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The



Primer

**Information and Insights
To Enlighten Your Reuse Journey**

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Other Writings by the Author

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Contents

- Preface 3
- Acknowledgements..... 3
- The Reuse Primer 4
 - Get to Know the Hierarchy 4
 - Reuse Expanded..... 5
 - A Multi-Faceted Strategy 7
 - Spotlighting Reuse Organizations 9
 - Why Should You Care about Reuse 9
 - The Benefits of Reuse 10
 - Drivers of Change..... 11
 - Measuring the Results 14
 - Challenges and Opportunities 15
 - The Lasting Impacts of Reuse 18
 - Final Thoughts and Next Steps 19
- About the Author 20
- Contact Information..... 20

Preface

A strong understanding of Reuse is the key to any meaningful discussion on Zero Waste and overall Sustainability.

I wrote *The REUSE Primer* to provide basic guidance on the often overlooked, and generally misunderstood, field of reuse. In this guide I explain reuse within the context of the materials management hierarchy, offer in-depth definitions of the many facets of reuse, highlight many of the triple bottom line benefits of reuse, and discuss some of the industry's key challenges and opportunities. I also weigh-in on industry drivers such as global climate change, and the paradigm shifting roles of sustainable materials management and zero waste systems.

I hope you find that this provides you with some insight into your understanding of reuse, and puts you in a good place to start or continue your 'reuse journey'. Please feel free to reach out to me to continue this discussion.

If you have any comments about this primer and/or suggestions on improving it, please let me know. Your suggestions will help make it a stronger resource for all to benefit from.

MaryEllen Etienne
Dayton, Ohio
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Acknowledgements

I would like to thank everyone – friends, family, colleagues, funders and other stakeholders – for everything they have done, and continue to do, to support my efforts to advance reuse.

At times my chosen profession has proven to be an uphill battle (and continues to be), but I'm thrilled to be involved with something I feel passionately about.

Several esteemed colleagues helped review *The REUSE Primer*, and I would like to thank them for their valuable input and critique including Cat Fletcher, Maggie Clarke, Jacquelyn Ottman, Kelley Carmichael Casey, Norm Ruttan and Roger Guttentag.

The Reuse Primer

Get to Know the Hierarchy

As the saying goes ‘to know where you’re going, you have to know where you’ve been’, which is why I start any discussion on reuse with an overview of the materials management (or ‘waste management’) hierarchy. This illustration from the [Reuse Institute](http://reuseinstitute.org) depicts the main materials management categories, as well as the order in which they should be prioritized. From top to bottom of this inverted pyramid (i.e. most preferred activity on the top to the least preferred on the bottom) there’s ‘reduce’ and ‘reuse’ followed by ‘recycle’ and ‘disposal’.



Reduce, which is also known as ‘Source Reduction’ or ‘Waste Prevention’, is any change in the design, manufacture, purchase and/or use of materials, products and packaging to reduce their amount or toxicity before they are consumed and/or discarded and become solid waste¹.

Reuse involves extending the life of a product, packaging or resource by 1) using it more than once with little to no processing (same or new function), 2) repairing it so it can be used longer, 3) sharing or renting it, or 4) selling or donating it to another party.² It should be noted that even though reuse always reduces waste, source reduction doesn’t always incorporate reuse. Ideally, when products reach end of life (e.g. used, repaired, repeat) it would then be recycled.

Recycle (or down-cycle) is a series of activities by which material that has reached the end of its current use is processed into material utilized in the production of new products.³

On occasion people confuse reuse and recycling, or use the terms interchangeably. I like to do my part in clearing this up. From the definitions above you know reuse extends the life of a product and recycling breaks down a product into its raw materials. To illustrate the difference, let’s use the example of unwanted scrap wood. Reuse would turn this unwanted wood into flooring or furniture, whereas recycling would turn this wood into sawdust or mulch.

¹ US Environmental Protection Agency, <http://epa.gov>

² Reuse Institute, <http://reuseinstitute.org/resources>

³ National Recycling Coalition, <http://nrcrecycles.org/nrc-updates-definition-of-recycling/>

This is not just semantics. Reuse and recycling are clearly not the same concept, activity or strategy, and we need to get in the habit of using the terminology correctly.

It's also important to note that reduce and reuse are higher on the hierarchy because their environmental benefits generally outweigh those of recycling. There are a few exceptions here, including outmoded electrical equipment and older building materials which may be energy wasters when compared to new energy-efficient models. An example of this would be older appliances. Reused as-is they remain energy hogs, but I have seen their lives extended through ingenious upcycling projects (a refrigerator transformed into a patio cooler⁴).

Finally there are **discards** – waste, trash, garbage, or whatever you prefer to call it, which is any resource that someone has decided to, or is legally obliged to, dispose of. Most of the time the materials in this final stream can and should be diverted through the previous categories, but isn't. This can be due to lack of outlets, lack of awareness, or any multitude of reasons. Please see the sections on 'Drivers of Change' and 'Challenges and Opportunities' for more detail.

