hard to recycle materials. The other 50 percent is currently funded by municipalities.

All brand owners and first importers are required to register as “Stewards”, annually report the total quantity of packaging supplied for use in Ontario, and pay fees based on the quantities and material composition.

All municipal recycling programs in Ontario (including those which contract the service to private operators) are required to submit detailed actual costs for collection, processing, transport and marketing of recycled materials) to Stewardship Ontario, together with quantities of recyclables collected and processed, by material type.

Stewardship Ontario then, allocates the costs to individual materials based upon activity based costing, the relative recycling rates achieved for each material, and a further adjustment to equitably share costs among those materials with high recycling rates and those with low recycling rates. Stewards are assessed a per kilo fee based on the reported quantity of each packaging and printed paper material.

Fees for 2008 ranged from 0.06 cents per pound for newspaper to 8.4 cents per pound for “other plastics” based on this allocation. Although paper and paper packaging dominate the total tonnage of packaging in Ontario, the cost allocation is skewed toward the lighter weight, and in some cases more difficult to recycle, plastic packaging.

The higher fees for difficult to recycle packaging (e.g., “blister packs” and laminates) serves two purposes. First, these higher material fees offset the costs of diverting other materials with much higher recycling rates. Second, the higher fees act as a financial incentive to producers to make changes to their packaging to reduce costs, as well as stimulate programs designed to recover greater quantities of these materials for recycling.

For example, by taking a comprehensive approach to recycling the widest possible range of recyclable materials roughly 75 percent of all Ontario households can now recycle injection molded plastic tubs and lids (e.g., yogurt cups, fruit and lettuce packs), which is significantly higher than U.S households. Furthermore, adoption of cost effective, single stream collection of recyclables is wide-spread in urban areas. Stewardship Ontario continues to make additional investments to overcome barriers to increasing recovery of materials across the whole of Ontario.

It is important to note that the current Stewardship Ontario program does not include commercial recyclables – only residential printing and packaging materials that would typically be set out in the residential “blue bin” recycling container. However, the Ontario Ministry of Environment is drafting revisions to the current legislation to extend stewardship responsibility for commercially generated recyclables in the future. The Ministry of Environment has also proposed moving from 50 percent funding responsibility to 100 percent funding by Stewardship Ontario. This would provide Stewardship Ontario with additional control over the design and operation of related recycling programs and therefore the costs of the blue box program.

### Section 3: Proposed EPR System for Vermont

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Additional research, over and above the information provided in this paper is necessary to determine if an EPR for packaging and paper is feasible for Vermont, and how it would ultimately work.

The recommended first step could be adoption of “Framework Legislation” establishing the framework within which EPR regulations for different materials might be enacted. Framework legislation was proposed in California, Oregon, Washington and Minnesota in 2009, and has been proposed in Maine in 2010.

Legislation could be adopted directing that brand owners and first importers propose a stewardship plan for packaging and paper; describing the scope of products to be covered, the funding mechanism, the proposed performance goals, and the collection and processing mechanism to achieve the performance goals. HB 696 has recently been introduced in Vermont to achieve this goal.

Key issues that need to be addressed to move forward with EPR for packaging in Vermont include the following.

#### ***Impact on Vermont Businesses***

As stated in the Introduction to this report, imposition of an EPR for packaging would have been much more onerous for companies doing business in Vermont five years ago than it is today. This is because most of the major brand owners selling consumer products in Vermont are now required to submit detailed information on their packaging to Walmart.<sup>24</sup> Similarly, the major franchise food chains doing business in Vermont also maintain these data on their packaging.<sup>25</sup> And, large grocery stores are currently working on development of a database for packaging of products sold in their stores, especially for products moving through their warehouses.<sup>26</sup>

Ontario exempts all brand owners and distributors who do less than \$2 million in business per year in Ontario. A key issue in Vermont would be to establish a small business cut-off dollar amount, estimate how many brand owners and importers would be required to submit data on packaging above the cut-off, and then determine the availability of data on packaging from these companies. As an alternative to exempting small businesses, or businesses selling small quantities of product in Vermont, Quebec sets a flat fee of roughly \$150 for those brand owners or first importers who would be exempt in Ontario.

Given the large quantity of packaging and paper generated in Vermont, and the relatively low cost of recycling significant quantities of these materials, it is probable that , the levy would be internalized by brand owners into the product cost, or so low that brand owners or first importers are not selling products at higher prices into the Vermont market. In other words, retailers are unlikely to see significantly higher costs (unlike the bottle bill handling fees) because the fees are

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<sup>24</sup> Telephone interview with Michelle Harvey, Walmart On-Site Project Manager, Corporate Partnerships, Environmental Defense Fund. All suppliers to Walmart (an estimated 60,000 to 70,000) are required to complete Walmart’s packaging scorecard.

<sup>25</sup> Telephone interview with Jennifer McCracken, Havi Global Solutions, Chicago, Illinois

<sup>26</sup> According to Steve Culver, Vice President Government Relations, Hannaford Bros. Co., Scarborough, Maine roughly two-thirds of all products sold at Hannaford Bros stores come through a Hannaford warehouse, for which some packaging information is available. Another third are direct delivery, and would require the brand owner to report packaging quantities. Some of these are large brand owners (Coke, Pepsi) while others may be small, regional or local suppliers without information on packaging.

spread over such a large amount of packaging and become internalized. However, this may not be the case for all packaging. Fees on hard to recycle, non-recyclable or high environmental impact packaging could be high enough to result in higher prices, and could signal that alternative packaging bears lower costs.

