

Recyclables in the Wrong Can

A Lost Opportunity to Benefit the Economy
and the Environment in Washington State



A special report prepared for
“Meeting Washington State’s Goals for Recycling”
a work session of the Senate Environmental Quality and Water
Resources Committee

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Foreword

The Washington State Recycling Association (WSRA),
through the volunteer efforts of several members,
has recently begun to reassess the
economic and environmental benefits of recycling.

The attached report was prepared to provide
a preliminary analysis of the numerous benefits of recycling.
A more complete analysis would have required much more time
and expense than possible through a voluntary effort,
but the attached report provides a good assessment of the
approximate impact that additional recycling could have.

Note that more information is available, and can
be provided upon request, to document the source and
derivation of the summary statements contained in this report.

Why is the focus of this report on “additional” recycling?
Because there appears to be a widespread belief
that recycling “has been accomplished” and many people have
now turned their attention to other problems. People in the
recycling industry have seen recycling’s success suffer dramatically
as a result, while at the same time it is clear to most of us
that recycling is far from having achieved its full potential.
The irony is that recycling should not be seen as competing
with other economic and environmental issues, but instead
should be pursued as a partial solution to these other problems.

The attached report was prepared by two consultants with a long history of involvement in
recycling and related issues:

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Additional information about subjects related to this report can also be gotten from WSRA’s
Executive Director, at (206) 244-0311.

Recyclables in the Wrong Can

Amount and Value of Disposed Recyclables

There is a huge amount of additional recycling that could be done. Evidence that our job is far from over is provided by numerous studies that have looked at the composition of garbage being disposed. These studies have been conducted on a statewide basis by the Department of Ecology and on a local level by several counties. These studies have repeatedly shown that one-third or more of garbage still consists of the “typical recyclables” (paper, plastic, glass and metal, see Table 1). If yard debris, construction and demolition wastes, and a few other materials are also considered, the amount of “garbage” that could easily be recycled exceeds 60 to 70 percent.

The table below uses averaged data from several counties’ waste composition studies¹ and the statewide waste disposal figure for 1997 (4,029,644 tons) to calculate the amount of typical recyclables that are still being thrown into a garbage can instead of a recycling bin. The value of these materials was then calculated using average market prices (from a survey of recycling companies throughout the state).

Table 1
Value of Disposed Recyclables
1997 Amounts / 1998 Values

	Disposed, tons per year¹	Typical Market Price²	Market Value, \$/year
Paper	897,650 tons	\$45	\$40,648,500
Plastic	336,420 tons	\$86	\$29,043,100
Metal	288,900 tons	\$144	\$41,462,120
Glass	<u>112,260 tons</u>	<u>\$24</u>	<u>\$2,655,070</u>
Total	1,635,200 tons ³	\$70	\$113,808,800

1. Tonnages are based on a statewide total amount of 4,029,644 tons of solid waste disposed in 1997, and averaged waste composition data from Clark, King, Lewis, Pierce, Spokane and Whitman Counties. Disposed tonnages were calculated using county data because the most recent study by Ecology is in a format that is difficult to apply in this manner.
2. The typical market prices shown are averaged responses from a variety of sources within Washington (14 respondents out of approximately 20 surveyed), and are intended to represent typical prices for the first half of 1998. Data was collected for specific materials within each category, the figures shown here are weighted averages.
3. Several important materials are not included in the figures shown in the above table, including yard debris, construction and demolition wastes (especially wood, concrete, asphalt and gypsum), textiles, oil, antifreeze, food waste, batteries, tires and carpeting.

Recycling as part of the Bigger Picture

The following provides a listing of many of the benefits of recycling, and is divided into “quantifiable” and “non-quantifiable” benefits. Quantifiable benefits are those that can be easily measured and/or backed up by scientific data. A recent development in the latter case, for example, is the data that has been developed by the US EPA showing that recycling reduces greenhouse gas emissions.

