

Chapter 18

WASTES TO WEALTH: ECONOMIC DEVELOPMENT

Background

The 21st Century economy is rich with opportunities for Clark County. The Solid Waste Advisory Committee has chosen to capitalize on these opportunities with a new chapter that builds on the strong economic contributions of our existing solid waste companies, while paving the way for new solid waste related businesses. To this end, we are working to help existing businesses to remain competitive, nurturing a conservation culture through the Clark County Green Business program, and laying the groundwork to recruit new companies to strengthen and further diversify the county's waste sector. This chapter calls for Clark County to drive strategic initiatives that strengthen the regional and global competitiveness of Clark County's waste industries and maintains a supportive business environment through public policy.

When collected with skill and care, and upgraded with quality in mind, discarded materials are a resource that can contribute to local revenue, job creation, business expansion, and the local economic base. On a per-ton basis, sorting and processing recyclables alone sustain 10 times more jobs than landfilling or incineration (per the *Institute for Self-Reliance*). Making new products from the old offers the largest economic pay-off in the recycling loop. New recycling-based manufacturers employ even more people and at higher wages than does sorting recyclables. Additionally reuse, recycling and composting can reduce significant amounts of resources and energy used in the manufacture, distribution, and sale of products to consumers.

- **Waste prevention/efficiency**, which is the ability to free up dollars historically spent on products that are later discarded or reused, for other investments.
- **Reuse**, which is sometimes an option for packaging (such as cardboard boxes) but is more often an option for products (such as equipment, clothing and other goods).
- **Recycling**, which often is a more practical solution for handling packaging (such as bottles and cans) than reuse, and is also a good option for many products (such as newspapers, metal appliances, batteries and wood).
- **Composting**, similar to recycling in the sense that it is the next best option for organic materials that cannot be reused.

This chapter outlines different initiatives that could potentially add to the local economy, create new jobs and shape Clark County's future waste management decisions. The decisions on which initiatives to undertake may be dependent on public-private partnerships or related local entrepreneurial ventures mining the urban waste stream.

Assessment of Conditions

Recycling Market Value of Landfilled Materials

As Table 18-1 shows, the market value for the recyclable materials still being trashed is over \$6 million annually. The net present value of \$6 million annually over a 10 or 20 year period is significant and could provide the impetus to make an investment to recover a greater value of resources. Another approach might be to pick the two or three most valuable materials and lay out a way to get more of that material recovered.

Table 18-1 Landfilled Amounts of Recyclable Materials

Curbside Recyclable Materials	Landfilled Amount (annual tons, 2012)	Market Value (2013)	
		Market Price (per ton)	Total Market Value
Newspaper	1,580	\$75-85	\$126,400
Cardboard	7,090*	\$100-120	\$780,000
Mixed Waste Paper	10,880	\$70-80	\$816,000
Milk Cartons, Other	440	\$0	\$0
PET Bottles	1,810	\$300-400	\$633,500
HDPE Bottles	1,090	\$300-400	\$385,000
Bottles 3-7	140	\$0	\$0
Tubs	530	\$0	\$0
Aluminum Cans	760	\$1,250-1,400	\$1,007,000
Tin Cans	1,380	\$150-200	\$241,500
Scrap Metal	10,500*	\$200	\$2,100,000
Glass Bottles	4,290	\$(-20)-0	\$-42,900
Total Curbside Materials	40,500		\$6,044,490

Note: The disposed amounts of cardboard and scrap metals have been adjusted for floor sorting by Waste Connections in 2012. Disposed amounts are annual tonnages for 2012.

Sources: Disposed amounts are from the 2012 Waste Stream Analysis for Clark County. Market prices were gathered from a variety of sources and are generally current as of late 2013.

It is important to note that Waste Connections, Inc. the contracted operator of the County's transfer stations is meeting its contractual requirements for recovering recyclables from the trash and that the value of commodities already removed from the generated waste stream are not included in the above listing. Changing behavior to keep recyclables out of trash cans and dumpsters is another key component to recovering some of the \$6 million in potential market value.

Current Solid Waste System Employment Levels

Less than 26% of county residents hold a 4-year degree (a widely used proxy variable for skill in the labor force). The waste sector offers benefits with respect to average compensation rates (over \$18 per hour) and required skill levels.

