

Closing the Loop in Maryland: Recycling-Based Businesses Create Skilled Jobs, Divert Waste, and Capture Local Revenue

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Introduction

In 1995, the Institute for Local Self-Reliance (ILSR) published a report outlining the local economic opportunities created by improving recycling infrastructure and diverting waste in the Baltimore, DC and Richmond Mid-Atlantic region. The report, *Recycling Means Business*, found that recovering materials locally creates more jobs and requires less capital investment than disposal via landfilling or incineration. It recommended specific initiatives to maximize recycling-based economic development under a “closing the loop locally” framework. Recommended strategies encompassed instituting pay-as-you-throw trash collection fees, encouraging commodity reuse and repair, minimizing waste incineration, enlisting economic development agencies in recycling planning, offering incentives to recycling-based enterprises, and working with industrial park developers to attract such enterprises.¹ Since that time, Maryland’s recycling rate has increased but little attention has been paid to the flow of materials and the opportunity to link materials recovery to in-state jobs and new business development.

To update this research, in the spring of 2013 ILSR sought to survey recycling businesses in Maryland in order to track the number of jobs associated with material recovery activities today. A web-based survey was sent to 80 businesses in April. Of these, ILSR received only 4 responses. Each of these businesses represented a different recovery activity — reuse, processing, hauling, and a public landfill. This low and varied response rate made drawing any conclusions regarding job creation difficult and potentially highly inaccurate. For this reason, follow-up phone calls were made throughout May and June specifically focusing on businesses that manufacture an end-use product using recycled content. The goal of these conversations was to gather more accurate job data as well as information on the current state of local material recovery and the flow of those materials afterward. Table 1 provides a snapshot of recycling by county based on 2010 figures from the Maryland Department of the Environment (MDE), and includes the number of processing, manufacturing, composting, and reuse facilities estimated by ILSR.

The 1988 Maryland Recycling Act (MRA) requires all Maryland jurisdictions to recycle at least 15% of their waste, and at least 20% if they have populations over 150,000.² In 2011, Maryland reported a statewide recycling rate of 45%, recycling

Table 1: Waste Handled in Maryland by County, CY 2010

County	MRA Rate, % ^a	Tons Recycled MRA ^b	Tons Composted	Tons Recycled Non-MRA	Tons Disposed	# of Proc.	# of Mfg	# of Comp.	# of Reuse
Allegany	25.2	15,931	6,061	493,224	88,488	1	-	-	1
Anne Arundel	44.1	183,025	96,354	217,303	535,107	8	1	3	6
Baltimore City*	27.0	101,247	4,234	34,240	630,408	27	4	3	15
Baltimore*	41.0	253,280	97,825	857,377	1,001,637	8	1	5	3
Calvert	26.1	15,189	1,275	26,914	83,440	2	1	1	-
Carroll	41.2	35,736	37,359	183,436	132,643	4	2	3	-
Cecil	45.9	20,839	49,701	41,028	106,768	1	-	2	2
Charles	39.0	22,733	29,842	361,219	134,847	4	-	2	-
Dorchester	19.0	7,875	1,126	7,161	53,810	1	-	-	-
Frederick	44.3	80,249	27,194	45,963	194,436	4	-	2	3
Garrett	45.2	9,195	9,048	7,673	36,144	1	-	-	-
Harford*	56.8	73,612	58,542	17,924	156,537	3	1	5	1
Howard	45.9	137,345	79,602	144,143	368,295	8	1	1	5
Mid-Shore ^c	50.3	94,990	12,061	46,988	134,867	5	1	3	4
Montgomery*	47.2	284,093	174,569	70,940	802,676	8	-	3	6
Prince George's	40.4	261,990	77,410	454,101	726,380	13	1	1	8
Somerset	18.4	4,051	6	13,463	25,528	1	-	-	-
St. Mary's	36.6	24,563	7,478	18,967	79,030	-	-	-	-
Washington	42.3	61,855	1,095	37,810	111,573	6	1	-	2
Wicomico	18.9	19,701	2,872	4,945	102,254	3	-	2	-
Worcester	22.9	7,353	12,585	30,654	93,467	-	-	-	-

a: MRA Recycling Rates taken from Maryland Department of the Environment

b: Excluding Compostables and Incinerator Ash.

c: Mid-Shore includes Caroline, Kent, Queen Anne's, and Talbot counties.

* = jurisdictions that have active incinerators.

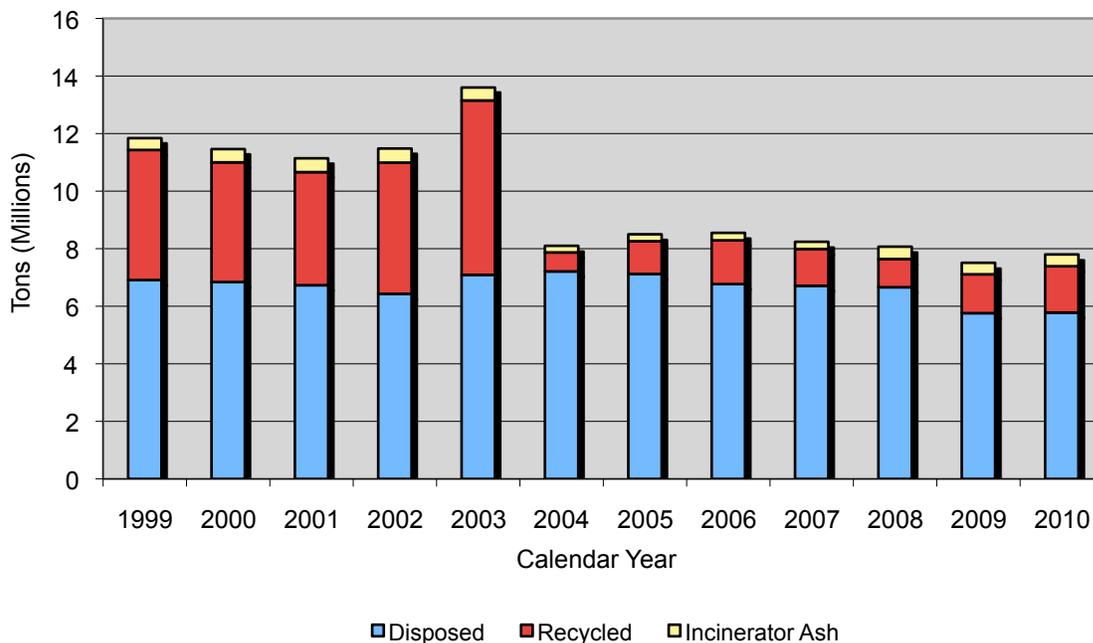
Source: MDE Maryland Solid Waste Management and Diversion Report 2013

just over 3 million tons of MRA materials — compostables, glass, metals, paper, plastics, and miscellaneous recyclables.³ However, the state’s reported recycling level includes 399,380 tons of incinerator ash (representing 13% of all MRA tonnage reported recycled). ILSR does not believe incinerator ash should be counted as recycled. Excluding incinerator ash, Maryland’s 2011 MRA recycling rate drops to 39%.⁴