Quantifiable Benefits:

- Increased market revenues for local recycling programs.
- Reduced garbage collection, transfer, hauling and disposal costs.
- Additional jobs (*in the solid waste/recycling industry of course but also in the manufacturing sector through the use of recycled materials to make new products*).
- Indirect economic impacts (*ripple effects in local economies due to additional jobs and production of new products*).
- Conservation of local landfill space¹.
- Conservation of natural resources.
- Conservation of energy (*see Table 4*).
- Conservation of water (*see Table 4*).
- Reduced global warming as a result of reducing greenhouse gas emissions (*due to a reduction in greenhouse gases emitted when virgin materials are extracted, and due to the fact that landfills create significantly more greenhouse gases than recycling activities do, see Table 2*).
- Reduced public health impacts (*due to a reduction in hazardous pollutants emitted when virgin materials are extracted, processed and used to manufacture products, see Tables 2 and 4*).

Non-Quantifiable Benefits:

- Preserves habitat and watersheds (*preserves aesthetic qualities for residents and tourism, as well as benefits to wildlife*).
- Maintains ecosystem productivity for agriculture, fishing and forestry businesses.

1. *Conservation of landfill space is a significant issue primarily for those communities still using local landfills, where preservation of available space can be an important factor in forestalling substantial investments in either new facilities or in waste export systems. Note, however, that preservation of landfill capacity is not the over-riding issue that it once was for many communities, due to the construction of “mega-landfills” with large capacities. At the same time, however, communities exporting waste to privately owned mega-landfills are often able to more directly and clearly reduce their garbage costs by avoiding payment of disposal costs when waste is recycled.*

The Quantifiable Economic Benefits of Recycling

Table 2 provides a summary of the estimated value that additional recycling could provide. Much of these amounts would be accrued to residents, businesses and local governments in the State of Washington, but some of these benefits may also be accrued on a national or global scale.

Table 2
Economic Value of Additional Recycling

Benefit Category	Value to Washington ¹
Material Revenues: Capturing the recyclable materials remaining in the Washington State solid waste stream would generate a large amount of additional revenues.	\$113,808,800
Avoided Disposal Costs: Reducing the waste stream would reduce garbage collection and disposal costs (note that these disposal cost savings plus material revenues may sometimes not be enough to offset additional recycling collection and processing costs).	\$112,828,800 ²
Net Economic Impacts: Jobs and businesses are created when materials are recycled instead of landfilled.	\$126,900,000 to \$380,700,000 ³
Net Environmental Benefits; Reduction in greenhouse gases.	\$32,200,000
Reduced energy use.	Included ⁴
Net Public Health Benefits	\$249,700,000
Total Benefits	\$635,437,600 to \$889,237,600

1. *The above figures assume collection and recycling of 100% of the recyclables, which in reality would be impossible. In fact, collecting as much as 70 to 80% of the remaining recyclables would be doing very well.*
2. *Avoided disposal costs are based on a projected \$20/ton in collection cost savings and \$49/ton in disposal cost savings. Disposal cost savings were determined based on an average statewide disposal cost of \$58.84/ton (from the October 1998 issue of Solid Waste Digest), minus 16% for the estimated amount of administration and other overhead expenses (i.e., unavoidable expenses).*
3. *These figures only include those additional jobs that are created in the manufacturing sector which uses recycled materials to produce new products, and does not address the additional jobs that are created in the recycling collection industry. The range reflects the fact that manufacturing jobs are created in Washington State when recycled materials are used in producing new products in Washington rather than in other states where recycled materials may be shipped for manufacturing use. The lower end of the range assumes only 25% of the recycled materials are used in the state; the upper end assumes the use of 75% in the state.*
4. *Energy savings are reflected in prices paid for recycled materials (shown as Material Revenues in Tables 1 and 2). Pollution reductions from reduced energy use are reflected in reduced greenhouse gas and improved public health benefit estimates shown in Table 2.*

The Costs of Additional Recycling

Table 3 shows the costs that would be incurred by recycling additional materials. As with other tables in this report, the figures shown correlate to the costs of recycling 100% of the “typical” recyclables remaining in the waste stream, whereas in reality this high of a recovery level would not be possible.