One of the challenges in the recovering economy concerns a mismatch in the available skill level of the labor force to the available employment opportunities. Much of this is a structural change, so many of the jobs lost will not return. There is then a substantial need among workers to secure stable employment that provides a pathway from part-time minimum wage jobs to full-time middle wage jobs with benefits. The waste and recycling sector could be an area where such jobs are generated, providing incremental skill level increase without the necessity of additional educational attainment.

As Table 18-2 shows, a significant number of Clark County jobs are already dependent on the solid waste system. Those 1,727 jobs contribute:

- \$190 million worth of economic activity for solid waste/recycling/waste prevention (reuse, repair and rental, but excluding car and home repairs) businesses.
- Companies involved in some aspect of the solid waste system in Clark County paid over \$52 million in wages in 2012. The average annual wage for the jobs in solid waste and recycling is \$38,266 or just 16% less than the county average wage of \$44,446.

Table 18-2 Economic Activity for the Current Solid Waste System

Activity	Number of Firms	Percent	Sales	Percent	Number of Employees	Percent
Reuse	92	23%	\$16,777	9%	388	22%
Rental	72	18%	\$29,935	16%	268	16%
Repair	193	49%	\$39,187	21%	537	31%
Manufacturing and Wholesale	14	4%	\$14,274	8%	119	7%
Collection	16	4%	\$59,281	31%	203	12%
Processing and Disposal	6	2%	\$30,558*	16%	212	12%
Totals	393		\$190,012		1,727	

Note: * This includes an estimated \$9.6 million in recovered commodity revenue from existing recovery programs. The Ecology data for 2012 recycling puts the County wide recovery figure (recycled – not including diverted materials) at 119,497 tons and we assumed an average \$80/ton amount for typical market value.

Sources: Dun & Bradstreet, November 2013, supplemented with data from the cities of Camas and Vancouver, Clark County and the WA Utilities Transportation Commission (WUTC).

Alternatives for Additional Employment

There are a number of available options for increasing the economic benefits that can be derived from the solid waste system. These job creating initiatives are reviewed in the pages that follow.

Expanded and New Markets for Recyclable Materials

The markets for recyclable materials are constantly undergoing changes in response to financial conditions, competition with other end-users, consumer demand, and other factors. A few highlights of planned and potential changes that could affect markets for Clark County recyclables include:

- Demand for recycled plastic could be increased by new approaches such as a bottle-to-bottle plant in Texas. Recycling plastic bottles back to bottles could help ensure supply and demand matches up better, but this has been a difficult process to implement to date. The new plant in Texas will consume about 1.6 billion bottles (40,000 tons) per year and will employ about 100 people. The plant will cost about \$40 million to construct.
- The recent opening of Glass to Glass, a new plant in Portland, Oregon, may help with glass recycling in the area. This plant is a joint venture of Owens-Illinois and eCullet.

Advances in technology could create benefits for local economies if properly applied. Some of these innovations could include:

- Small-scale machines that convert waste plastics into oil;
- Biochar production using wood or other organic wastes, which could sequester carbon (thus reducing greenhouse gases) and also serve as a beneficial additive to compost and soils;
- Converting recycled plastics into a material that could be used in 3D printers, for local production of a variety of products with zero wastes produced; and,
- Conditionally exempt vermicomposting operations to handle food scraps locally.

Diversion of Reusables at Transfer Stations

Reuse, which preserves the greatest value for the objects being handled, typically does “pay for itself,” although often by relying on participants to absorb at least part of the collection or drop-off costs (such as by having them bring the materials to a central collection point). A Clark County waste stream analysis estimates that up to 2.5 percent of the waste stream is reusable materials or approximately 5,000 tons per year.

This initiative builds on an educational exhibit called “Tossed and Found” which offers a glimpse into what people are disposing at the transfer station by displaying recovered items for the public to view at the popular Recycled Arts Festival. The exhibit has demonstrated the opportunity to divert high-value materials in the delivered waste stream to a better end use. “Rich” reuse loads will be identified and re-directed for sorting at a separate location with the transfer station site. A trained “reuse crew” will separate out qualifying reusables (items you find in a thrift store e.g. textiles, household goods, furniture, etc.) based on their potential for reuse and recovery of embedded economic value (tip fees will have been already paid on the materials processed in this area, so exclusively those items whose value exceed the costs of removal will be pulled).