In addition to the MRA materials, nearly 4 million tons of non-MRA materials were reported recycled, including: antifreeze, asphalt/concrete, coal ash, construction/demolition debris, land-clearing debris, scrap automobiles, scrap metal, sewage sludge, slag, soils, and waste oil.⁵ Adding 3.7% for the promotion of source reduction activities (such as reuse strategies and backyard composting), Maryland reported a 48.9% waste diversion rate (WDR). This exceeds the voluntary 40% WDR goal set by the state in 2000, but, again, the state’s reported recycling levels count incinerator ash from incinerator disposal facilities as recycled.

While the state’s recycling rate has consistently increased since the late 1980s, the rate of increase has slowed in recent years. With 2.10 million tons landfilled, 1.38 million tons incinerated, and another 2.57 million tons exported out of state for disposal,⁶ there is ample opportunity to divert a greater percentage of Maryland’s generated waste from disposal. Chart 1⁷ demonstrates that 10 years after the passage of the 1988 Recycling Act, the absolute tonnage of waste recycled was roughly 5 million tons through 2003. After 2003, however, the tonnage of recycled material dropped significantly, remaining closer to 1 million tons each year through 2010. Throughout this timeframe, the absolute tonnage of waste disposed in Maryland stayed relatively constant at roughly 6-7 million tons landfilled, incinerator, or exported.

Chart 1: Waste Managed in Maryland (Millions of Tons) 1999-2010



Recycling Creates Jobs

Reuse, recycling, and composting offer economic development opportunities as well as environmental protection and resource conservation. When collected with skill and care, and upgraded with quality in mind, discarded materials are a local resource that can contribute to local revenue, job creation, business expansion, and the local economic tax base.

For almost four decades, ILSR has been documenting how communities can increase local capacity and stimulate economic development through the efficient use and reuse of local resources. Our extensive research in the mid-1990s demonstrated that on a per-ton basis, sorting and processing recyclables alone sustain 10 times more jobs than landfilling or incineration.⁸ Waste disposal is not labor intensive due to the capacity of capital-intensive disposal equipment to handle large tonnages with few employees. In contrast, recycling operations tend to require more labor-intensive activities that involve a greater number of skilled, trained workers. Our work highlighted, however, that refurbishing products for reuse and making new products from the old offer the largest economic pay-off in the recycling loop. See Table 2. New recycling-based manufacturers employ even more people and at higher wages than does sorting recyclables. We found that some recycling-based paper mills and plastic product manufacturers, for instance, employ on a per-ton basis 60 times more workers than do landfills.

According to Giuntini & Gaudette (2003), remanufacturing “is the ultimate form of recycling. It conserves not only the raw material content but also much of the value added during the processes required to manufacture new products. And it may represent the largest untapped opportunity for improving productivity in American industry.”⁹ It is a far more dynamic process that requires more initial training and a broader skill set of its employees. Businesses that incorporate remanufacturing “into their strategic plans...can reap a stable source of long-term growth. The workforce benefits from additional training and a more varied workplace.”¹⁰

Value is added to discarded materials as a result of cleaning, sorting, and baling. Manufacturing with locally collected discards adds even more value by producing finished goods. For example, wastepaper may sell for \$100 per ton, but new paper may sell for \$1,000 per ton. Each recycling step a community takes locally means more jobs,

Table 2: Job creation from reuse and recycling v. disposal

Type of Operation	Jobs per 10,000 TPY
Product Reuse	
Computer Reuse	296
Textile Reclamation	85
Misc. Durables Reuse	62
Wooden Pallet Repair	28
Recycling-based Manufacturers	25
Paper Mills	18
Glass Product Manufacturers	26
Plastic Product Manufacturers	93
Multi-Material Processors	10
Composting	4
Landfill and Incinerator	1

TPY = tons per year

Note: Figures are based on interviews with selected facilities around the U.S.

Source: Brenda Platt and Neil Seldman, *Wasting and Recycling in the United States 2000* (GrassRoots Recycling Network, Athens, Georgia: 2000), p. 27.

more business expenditures on supplies and services, and more money circulating in the local economy through spending and tax payments. Table 3 lists examples of the many new products that can be made from recovered materials.

Table 3: Examples of Products Made from Recovered Discards

Glass bottles aggregate art glass fiberglass insulation flat glass foam glass glass-bonded tile pressed glass road sub-base wastewater filter media	Paper newsprint printing & writing paper tissue liner board paperboard fiberboard corrugating medium bag paper cellulose insulation packaging fill molded pulp roofing felt tube stock writing pencils animal bedding	Plastics building insulation carpeting bottles egg cartons fiber stuffing floor tiles loose fill packaging lumber traffic control cones battery cases	Rubber asphalt additive flooring gaskets highway crash barriers playground equipment artificial reefs erosion control dock bumpers die cut machine parts rubber railroad crossing shoe soles
Metals automobile parts cans I-beams sheet siding		Wood furniture products particle board refurbished pallets wood/plastic compound concrete aggregate animal bedding mulch	Yard Trimmings/Food Waste compost mulch animal bedding

Product reuse is even more job-intensive than recycling. It is a knowledge-based industry, with a premium placed on accurate sorting and pricing, and good inventory management. Reuse operations employ more people per ton than manufacturing enterprises.

A 2011 publication by the Tellus Institute supports the link between increased recycling and jobs. It found that recycling 75% of the nation's waste could create 1.5 million jobs by the year 2030 and support economically strong communities.¹¹ It also confirmed ILSR's work that processing (such as sorting and baling materials for end use manufacturers) accounts for fewer, less skilled jobs than reuse and manufacturing.¹² Processing recyclable materials creates about 2 jobs per 1000 tons (twenty times landfilling or incineration), manufacturing creates anywhere from 2.5 to 17.6 jobs per 1000 tons depending on the type of material.¹³ The Tellus Institute concluded that these jobs tend to be more highly skilled, require greater levels of training, and garner higher wages than at processing/materials recovery facilities, landfills, or incinerators.