Table 3
Economic Costs of Additional Recycling

Cost Category	Cost to Washington
Cost of Collecting, Processing and Marketing Additional Recyclable Materials	\$225,000,000 to \$275,000,000 ¹
Environmental and Public Health Costs	Included ²
Economic Impacts: Some jobs and businesses are lost when recycled materials replace virgin materials in manufacturing new products.	Included ³

1. *Additional recycling would cost between \$75 and \$175 per ton, including the costs of promoting recycling, collecting materials from both households and businesses, and processing and marketing materials for sale on recycling markets. Higher costs would be incurred for collecting materials from households, with lower costs for collecting from businesses.*
2. *The environmental and public health costs of additional recycling have already been deducted from the gross benefits of additional recycling to come up with the net environmental and public health benefits shown in Table 2.*
3. *Potential job and business losses associated with the reduced use of virgin materials in manufacturing products have already been deducted from gross job and business increases to come up with the Net Economic Impacts value shown in Table 2.*

Additional Quantifiable Environmental Benefits of Recycling

Table 4 shows the positive impacts of recycling on conserving resources and reducing pollution. Although some of these factors, such as reductions in the use of water and energy, could also be viewed as economic issues, all of these are summarized under the convenient title of “environmental” benefits. It should also be noted that the impacts shown in Table 4 have been partially quantified in Table 2, but additional work needs to be done to provide a more complete assessment of the economic, social and environmental value of these benefits.

Table 4
Environmental Benefits of Recycling
Reduction in Energy Usage and Pollution for using Recycled vs. Virgin Materials

Reduction of:	Aluminum	Steel	Paper	Glass
Energy Use	90 – 97%	47 – 74%	23 – 74%	4 – 32%
Air Pollution	95%	85%	74%	20%
Water Pollution	97%	76%	35%	NA
Mining Wastes	NA	97%	NA	80%
Water Use	NA	40%	58%	50%

NA = Not Available.

The Benefits of Recycling: A Local Success Story

The idea that recycling provides environmental and other benefits (in addition to material revenues and reduced garbage costs), and in some cases quite unexpected benefits, is illustrated by this recent press release:

Simpson Tacoma Kraft Shuts Down Its Oldest Recovery Boiler; Mill Will Reduce Odor

TACOMA, Wash.--(BUSINESS WIRE)--Jan. 13, 1999--Simpson Tacoma Kraft Co. today announced it has permanently shut down its number three recovery boiler, the oldest boiler at its Tacoma pulp and paper mill.

Since acquiring the pulp and paper mill in 1985, Simpson Tacoma Kraft has committed more than \$250 million in capital for ongoing production and environmental improvements.

Simpson completely shut down the recovery boiler in December 1998 when the mill reached a sustainable level of consumption of recycled fiber that no longer economically justified consuming raw wood in connection with its number three recovery boiler. When Simpson announced in 1994 that it would expand its use of recycled fiber, company officials said it would eventually lead to the shut down of its oldest boiler. After the recycle project was completed in 1996 and customers accepted linerboard products with higher recycle content, the mill raised its consumption of old corrugated containers.

"We are delighted to announce that Simpson Tacoma Kraft has permanently shut down Number Three Recovery Boiler. This means that the mill continues its progress in raising its environmental operating standards," said Don Johnson, plant manager.

The permanent shut down of the recovery boiler results in a 64 percent reduction in total suspended particulates and a 68 percent reduction in odor-causing sulfur compounds.

Simpson Tacoma Kraft Co. is a 1,200-tons-per-day pulp and paper mill in Tacoma, Wash., manufacturing bleached and natural kraft linerboard, shipping sack, specialty kraft papers and market pulp. Simpson Tacoma Kraft is a subsidiary of Seattle-based Simpson Investment Co.

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