### ***Role of the Bottle Bill***

It is DSM's opinion that one key to a successful EPR for packaging in Vermont would be to eliminate the deposit on carbonated beverage containers and replace it with broad EPR requirements for all packaging, including beverage containers. This approach has two benefits. First, it does away with the dual system for managing recyclables that currently exists in Vermont, allowing all households and businesses to place all recyclables, including carbonated beverage containers at the curbside or at their transfer station. Second, it provides Vermont grocers and convenience stores with the ability to compete with stores in bordering states for the sale of carbonated beverages. This could help in convincing these stores to support the additional burdens associated with a comprehensive EPR for all packaging.

One key issue that must be addressed if the existing bottle bill is to be eliminated is how to assure that the current recovery rates for beverage containers continue under an EPR system. Two potential solutions are:

- Establish performance goals for beverage containers that must be maintained to avoid triggering new deposit requirements; and,
- Require mandatory recycling of on-premise beverage containers to assure continued access to a clean and stable supply of glass (especially) beverage containers.

### ***Materials to Include in the Initial EPR System***

Conceptually, a single organization for packaging and paper might make sense given the existing Walmart requirements and data already compiled by the large fast food restaurant chains. Given relatively high recycling rates for newspaper, especially, and the significant decline in newspaper size over the past several years, it might make sense to exempt newspapers provided that recovery rates remain above some performance trigger.

To assure that recovery occurs both at the household level and at work and on-the-go, any system should encompass both residential and commercial generation of packaging and paper (including corrugated containers), and should include both packaging that can be recycled and packaging that is not currently recyclable. Different fees can then be set based on the recyclability and, in the future, life cycle impacts of each packaging material.

Special or hard-to-handle materials (e.g., electronics, paints, fluorescent light bulbs) might better be kept separate with one or more producer responsibility organizations to manage these materials.

It might also be the case that recycling targets for packaging would result in an industry funded organization that did not physically handle the material, while management of hard-to-handle materials such as fluorescent light bulbs required a producer responsibility organization that both funded and managed the proper recycling and disposal of these materials.

## ***Funding and Control***

Funding and control of the EPR system will be a key issue that must be addressed. There is significant concern that any funding mechanism that can be appropriated by the Legislature will eventually move from a dedicated fund supporting recycling to a general fund revenue source. This has clearly been the intent of the recent expansions of the bottle bill in Connecticut and New York because it has been combined with state takeover of the escheats as a general fund revenue source. Massachusetts, one of the first states to take control of the escheats, originally dedicated all of the escheats (around \$35 million per year) for recycling and other environmental programs, but over time essentially subsumed the escheats into the general fund. Similarly, the budget crisis in California has resulted in California appropriating \$451 million in unredeemed deposits (escheats) for the general fund, requiring across the board cuts in funding for beverage container redemption centers in California.

The German system is an industry funded system where industry is 100 percent responsible for funding and managing the recycling system for all packaging, with the funds never available to the German government. Similarly, Stewardship Ontario is an industry funded system also, protecting the funds from use by the Provincial government, but in this case Stewardship Ontario does not have physical responsibility for managing the recycling system. The largest objection in Ontario has been that Stewardship Ontario therefore does not have control over recycling costs, and can not institute private sector, cost effective ways to reduce costs.

## ***Existing Infrastructure***

Solid waste districts, municipalities, and private industry have developed and financed significant infrastructure for the recovery of materials in Vermont. The relationship between any industry funded organization and existing public and private solid waste management entities will need to be clearly defined. It may be desirable for an industry funded organization to contract for collection and processing capacity, picking and choosing the most efficient providers in each region of the State; however this will have implications for the remaining public and private investment that already exists.

The issue of ownership of the resulting materials will also be a critical issue, given the investments that have already been made in collection and processing capacity in Vermont, which has made these investments with the intent of controlling the materials over time as the demand for secondary materials increases.

## ***Recovery Targets***

One of the keys to EPR legislation will be the establishment, and subsequent measurement of recovery targets for materials to assure that the EPR system established in Vermont meets the goals of significantly increasing materials recovery rates. One of the problems with preparing this paper has been the lack of high quality baseline data on commercial versus residential recycling and waste disposal quantities from which to measure current recovery. High quality data collection was a recommendation of the 1989 Plan which has never really been achieved in Vermont making it difficult to clearly define where Vermont is, and what are reasonable goals moving forward.

Any industry funded organization can require that its members provide data on quantities of packaging sold into Vermont in any given year. However, it will also be critical to obtain accurate data on recycling quantities by material type to assure that the performance goals are met. This will require accurate reporting, both to the industry funded organization as well as to a state regulatory agency to monitor performance.

### ***Pay As You Throw Pricing***

The final component of any new system for increased recycling in Vermont is the need to address true pay as you throw (PAYT) pricing for residential refuse. Over 7000 municipalities in the United States currently fund all or part of their refuse collection and recycling system through PAYT, where the generator is responsible for paying on a per bag or per container basis for all refuse collected for disposal. PAYT has been shown to be one of the most effective ways to reduce waste generation and increase recycling available to government. More importantly, in these difficult times for state and municipal government in Vermont, PAYT pricing represents a logical way to reduce reliance on taxes to fund solid waste management, especially if combined with an EPR for funding the recycling system<sup>27</sup>. In essence, the combination of PAYT pricing for refuse, and EPR for recycling and management of hard-to-handle materials could result in a solid waste and materials management system for Vermont that does not rely at all on state or municipal taxes, but is entirely user funded.

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<sup>27</sup> PAYT programs can be designed to provide subsidies for low income Vermonters so that the program does not become a regressive tax.