ILSR's 2013 report, *Pay Dirt: Composting in Maryland to Create Jobs, Reduce Waste, and Protect the Bay*, demonstrates that ability of in-state production (in this case, compost) to create jobs. Key findings of that report include:¹⁴

- Composting (including mulching and natural wood waste recycling) operations in Maryland already sustain more total jobs than the state's three trash incinerators, which handle almost twice as much tonnage.

- Jobs are sustained in each stage of the organics recovery cycle: manufacturing compost as well as using compost.
- On a per-ton basis, composting in Maryland employs two times more workers than landfilling, and four times more than the state's trash incinerators.
- On a per-dollar-capital investment basis, for every \$10 million invested, composting facilities in Maryland support twice as many jobs as landfills and 17 more jobs than incinerators.
- Wages at composting facilities typically range from \$16 to \$20 per hour.
- In addition to manufacturing compost, *using* compost in “green infrastructure” and for stormwater and sediment control creates even more jobs. Green infrastructure represents low-impact development such as rain gardens, green roofs, bioswales, vegetated retaining walls, and compost blankets on steep highway embankments to control soil erosion.
- An entire new industry of contractors who use compost and compost-based products for green infrastructure has emerged, presenting an opportunity to establish a new made-in-America industrial sector.
- Utilizing 10,000 tons of finished compost annually in green infrastructure can sustain one new business. For every 10,000 tons of compost used annually by these businesses, 18 full-time equivalent job can be sustained.
- For every 1 million tons of organic material composted, followed by local use of the resulting compost in green infrastructure, almost 1,400 new full-time equivalent jobs could potentially be supported. These 1,400 jobs could pay wages from \$23 million to \$57 million each year.
- Composting and compost use represent place-based industries that cannot be outsourced abroad.
- Smaller composting facilities have a higher job-to-ton ratio. In Maryland, on a per-ton basis, small-scale composting facilities employ six times the number of jobs as landfills and eleven times more than incinerators.
- Several small-scale food scrap composting operations have opened in Maryland the last three years, demonstrating the viability of locally-based systems: ECO City Farms, an urban farm in Edmonston; Chesapeake Compost Works, a private enterprise in Curtis Bay, Baltimore; and a Howard County government site to process material from a residential pilot.
- Communities embracing a decentralized and diverse organics recovery infrastructure –one that first prioritizes food rescue, backyard composting, onsite institutional systems, community composting, and urban and rural on-farm composting before the development of centralized regional facilities – will be more resilient and will better reap the economic and environmental benefits that organics recovery has to offer.

By increasing its recycling rate to 75%, Maryland could undoubtedly increase the number of reuse, recycling, and composting related jobs and businesses within its borders. While all recycling is diverting waste from landfills and incinerators, not all recycling activities are considered equal in terms of the economic benefits they provide. Thus the number and type of potential jobs created in Maryland depends on whether or not recovered materials are refurbished and manufactured into new products within the state.

Remanufacturing in Maryland

In the spring of 2013, ILSR sought to survey recycling businesses in Maryland in order to gain updated data. The underlying goal was to get a sense of the current state of recycling-based manufacturing. Of the 80 surveys originally sent out, only 4 were returned. Due to this low response rate, additional qualitative and quantitative data was gathered throughout May and June through phone conversations with business owners, plant managers, administrators, and government officials.

These conversations revealed that much of the recyclable materials generated in Maryland leave the state after the processing stage and are manufactured by companies in other states. Few of the Maryland-based recycling companies contacted by ILSR represent manufacturing operations. The vast majority are processors or material recovery facilities. In fact, as is demonstrated in Table 4, out of 215 recycling-related businesses, half (108) simply process materials that then flow to another facility or location, typically to companies in Pennsylvania, Delaware, and Virginia.¹⁵ For example, Kline Paper Mill, one of the four survey respondents, generates 100% of its revenue from selling the paper it processes to recyclers outside of Maryland.¹⁶ Fifty-six of the businesses are predominantly reuse operations. Community Forklift sells surplus and salvaged building materials, currently generating only 60 percent of its revenue from inside Maryland.

According to Dave Mrgich, Chief, Waste Diversion Division of the MD Department of the Environment (MDE), the type of business — e.g., processor,

manufacturer, hauler, broker, etc. — is not something the government tracks. There is no license required for remanufacturing operations, nor is there any recycling-specific permitting involved. Instead, businesses with manufacturing processes are required to apply for general environmental permits. Mr. Mrgich mentioned that, in theory, the lack of a recycling specific permit would actually make it easier for businesses to remanufacture using recycled materials, as a recycling permit would simply impose another bureaucratic process for

Table 4: Maryland Waste Handling Businesses by Type

Type of Facility	Number
MSW Incinerators	3
Landfills (MSW/C&D)	29
Composting/Natural Wood Waste Recycling	36
Remanufacturing	14
Processor/MRF	108
Reuse	56

C&D = construction & demolition
MRF = materials recovery facility
MSW = municipal solid waste

Source: Institute for Local Self-Reliance, 2013.

small businesses to endure. However, a lack of tracking makes identifying manufacturers that use recycled materials or recyclers that manufacture products quite difficult.¹⁷ Mr. Mrgich's impression is that not much manufacturing of products is occurring in-state. Many facilities that used to, such as a paper facility outside of Frederick or Baltimore Scrap Corporation, are no longer around. Much of the glass generated in Maryland travels to a plant in Pittsburgh.¹⁸

MDE does maintain an online recycling market directory,¹⁹ which ILSR used to help generate a contact list for disseminating the survey and organizing phone interviews. The directory seemed to confirm Mr. Mrgich's impression. Nearly all of the businesses that explicitly identify their operations as manufacturing-based in the MDE directory are located in Pennsylvania, Virginia, West Virginia, and Delaware. ILSR called all Maryland businesses that handle glass, plastics, paper, metals, and construction debris that did not voluntarily identify as haulers, brokers, material recovery facilities, or transfer stations. The vast majority of these businesses turn out to be processors/material recovery facilities with no manufacturing. A handful deal only with compostables, which ILSR recently discussed in another report.²⁰ Many — about one in ten — had phone numbers listed that are currently out of service or disconnected. Narrowing down the list through a combination of phone conversations and online research, resulted in 13 businesses (6% of the 215 Maryland recycling businesses) that manufacture products using recycled material. See Table 5.