Reusables will be weighed and transported to an end market e.g. SAVERS warehouse, Goodwill, St. Vincent DePaul, etc. Discussions are underway to run a pilot program to determine a reusable commodity rate to develop a business case by comparing revenue (savings from avoided landfill costs + reusable commodity sales) versus costs (labor and transport). By recovering reusables on a full time basis rather than just a sampling for the Recycled Arts Fair event, jobs could be created. A five percent recovery rate of reusables at the transfer stations would equate to 250 tons of material diverted from the landfill and marketed for reuse.

Recovery of Construction Materials at Transfer Stations

Diverting construction materials for reuse or recycling could be accomplished using Waste Connections staff, with the diverted goods then sold to a reuse store, or diversion could be created by allowing an employee of a private company to pull materials from the incoming waste stream. Either method should support at least three to four additional jobs in Clark County, these would be at a different site than the transfer station and would focus on processing, repairing, and/or marketing of these materials for reuse or recycling. A C&D sort line at West Van will increase capacity for this recovery. The degree to which the new line and modification to practices support increased recovery is likely related to the number of local jobs that could be created.



*House deconstruct materials
Source: City of Vancouver*

Carbon Fiber Recycling

Carbon fiber is in everything from desktops, chairs, automobiles to airplanes. The prevalent use of carbon fiber is a direct result of its increased stability and lower density over aluminum and steel. The issue is that recycled carbon fiber does not retain the material integrity of the original product. However as carbon fiber becomes the industry standard. Recycling these advanced composite materials at the point of manufacturing use (industrial scrap) and at the end of the product life is essential to both these companies and to many other manufactures working hard to employ these technologies.

Washington State former Governor Christine Gregoire was instrumental in securing a location for the BMW plant in Washington State and promoted a partnership between Boeing and the BMW Group. As part of its SGL Automotive Carbon Fibers LLC joint venture, the BMW Group has built a new, state-of-the-art carbon fiber plant in Moses Lake, Washington, together with the SGL Group.

Clark County could become a major player in research work, product design and manufacturing automation for recycling these advanced carbon fiber materials and creating sustainable production solutions. Working with CREDC, local business leaders like Christensen Shipyards and higher educational institutions like WSU-Vancouver and Clark College, Clark County could set forth a plan to pave the way for carbon fiber future development and jobs. Vancouver based 30 year-old yacht manufacturer Christensen Shipyards' has a new venture to diversify fiberglass composite materials beyond the marine industry. Renewable Energy Composite Solutions, (R.E.C.S.) was the resulting spin-off, focusing on small scale vertical-axis wind turbines, hydro power, and other highly-engineered applications.

The immediate question is how to recycle carbon fibers that are surplus during production, from material that isn't used or parts that are imperfect. The challenge is substantial, because the airline industry now recycles more than 90,000 tons of aircraft aluminum a year, and composites will gradually replace much of this aluminum in years to come. Researchers are just beginning to figure out how to separate carbon fibers from the resin matrix, and then align them well enough to make an efficient finished product. The West Coast is in a position to compete for hosting some of the start-up composites recycling companies as our region is closer to the center of manufacturing. A key will be to identify end products and even new industries that can be based on utilization of the reclaimed carbon fiber feedstocks that will eventually be produced. A Boeing goal has been set to reach 90 percent recycling by 2016.

Compost Facility

Building a compost facility in Clark County with an estimated 100,000 ton capacity could create 10 green jobs and supply a large volume of compost for local use. The number one determining factor in the success or failure of any composting facility is the location in relation to both feedstocks and demand for end product. A potential location is the Chelatchie Prairie rural center, as there is property there already zoned for industrial uses including a 152-acre former sawmill site which is located on the county's railroad.

There is a need in the Portland/Vancouver region for local processing for food waste. Currently 1,000 tons of food waste is collected in Clark County each year. An additional 20,000 tons of yard debris is collected by Clark County and the City of Vancouver although most of the material is reloaded to be composted outside the county. A local site could also allow Clark County to co-mingle food waste and yard

waste in existing yard waste carts a system that is currently being used or tested in other counties and cities throughout Washington State.