[For breakdowns of other waste management businesses in Maryland, see appendices.]

Table 5: Maryland Remanufacturing Businesses

Business Name	Product	City	County
Berry Plastics	Plastics	Hanover	Anne Arundel
Key Recycling Center	Concrete, Asphalt, Plastics	Baltimore	Baltimore City
Re-Form	Office Furniture	Baltimore	Baltimore City
United States Gypsum Company	Multiple Materials	Baltimore	Baltimore City
Lafarge Mid-Atlantic	Steel	Towson	Baltimore
Victor Stanley, Inc.	Steel, Plastics	Dunkirk	Calvert
Asphalt Roof Recycling Center	Roofing Shingles	Mt. Airy	Carroll
CJ Miller/Miller Asphalt Products	Concrete, Asphalt	Finksburg	Carroll
Constar Plastics, Inc.	Plastics	Havre de Grace	Harford
C.R. Daniels, Inc.	Plastics	Ellicott City	Howard
CreaFill Fibers Corporation	Paper	Chestertown	Kent (Mid-Shore)
Design Recycle, Inc.	Rubber, Plastics	Upper Marlboro	Prince George's
Maryland Paper Company	Paper	Williamsport	Washington

Source: Institute for Local Self-Reliance, 2013.

Maryland Remanufacturers

Through phone calls and internet research, ILSR identified the 13 businesses in Table 5 as having active manufacturing operations using recycled content. In June 2013, ILSR contacted each of these businesses by phone to participate in its recycling study. Of the 13, 8 discussed their activities and operations with us. The intent of these conversations was to gather information on the following: the amount of recycled material (tons) handled, the type of materials accepted, the products manufactured, the source of the recycled materials, where their products are sold, and the number of full-time equivalent jobs associated with their activities. Many of the participating businesses were not able to provide data in every area, but their responses shed some light on the potential for growing an important aspect of the local recycling industry. ILSR's conversations with the 8 businesses are summarized below.

Victor Stanley, Dunkirk, Calvert County — Steel and Plastics

Victor Stanley, Inc. in Dunkirk has been in business since 1962. Manufacturing multiple lines of outdoor equipment — e.g., benches, tables, seats, litter receptacles, recycling stations, ash urns, planters, and tree guards — Victory Stanley predominantly uses recycled material in making its products. The primary raw material for its products is steel, most of which the company imports from Virginia. All steel used is 98% post-consumer and post-industrial materials. The plastics used are over 90% recycled content. The company “extrudes 100% of its recycled plastic slats in-house. The primary raw material used in this process is recycled HDPE [High Density Polyethylene] resin.”²¹ With a total of 150 full-time equivalent (FTE) positions in both the offices and factories, close to 100 of these are skilled manufacturing jobs, including: welding, steel fabrication, powder coating, caulking, and woodworking. While Victor Stanley's representative was unable to provide information on the tonnage of recycled materials handled annually in their operations, every stage of the manufacturing process is handled in-house.²²

United States Gypsum Company, Baltimore — Fiberboard, Wallboard, Ceiling, and other Building Materials

Another predominant remanufacturing company similar to Victor Stanley is United States Gypsum Company (USG). A Chicago-based multi-national corporation, USG has manufacturing plants all over the world. The Baltimore facility manufactures wallboard, joint compounds, and cement board, though not exclusively from recycled materials. The true wood panels are required to be over 50% recycled content, and two lines of their fiber board — SUCEROCK and FIBEROCK — are manufactured from 95% recycled material.²³

Re-Form, Baltimore — Office Furnishings

Re-Form, also in Baltimore, has been in business since 1986, buying furniture that has been left behind or discarded to remanufacture and sell. At times it is reuse, simply selling a used item in good condition. However, much of Re-Form's business is in remanufacturing two lines of office furniture: Herman Miller and Hayworth. The 48 skilled employees do woodworking, upholstering, and other repairs in the four remanufacturing shops. Often they will use post-consumer recycled fabrics and materials when available, but mostly use new materials to refinish and rebuild the furniture, making the end-use products less than 100% recycled content. However, the vast majority of the finished piece is the original item that was restored. The owner, George Fisk, was unable to assess the tons of material handled on a yearly basis, though discussed his recent contract with the International Monetary Fund (IMF) to refinish all of its office furniture as it moves buildings instead of disposing and buying new. He would like to expand his business and cites new furniture manufacturers and dealers as a primary obstacle. New dealers, he says, deliberately make new products more difficult to remanufacture and the industry has become less standardized.²⁴

C.J. Miller/Miller Asphalt Company, Finksburg, Carroll County — Recycled Asphalt Product (RAP)

Companies like C.J. Miller in Finksburg are not uncommon in Maryland and fall in an ambiguous category between processor and manufacturer. The types of jobs generated are not consistent with those discussed by Giuntini & Gaudette (2003) of the remanufacturing industry, and the end-use product involves the processing of materials into smaller sizes rather than the making of a new item. What differentiates C.J. Miller's operations from similar construction reclamation companies such as Clean Earth of Maryland, Stonetech, or Patuxent Materials is that, beyond simply grinding materials for bulk resale, C.J. Miller creates recycled asphalt pavement (RAP). Concrete from demolition sites is added to new blacktop to create asphalt mixes with on average 15% recycled content. The source material comes from construction projects around the region, but 100% of C.J. Miller's revenue is in-state. The company produces about 200,000 tons of recycling-based product a year with roughly 30 full-time equivalent employees dedicated to asphalt. This translates to roughly 0.4 jobs per 1000 tons of recycled material. In addition, the company is constantly looking to expand its operations, though consistently finds regulations and financing to be an impediment. Just getting through the preliminary stages has gotten so far out of hand that it keeps many businesses from expanding.²⁵

Asphalt Roof Recycling Center (ARRC), Mt. Airy, Carroll County — Recycled Asphalt Additive

Asphalt Roof Recycling Center's (ARRC) current operations consist of recovering roofing shingles, grinding the material, and selling the ground shingles to asphalt plants. In operation for the past 16 years in Mt. Airy, ARP processes 8,000 to 10,000 tons of material each year with 2 full-time equivalent employees. Nearly 100% of the source

material and revenue comes from within Maryland, primarily Mt. Airy, western Baltimore County, Frederick, Westminster, Rockville, and Gaithersburg. Currently, ARRC is a recovery and processing facility, but the owner hopes to expand to also manufacturing on-site. This expansion dream has consistently come up short, running into regulatory and financing difficulties. The owner mentioned he was tired of wasting his time trying to convince officials to include shingles as an MRA listed material or convince the state highway department to approve his recycled mix for government infrastructure projects. State highway projects would be great for his business, but for the time being he is limited to selling to private contractors. The manufacturing operation he hopes to someday create would mean 6 new local jobs.²⁶

Maryland Paper Company, Williamsport, Washington County — Paper Products

Maryland Paper Company built its first factory in Williamsport in 1989 and now has factories in Alabama and California as well. The facility has 70 employees, all in manufacturing. The jobs are primarily skilled labor, engineering, and management. Maryland Paper offers its personnel training and education opportunities, believing it important to have skilled employees. Source materials come from the Atlantic Seaboard region, but the company ships its final products nationwide.²⁷ The owner hopes to continue expanding his businesses, but sees the market as a major obstacle. There is a lack of consumer demand as well as a disincentive for others to build up the industry due to too many regulations, 80% of which, he argues, are unnecessary. In addition, the costs of operations, especially source material and shipping, are prohibitively high.²⁸

CreaFill Fibers Corporation, Chestertown, Kent County (Mid-Shore) — Paper Products

CreaFill Fibers in Chestertown uses reclaimed paper as part of its manufacturing process. It has two separate lines: one is 100% reclaimed materials, the other is natural pulp. Its source material comes from individual drop-off or is purchased from various brokers, and roughly 40% of sales is from reclaimed materials. Products are sold worldwide and approximately 10% of sales occur within Maryland. With 35 employees, every one is somehow tied to manufacturing through quality control, maintenance, production, client services, warehouse, etc., 60% of which are skilled positions.²⁹

Design Recycle, Inc., Upper Marlboro, Prince George's County — Rubber Landscaping and Building Materials

Design Recycle Inc. (DRI) in Upper Marlboro was started by James Ingraham in 1986. DRI is "a Maryland environmental company established to design build and operate green product manufacturing and energy conservation products."³⁰ Mr. Ingraham got his start working with a county vocational training program that taught incarcerated individuals in restoration, refinishing, reupholstering, etc., with the dual aim of putting used goods back into circulation and providing inmates with valuable skills. Some examples of the participants' products were computer tables for county offices and manufactured modular classrooms used for student overflow. When this program

was disbanded, Mr. Ingraham started Design Recycle to continue research and development into repurposing and remanufacturing materials.³¹ DRI began making vineyard posts and other composites for outdoor agricultural use using 100% recycled plastics. The company also made landscape timber by chipping discarded car tires into various sizes and mixing them with urethane latex as a binding agent.³²

Design Recycle continued to invest in R&D on recycled building materials, using recycled rubber to create a lightweight concrete mix for building construction. Recently, Mr. Ingraham has taken a break from product development and is in the process of establishing the Global Green Technology Park (GGTP) in Upper Marlboro. He envisions the business park as an incubator program for emerging green companies hoping to manufacture green products. From investor funding, he was able to acquire an existing 150,000 square foot building (100,000 square feet of manufacturing space and 50,000 square feet of two-story office space) on 55 acres that already includes some of the required equipment such as cranes for heavy materials. The largest obstacle is accessing the necessary financing to get the project off the ground. Many companies have expressed interest in moving into the new park but have been unable to move since the process has stalled from lack of funding.

Projections from the proposal estimate that the GGTP “will create an initial economic impact in the Washington D.C. Metropolitan Area with nearly 1,200 new jobs while at the same time causing millions of US dollars to circulate in the regional economy.”³³ Not only will the project reportedly contribute to significant reductions in waste materials at landfills, it will utilize vacant land, will include naturally grown vegetables, and host training programs in manufacturing, marketing, and business.³⁴

Conclusion

Businesses such as the select few that participated in ILSR’s study offer great opportunity for growing Maryland’s economy locally. They account for dozens of skilled, local jobs by turning discarded materials into usable products. See Table 6. The majority of participants employ over 30 full-time equivalent positions. The Global Green Technology Park — as a plan to house multiple manufacturing companies in one site — could equate to over 1000 new jobs.

A goal to maximize the in-state recovery, processing, and reuse or remanufacture — i.e., closing the loop locally — would be a worthwhile goal for Maryland. The state has made significant improvements in the past two decades towards greater recycling infrastructure. However, the current lack of local manufacturing from recycled content is further evidence that much of the material leaves the state, creating skilled jobs and

Table 6: Jobs at Select Remanufacturers

Business Name	Total Full-Time Equivalent Employees
Victor Stanley	150
United States Gypsum Company	-
Re-Form	48
C.J. Miller	30
Asphalt Roof Recycling Center	2
Maryland Paper Company	70
CreaFill Fibers	35
Design Recycle	-

Source: Institute for Local Self-Reliance, 2013.

generating revenue elsewhere. Supporting small businesses that manufacture end-use products from 50-100% post-consumer and/or post-industrial recycled materials will increase the amount of waste diverted from landfilling or incineration, create a skilled labor force, and generate greater local revenue.

One way to support a greater remanufacturing industry is to implement a system of identifying and tracking specific recycling activities. While Maryland currently keeps a general directory of businesses that handle recycled material, keeping data on which stage(s) of the chain — e.g. recovery, hauling, processing, reuse, manufacturing — these businesses represent will provide a more accurate picture of how many and which local companies utilize recycled material to manufacture their products. This will not only allow MDE to track developments in the industry, but also to connect with these businesses directly to gain better understanding of their operations, needs, and business goals. A recycling tracking system will also provide better information on where materials, and thus the revenue, flow to next. Maryland can then conduct a detailed assessment of the flow of diverted waste to identify opportunities to capture a greater percentage locally.

Maryland also must assess its existing policies and find ways to provide incentives for companies to integrate recycled content in their products and operations. Arizona, for example, offers a 10% tax credit on installed equipment for individuals and corporations that produce finished products using at least 25% post-consumer recycled materials. Recycling businesses in Iowa qualify for property tax exemptions for equipment used in reprocessing paper, cardboard or plastic products. Idaho-based recycling businesses receive a 20% equipment credit up to \$30,000 per year if their post-consumer paper, glass, or plastic products are 90% recycled content or higher. Montana put the incentive on the consumer by establishing an income tax credit for individuals who purchase products made from reclaimed material. Florida implemented an income tax credit of \$500 for each new employee added as a result of incorporating recycled products into a business' process. Similarly, New Mexico's policy limits its tax credit "to recycling equipment that creates jobs, rather than reducing the workforce."³⁵ In contrast, Maryland's current tax policy for recycling businesses does not include specific incentives for remanufacturing operations and does not apply to all counties.³⁶

California may be another model. In 2012, the California Department of Resources Recycling and Recovery (CalRecycle), under direction from the state legislature and governor, established a policy goal for achieving a 75% waste diversion rate. One aspect of this policy is to increase assistance to "recycling manufacturing business by creating a assistance team within CalRecycle to better respond to their needs, e.g. attraction, retention and expansion services, site selection, permit assistance across agencies, and business plan development."³⁷ Increasing assistance will "increase the amount of material that is remanufactured in CA and reduce greenhouse gas emissions and increase jobs."³⁸ A similar program of assistance, especially regarding permitting and business plan development, could greatly benefit recycling-based manufacturing businesses currently operating in Maryland and provide incentives for new businesses to emerge.