Compost is a valuable product that is currently being manufactured in Oregon from our local supplies. By keeping this product local many environmental benefits result including:

- Reduced need for fertilizers and less nitrogen run-off;
- Improved stormwater treatment; and,
- Increased food production.

Leichner Landfill Campus

Clark County owns the closed Leichner Landfill, and the Leichner Campus an adjacent parcel, formally known as the Koski property. The Leichner Campus is a 35-acre parcel which is relatively flat, contains no buried garbage, and is zoned for light-industrial development.

The County is developing a master plan to guide future redevelopment of the closed landfill and adjacent parcels. The County has also been awarded an Integrated Planning Grant (IPG) from the WDOE to evaluate another adjacent property currently owned by the Fleischer family.

The 9.5 acre Fleischer property is a vacant parcel that was previously used for agriculture and fertilizer processing. The site is known to be contaminated with polychlorinated biphenyl, or PCB. The IPG will allow the County and the owner to assess the extent of contamination, develop a cleanup action plan, and determine the cost to remediate the site. The IPG will also evaluate grant funding sources available to the County through WDOE for remediating the site. If it appears to be economically feasible, the County will evaluate the potential to acquire the property and utilize WDOE grants to remediate the site.

The near-term master planning effort focuses on redevelopment of the Leichner Campus and the potential for job creation. If the remediation of the Fleischer property is economically feasible, the IPG provides funding to include the Fleischer property in the overall Leichner Master Plan area. The long-term planning effort will examine the potential to redevelop the closed landfill for recreational uses and or a park.

Installation of a permanent compressed natural gas (CNG) fueling station for local government fleets and Waste Connections hauling company fleet. Waste Connections currently has a Clean Energy Mobile CNG station capable of fueling 12-15 vehicles (out of 106 vehicles in their fleet). With this sort of consolidation, a permanent CNG station could be justified to expand capacity to fuel Waste Connections, Public Works fleets and the general public.



Future Processing and Disposal Options

In Clark County, the current employment in the waste sector includes local management representatives of two landfills (Finley Buttes and Wasco County), employees of three transfer stations, and the jobs created by recycling companies whose primary activity is processing. Most of the jobs associated with landfilling waste are at the landfill, which in Clark County's case are not in the county. Plus landfilling creates relatively few jobs compared to recycling and other processing methods for waste, so any form of future waste processing in Clark County that results in less material going to the landfills would both create more jobs and could create jobs that are in the county. There are a number of interesting developments in this area that could potentially provide opportunities for managing our waste differently in a decade or two when technologies and economics make such approaches more feasible and disposal contracts are being reviewed, including:

Conversion technologies

The term "conversion technologies" is currently applied in several approaches to waste recovery, but in general is used to refer to thermal, biological and chemical processes that convert solid wastes into energy and other byproducts.

Mechanical/biological treatment (MBT) or Material Recovery and Biological Treatment (MRBT)

Mechanical/biological treatment (MBT) or Material Recovery and Biological Treatment (MRBT) are two different systems that employ a series of steps to process solid wastes, removing recyclables and composting organics. Both systems employ proven technologies that are arranged in a system that attempts to maximize the amount of materials that can be recovered or processed. In both systems, however, the resulting compost is not sold as a marketable material, but the composting is done to stabilize wastes prior to landfilling. This creates an additional expense which many would claim is unnecessary for landfills equipped with gas recovery. On the other hand, both systems would yield additional amounts of recyclable materials.

Biorefineries

Several initiatives are moving forward that would convert municipal solid waste (MSW) to liquid fuel or useful industrial chemicals. Enerkem, a Canadian company, has built a biorefinery in collaboration with the City of Edmonton. When fully operational, it will have an annual production capacity of 10 million gallons, made from 100,000 tons of the city's waste that the city would promise to provide for the next 25 years. These waste-digesting biorefineries are fundamentally different from standard trash-fired power plants, which have been the target of a number of lawsuits. Concerns center on particulate emissions and a combustion process that creates new nasty pollutants, such as dioxins. But in the case of the Enerkem model, the garbage is heated at low temperature in sealed vessels to gasify it, breaking down the molecules into carbon monoxide and hydrogen gas, which are then reassembled into other compounds using metal catalysts. The biorefinery process has attracted attention for its positive environmental features. The California Air Resources Board conducted a life-cycle assessment that showed that MSW-derived cellulosic ethanol is potentially carbon neutral. What's more, the same thermochemical process could be used not only to produce ethanol, but also to yield substitutes for petrochemicals used in manufacturing.