Maryland's 39% MRA recycling level is substantial but there is plenty of room for growth. Renewed attention to waste prevention strategies – such as pay-as-you-throw trash fees and bans on non-recyclable single-use items, coupled with policies and programs to encourage in-state composting, reuse, and remanufacturing would not only reduce waste and increase recycling levels, but also spur new businesses and jobs, while protecting the environment and climate. Supporting businesses like Victor Stanley, Re-Form, and CreaFill Fibers, and encouraging others to join the industry, will create jobs, build a skilled labor force, generate local revenue, improve economic development, and divert waste from landfills and incinerators. Remanufacturing businesses are a critical component to moving toward a zero waste economy and closing the loop locally. Maryland has an opportunity to capitalize on an existing gap in the recycling chain by diverting materials from flowing out of state to in-state reuse, recycling, and composting businesses.

Appendix

Table A-1: Maryland Processors/Material Recovery Facilities

County	Business Name	City
Allegany		
	Penn-Mar Recycling	Cumberland
Anne Arundel		
	Arundel Recycling Center, Inc.	Hanover
	Baltimore Recycling	Curtis Bay
	Glen Burnie Convenience Center	Glen Burnie
	Maryland Recycle Company	Glen Burnie
	Mid-Atlantic Recycling Center	Annapolis
	Patuxent Materials, Inc.	Crofton
	Reliable Contracting, Inc.	Millersville
	Sudley Convenience Center	Deale
Baltimore City		
	Allied Waste	Baltimore
	Alternative Aggregate Recycling, Inc.	Baltimore
	AMG Resources Corporation	Baltimore
	Ansam Metals	Baltimore
	Baltimore Recycling Center	Baltimore
	Baltimore Scrap Corporation	Baltimore
	Berg Recycling	Baltimore
	Cambridge Iron & Metal Company	Baltimore
	Crushing Corporation of America	Baltimore
	DC Intercel	Baltimore
	Debois Textiles	Baltimore
	Decker's Salvage	Baltimore
	Dixie Pulp & Paper	Baltimore
	Environmental Alternative Recycling, LLC	Baltimore
	Incred-A-Shred	Baltimore
	Mid-Atlantic Metals	Baltimore
	Modern Junk & Salvage	Baltimore
	Owl Corporation	Baltimore
	Proshred Security	Baltimore
	S.H. Landsman & Son Inc.	Baltimore
	Shred Instead	Baltimore
	Sonoco Recycling, Inc.	Baltimore
	Terrapin Recycling LLC	Baltimore
	United Iron & Metal LLC	Baltimore
	Vangel Paper, Inc.	Baltimore
	Weststreet Industries	Baltimore

County	Business Name	City
	Wire Recycle LLC	Baltimore
Baltimore		
	Baltimore County Resource Recovery Facility	Cockeysville
	Days Cove Road Rubble Landfill	White Marsh
	Honeygo Run Reclamation Company	Perry Hall
	Integrity Recycling	Rosedale
	Maryland Recycle Company	Owings Mills
	Maryland Recycle Company	Rosedale
	M.R.P. Recycling Center	Cockeysville
	Recovermat Mid-Atlantic	Halethorpe
Calvert		
	Rubble Bee Recycling & Demolition, LLC	Owings
	Southern Maryland Recycling, Inc.	Owings
Caroline (Mid-Shore)		
	Donovan Salvage Works, Inc.	Denton
	Hobbs Recycling Center	Denton
	The Shred Mill LLC	Sykesville
Carroll		
	AAA Secured Shredding Services	Finksburg
	Ecotech	Sykesville
	Petry's Junkyard	Westminster
	Roll-Off Express	Finksburg
Cecil		
	Tri-State Recycling	North East
Charles		
	Breeze Farm Recycling Center	Cobb Island
	Gilbert Run Recycling Center	La Plata
	Pisgah Recycling Center	Pisgah
	Waldorf Metal Company	Bryantown
Dorchester		
	Delmarva Recycling	Cambridge
Frederick		
	All-Shred Inc.	Frederick
	Bell's Recycling Center	Frederick
	First Secure Shred Inc.	Frederick
	Reliable Recycling Company	Frederick
Garrett		
	B&S Scrap	Oakland
Harford		
	Auston Contracting, Inc.	Joppa
	Green Marble Recycling	Cardiff

County	Business Name	City
	Maryland Recycle Company	Forest Hill
Howard		
	Aggregate Industries	Jessup
	Athelas National Recovery Institute	Columbia
	Hanna Paper Recycling	Savage
	Kline Paper Mill Supplies, Inc.	Columbia
	Maryland Recycle Company	Elkridge
	Recycled Aggregates LLC	Jessup
	Shred-It	Elkridge
	Soil Safe, Inc.	Columbia
Kent (Mid-Shore)		
	Infinity Recycling, Inc.	Chestertown
Montgomery		
	Georgetown Paper Stock of Rockville	Rockville
	Montgomery County Material Recovery Facility	Derwood
	Montgomery Scrap Corporation	Rockville
	Office Paper Systems, Inc.	Gaithersburg
	Percontee Inc.	Silver Spring
	Pleasants Companies	Clarksburg
	ShredStation Express of Maryland	Silver Spring
	SP Recycling Corporation	Silver Spring
Prince George's		
	Alleghany Scrap, Inc.	Capitol Heights
	Barnabas Stone	Temple Hills
	Brandywine Enterprises	Fairmont Heights
	Capitol Asset Recycling, Inc.	Lanham
	Clinton Metal Company	Clinton
	Encore Recycling	Laurel
	Global Resource Recyclers, Inc.	Forestville
	Metro Re-Uz-It Co., Inc.	Hyattsville
	Nurtech Technology LLC	Beltsville
	Prince George's Scrap, Inc.	College Park
	Rodgers Brothers, Inc.	Capitol Heights
	Universal Recycling	Capitol Heights
	World Recycling	Cheverly
Somerset		
	Allstate Salvage Inc.	Westover
Talbot (Mid-Shore)		
	Chesapeake Development Unit	Easton
Washington		
	ARC of Washington County, Inc.	Hagerstown

County	Business Name	City
	Better Shredder, Inc.	Williamsport
	Clean Earth of Maryland	Hagerstown
	Conservit Inc.	Hagerstown
	Maryland Metals Inc.	Hagerstown
	Secondary Solutions	Funkstown
Wicomico		
	Delmarva Recycling, Inc.	Salisbury
	Eagle Recycling LLC	Salisbury
	Stonetech, LLC	Salisbury

Table A-2: Maryland Reuse Businesses

County	Business Name	City
Allegany		
	Horizon Goodwill Industries	Cumberland
Anne Arundel		
	Bike Doctor Arnold	Arnold
	Chesapeake PC Users Group, Inc.	Annapolis
	Diamond Waste Services	Glen Burnie
	Habitat for Humanity	Pasadena
	Goodwill Industries	Annapolis
	The Salvation Army	Pasadena
Baltimore City		
	Abbey Drum Company	Baltimore
	ABC Box Company	Baltimore
	Baltimore Free Store	Baltimore
	BTN Building Salvage Specialists Inc.	Baltimore
	Community Assistance Network — West Side Shelter	Baltimore
	Comprehensive Automotive Reclamation Services Inc.	Baltimore
	Debois Textiles, Inc.	Baltimore
	Earl's Place	Baltimore
	Goodwill Industries of the Chesapeake	Baltimore
	Habitat for Humanity Chesapeake ReStores	Baltimore
	The Loading Dock	Baltimore
	Play It Again Sports	Baltimore
	ROW Clothing Enterprises	Baltimore
	The Salvation Army	Baltimore
	Second Chance Inc.	Baltimore
Baltimore		
	Music-Go-Round	Cockeysville
	Plato's Closet	Towson
	Ukazoo Books	Towson
Caroline (Mid-Shore)		
	Colossal Appliances	Denton
	Schultz & Sons Salvage	Denton
Cecil		

County	Business Name	City
	Elkton Recycling Inc.	Elkton
	North East Auction Galleries	North East
Frederick		
	Frederick Non-Profit Building Supply	Frederick
	Habitat ReStore	Frederick
	Vintage Lumber Company	Woodsboro
Harford		
	Goodwill Industries	Aberdeen
Howard		
	Kemper Corporation	Annapolis Junction
	Lazarus Foundation	Columbia
	Leisure Specialties	Elkridge
	The Phoenix Project	Ellicott City
	United Way Community Resource Bank	Elkridge
Montgomery		
	1-800-GOTJUNK?	Rockville
	Cartridge Technologies	Rockville
	Davis Memorial Goodwill Industries	Gaithersburg
	Kaboodle Home Gallery	Rockville
	The Learn Shop	Wheaton
	The Upscale Resale Thrift Shop	Rockville
Prince George's		
	Automated Office Products	Lanham
	Community Forklift	Edmonston
	Computers for Communities, Inc.	Upper Marlboro
	Consignment Furniture Gallery	Beltsville
	Cove Manufacturing	Beltsville
	Mt. Rainier Antiques, Thrift, & Salvage	Mt. Rainier
	The Newel Post	Landover
	Universal Appliance Recycling	Hyattsville
Talbot (Mid-Shore)		
	International Wood Products	Queen Anne
	Primitive Wood Design	Queen Anne
Washington		
	Horizon Goodwill Industries	Hagerstown
	Tri-State Reuse Center	Hancock

Table A-3: Maryland Composting and Natural Wood Waste Recycling Businesses

County	Business Name	City
Anne Arundel		
	A-A Recycle & Sand	Pasadena
	Bronson Contracting, Inc.	Pasadena
	L and W Recycling	Odenton
Baltimore City		
	Chesapeake Compost Works	Baltimore
	Paterson Environmental Holdings, Inc.	Baltimore
	Topsoil Etc.	Baltimore

County	Business Name	City
Baltimore		
	Edrich Lumber	Baltimore
	Hollins Organic Products	Baltimore
	King Mulch and Pallett	Essex
	Northwest Recycling	Baltimore
	Wirtz & Daughters	White Marsh
Calvert		
	Sawmill Road Natural Wood Waste Recycling Facility	Lusby
Carroll		
	Better Composting Inc.	Finksburg
	C.J. Miller	Westminster
	Recycled Green Industries	Woodbine
Cecil		
	Chesapeake Wood Recycling	Elkton
	Grass Busters Landscaping	Elkton
Charles		
	James E. Hill	Ripley
	Maxi Mulch/Beuchert Excavating	Newburg
Frederick		
	Bussard Brothers Landscape	Monrovia
	Butler Wood Recycling	Point of Rocks
Harford		
	Arthur D. Heston	Whiteford
	Comer Construction, Inc.	Aberdeen
	Garrity Renewables LLC	Aberdeen
	T and M Mulch Natural Wood Waste Recycling Facility	Bel Air
	Veteran Compost	Aberdeen
Howard		
	Elkridge Recyclery	Elkridge
Kent (Mid-Shore)		
	Sharp Lawn and Tree Services	Chestertown
Montgomery		
	Acme Biomass Reduction	Brookville
	Grant County Mulch	Burtonsville
	Twin Ponds Farm	Poolesville
Prince George's		
	Eco City Farms	Edmonston
Queen Anne's (Mid-Shore)		
	Baker Rubble Landfill	Queenstown
Talbot (Mid-Shore)		
	Dependable Sand and Gravel Co.	Queen Anne
Wicomico		
	Banks of Eden Farm	Salisbury
	Eastern Shore Forest Products	Salisbury