Like any emerging industry there will be breakthroughs and dead-ends. Although somewhat promising, many of these processes are still highly experimental and not ready for large-scale applications. It would not be prudent for Clark County to invest in these technologies anytime soon, but this field should be monitored for possible implementation at a future date and implications for jobs and regional economic are important factors for consideration.

Policy Tools

As increasing the amount of materials recycled creates more jobs and market revenues, Clark County and other agencies could take a number of steps to encourage various waste diversion activities and recycling operations in our local, regional or statewide areas. Steps that will promote the viability of the County's manufacturing and industrial base may include:

- Tax Incentives** Tax incentives could include the suspension or reduction of property or other taxes, initially or over a longer term for those selected investors or operators who pursue waste and recyclables businesses that afford local economic benefits. This approach was a contributing factor for the Cascades mill expansion in St. Helens. Oregon offered tax abatement for five years because Cascades agreed to pay their new workers' wages and benefits that are at least 50% over the median wage in Columbia County.
- Grants** Grants can encourage specific activities or offer targeted support to reduce specific types of expenses.
- Zoning and Special Zones** Zoning can be used to allow manufacturing in specific areas of the county, or at least to avoid barring specific operations from areas that might work well for a company. Special zones, such as "innovation zones," "enterprise zones," or other zones, can be established to clearly identify areas where tax breaks or other incentives are provided.

Materials Mandates

As increasing the amount of materials recycled creates more jobs and market revenues, Clark County and other agencies could take a number of steps to encourage waste diversion activities and recycling operations, including:

- Container Deposits** Container deposits, or bottle bills, are generally enacted on a statewide scale, not countywide, but Clark County's proximity to Oregon which has one of these laws raises an interesting possibility for the county to enact a law similar to Oregon. If nothing else, this would increase the county's apparent recycling rate by eliminating the "leakage" that occurs now as people take deposit containers from Clark County to Portland area redemption locations.
- Procurement Mandates** Procurement requirements could increase the demand for recycled products produced locally or regionally and hence the value of recyclables, potentially leading to increased collections and jobs.
- Recycle Content Requirements** As with procurement mandates, requirements that specific products contain a minimum amount of recycled materials could lead to increased demand and jobs.
- Disposal Bans** Disposal bans could be another method for increasing the amount of recyclables collected. Some municipalities have banned plastic grocery sacs which could include a revenue stream from the purchase of alternative bags e.g. paper or reusables.
- Product Stewardship** Product stewardship programs can be implemented in such a way to create a separate collection, processing and marketing system for products that are currently handled through disposal, thus creating a range of new jobs. As with some of the above options, however, product stewardship programs are generally not enacted on a county level, but more typically on a statewide level.

Recommendations

All recommendations in this chapter are designed to enhance the recovery of waste from being landfilled. The Chapter documents that the “business” of recovering waste generates more jobs than landfilling waste.

1. **Convene a task group with other government departments and other regional agencies** to focus on developing green manufacturing jobs; and eco-business parks related to the solid waste industry. This will include various planning incentives such as enterprise zones. SWAC will play an active role in this planning, review and implementation. (18-5; 18-6)
2. **Conduct feasibility study(s), including a cost/benefit analysis, for a local organic processing facility** to allow recovery of food waste (in addition to yard debris) from the waste stream. If feasible, continue with planning and implementation. (18-5)
3. **Prepare a master plan** focusing on redevelopment and potential job creation potential of the Leichner Landfill Campus. (18-6)
4. **Evaluate the Fleischer property** to determine if it is economically feasible to remediate the property and include it in the overall Leichner Master Plan Area. (18-6)
5. **Develop a funding and financing plan** to determine if it is economically feasible for the County to acquire and remediate the Fleischer property utilizing County funds and WDOE grants. (18-6)
6. **Implement a pilot program at a transfer station** that will recover “household” reusable items. Explore partnerships with non-profit organizations. (18-4)
7. **Track expanded and new** market opportunities. (18-8)

End of Chapter 18

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