Table A-4: Maryland Permitted MSW and C&D Landfills

County	Business Name	City
Allegany		
	Mountainview Sanitary Landfill	Frostburg
Anne Arundel		
	Millersville Landfill & Resource Recovery Facility	Severn
Baltimore City		
	Quarantine Road Landfill	Baltimore
Baltimore		
	Days Cove Rubble Landfill (C&D)	White Marsh
	Eastern Sanitary Landfill	White Marsh
	Honeygo Run Reclamation Center (C&D)	Perry Hall
Calvert		
	Appeal Sanitary Landfill	Lusby
Caroline (Mid-Shore)		
	Midshore II Landfill	Ridgely
Carroll		
	Northern Municipal Landfill	Westminster
Cecil		
	Cecil County Central Landfill	Elkton
Charles		
	Charles County Municipal Landfill	Waldorf
Dorchester		
	Beulah Municipal Landfill	Hurlock
Frederick		
	Fort Detrick — Area B & Main Post	Frederick
	Reichs Ford/Site B Municipal Sanitary Landfill	Frederick
Garrett		
	Garrett County Solid Waste Disposal & Recycling Facility	Oakland
Harford		
	Harford Waste Disposal Center	Street
Howard		
	Alpha Ridge Municipal Landfill	Marriottsville
Montgomery		
	Montgomery County Site 2 Landfill	Dickerson
Prince George's		
	Brown Station Road Landfill	Upper Marlboro
	Ritchie Reclamation — Marlboro Road (C&D)	Upper Marlboro
Queen Anne's (Mid-Shore)		
	Baker Rubble Landfill (C&D)	Queenstown
St. Mary's		
	St. Andrews' Municipal Landfill	California
Somerset		
	Somerset County Landfill — Fairmount Site	Westover
Talbot (Mid-Shore)		
	Midshore Regional Solid Waste Facility	Easton

County	Business Name	City
Washington		
	Forty West Municipal Landfill	Hagerstown
Wicomico		
	Newland Park Municipal Landfill	Salisbury
Worcester		
	Central Sanitary Landfill	Newark

¹ Platt, B. et al (1995). *Recycling Means Business in Baltimore, DC, and Richmond*. Institute for Local Self-Reliance.

² Maryland Department of the Environment. *Maryland State, County and City Recycling*. Accessed from <http://www.mde.state.md.us/programs/Land/RecyclingandOperationsprogram/StateCountyandCityContactInfo/Pages/programs/landprograms/recycling/local/recyclingrates.aspx>

³ In 2011, Maryland recycled 941,261 tons of compostables, 96,814 tons of glass, 474,644 tons of metal, 873,535 tons of paper, 59,405 tons of plastic, and 644,161 tons of miscellaneous MRA materials. Of the miscellaneous materials, 62% (399,380 tons) was incinerator ash.

⁴ Maryland Department of the Environment.

⁵ Maryland Department of the Environment.

⁶ Maryland Department of the Environment. (November 2011). *Maryland Solid Waste Management and Diversion Report 2011*.

<http://www.mde.state.md.us/programs/Land/RecyclingandOperationsprogram/StateAgencyRecycling/Documents/11%20MSWMDR.pdf>

⁷ <http://www.mde.state.md.us/programs/Land/RecyclingandOperationsprogram/Publications/Pages/Programs/LandPrograms/Recycling/publications/index.aspx>

⁸ ILSR pioneered documentation of the economic benefits of recycling with its groundbreaking 1989 study, *Salvaging the Future: Waste-Based Production*. This report on value added to discarded material presents a detailed forecast of the costs and benefits of recycling. Since then, ILSR has produced a wide range of documents on developing markets for recyclables and their economic benefits including: *Manufacturing from Recyclables: 24 Case Studies of Successful Enterprises* (EPA530-R-95-001); *Recycling Economic Development Through Scrap-Based Manufacturing*; *Preparing a Business Plan for a Small-Scale Recycling Related Venture*; *Expanding Scrap-Based Manufacturing Through the Community Joint-Venture Process*; and *Financing Recycling-Related Ventures: Options for Community Development*.

⁹ Quintini, R. & Gaudette, K. (2003). "Remanufacturing: the next great opportunity for boosting us productivity." *Business Horizons*. 41-48. p. 41

¹⁰ Quintini & Gaudette. (2003). p. 48.

¹¹ Tellus Institute with Sound Resource Management. (2011). *More Jobs, Less Pollution: Growing the Recycling Economy in the US*. Available online:

http://www.tellus.org/publications/files/More_Jobs_Less_Pollution.pdf

¹² Tellus Institute. (2011).

¹³ Tellus Institute. (2011).

¹⁴ Brenda Platt, et al, Institute for Local Self-Reliance (2013). *Pay Dirt: Composting in Maryland to Reduce Waste, Create Jobs, & Protect the Bay*.

¹⁵ Recycling Directory. Maryland Recycles.

<http://www.mdrecycles.org/recyclingDirectory.php?sec=asphaltShingles>

¹⁶ Institute for Local Self-Reliance. (2013). Recycling Survey.

¹⁷ Personal Communication, Dave Mrgich, Chief, State & County Programs, Maryland Department of the Environment, Baltimore, MD. 6/14/2013

¹⁸ Op. cit.

¹⁹ Recycling Directory

²⁰ Platt, B. (2013).

²¹ Personal Communication, Victor Stanley, Inc., Dunkirk, MD, 6/12/2013.

²² Op. cit.

²³ US Gypsum Co. website, www.usg.com

²⁴ Personal Communication, George Fisk, President, Re-Form, Baltimore, MD, 6/13/2013

²⁵ Personal Communication, C.J. Miller LLC, Finksburg, MD, 6/14/2013

²⁶ Personal Communication, Asphalt Roof Recycling Center, Mt. Airy, MD, 6/17/2013

²⁷ Personal Communication, Maryland Paper Company, Williamsport, MD, 6/14/2013

²⁸ Op. cit.

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- ²⁹ Personal Communication, Laurie, CreaFill Fibers Corporation, Chestertown, MD, 6/17/2013
- ³⁰ Executive Summary. Design Recycle, Incorporated.
- ³¹ Personal Communication, James Ingraham, Founder, Design Recycle, Upper Marlboro, MD, 6/12/2013.
- ³² Design Recycle website: www.designrecycleinc.com/
- ³³ Correspondance between Mr. James Ingraham and Maryland 5th District Representative Steny H. Hoyer, November 7, 2012.
- ³⁴ Correspondance between Mr. James Ingraham and Maryland 5th District Representative Steny H. Hoyer, November 7, 2012.
- ³⁵ United States Environmental Protection Agency. *State Recycling Tax Incentives*.
<http://www.epa.gov/wastes/conserved/tools/rmd/bizasst/rec-tax.htm>
- ³⁶ Op. cit.
- ³⁷ CalRecycle (May 9, 2012). *California's New Goal: 75% Recycling*. P. 19. Available at
<http://www.calrecycle.ca.gov/75percent/Plan.pdf>.
- ³⁸ Op. cit. p. 19.