Reuse Expanded

While the definition of reuse provided in the previous section is adequate, reuse is far more complex and has many more moving parts. To expound on this definition, I assert that reuse includes, but is not limited to, the following activities or 'sub-sectors':

- **Adaptive Reuse** refers to the process where an old/underutilized building is refurbished for a new purpose (e.g. when a defunct hotel is turned into a seniors housing complex or an empty big box store is turned into a community center). It is a combination of conventional reuse and creative reuse;
- **Collaborative Consumption** (a.k.a. sharing economy) is an economic model based on the reuse (sharing, swapping, trading, renting) of goods and services, thereby encouraging access to the utility of the goods over ownership of the goods;
- **Conventional Reuse** is when the item is used again, as-is, for the same function it was manufactured for (e.g. clothing/furniture resale);
- **Creative Reuse** (a.k.a. upcycling, repurposing) is when the addition of innovation/creativity brings a new function to unwanted materials (e.g. furniture made of old sign posts, jewelry made of scrap materials) in such a way as to create a product of higher quality or value than the original;
- **Deconstruction** is the process of selectively dismantling a building into its components so that the building materials (e.g. lumber, doors, cabinetry, fixtures, etc) can be reused and/or recycled. It differs from demolition where buildings and their component materials are destroyed and reuse and recycling is not prioritized;



⁴ DIY Cozy Home: <http://diycozyhome.com/old-fridge-into-patio-cooler>

- **Durables** are goods that are designed to last for multiple years (3 or more years according to the US Department of Commerce) and/or are designed to replace disposables/single-use items (e.g. steel canteens instead of disposable water bottles);
- **Food Rescue** (a.k.a. food recovery, intercepted food waste) is the practice of safely retrieving edible food that would otherwise be wasted, and distributing it to those in need. Recovered food must be safe and edible by people or animals. In some cases it is food that is not saleable, that is past its 'sell by' date or 'imperfect' in some way (although advocates are working to remove the last part of this equation). In other cases the food is saleable, but restaurants or retailers may have ordered too much, or may have edible pieces of food (e.g. scraps of fish or meat) that are by-products of the process of preparing foods to cook and serve. In addition, food manufacturers may donate product that marginally fails quality control or that has become short-dated. Food rescue organizations ensure edible food is retrieved safely and is still edible by the time it gets moved, prepared and served;
- **Freeganism** is the act of intercepting discarded materials, mainly out of the waste bins of retail stores, and not paying for it. It is unlike the Sharing Economy, which emphasizes the monetization of sharing assets, and it preempts reuse centers and materials exchanges;
- **Gifting** (a.k.a. regifting) is the act of giving away unwanted, but usable, items to others instead of disposing of them. This term is often associated with online groups that help facilitate these exchanges for their members (e.g. Freecycle US, Freegle UK);
- **Lending Libraries** (a.k.a. intensive use) is when items are loaned among a group of users/members (e.g. tool lending libraries);
- **Materials Exchange** (a.k.a. waste exchange, virtual exchange) is a service that facilitates the exchange of goods from individuals and/or organizations that have reusable goods they no longer need to others that can use them, thereby diverting usable materials from the landfill. These exchanges can be done through a material 'broker', an online interface, or a combination of both;
- **Product Evaluation and Repair Facility** (PERF) is a facility and/or process that evaluates and triages used products to see if they function properly and/or are safe as-is, and if not, provide a recommended course of action (e.g. refurbish, remanufacture, recycle) to take internally or externally. This process is especially important with electrical/electronic goods and building materials;
- **Reclamation** (a.k.a. salvage) is the process of collecting and often reprocessing discarded materials for reuse (e.g. beams are collected from an old barn and are transformed into flooring);
- **Rental** (a.k.a. intensive use) is when an item is leased out for a specific amount of time and money, and is governed by either a verbal or written agreement (e.g. tool rental, service-ware rental, car rental);
- **Refurbish** (a.k.a. reconditioning) is when used product defects have been found, repaired and/or upgraded to ensure they can continue functioning (e.g. refurbished electronics, reupholstered furniture);
- **Remanufacturing** is a process of disassembling, repairing and reassembling a manufactured product so that the product matches the performance of a new product. Remanufacturing



requires the repair and/or replacement of components that are worn out, obsolete, and/or subject to degradation that may affect the performance/expected life of the product (e.g. toner remanufacturing);

- **Repair** is when an item is reconditioned so that it can be used for the same function it was manufactured for (e.g. shoe repair, computer repair);
- **Reusable** is when an item is designed and manufactured to be used over and over again, and to replace disposable/single-use items (e.g. stainless steel canteen, no-waste lunch kit);
- **Salvage** (a.k.a. reclamation) is the process of collecting and often reprocessing discarded materials for reuse and/or rescuing reusable spare parts from discarded products that would allow continued use of other products. (e.g. car parts from wrecked cars);
- **Second-Hand Markets** (a.k.a. flea market, swap meet, boot sale, rummage sale, garage sale) is a type of bazaar that rents space to people who want to sell or barter merchandise. Used goods, both low quality items and high quality items (e.g. collectibles, antiques) are commonly sold. Depending on the type of event, the revenues from the sales may be for personal gain or they might go to support a charity;
- **Sharing Economy** (a.k.a. collaborative consumption) is an economic model based on the reuse (sharing, swapping, trading, renting) of goods and services, thereby encouraging access the utility of goods over the ownership of goods. This generally includes the act of monetizing these exchanges (e.g. ZipCar, AirBnB);
- **Water Reuse** (a.k.a. reclaimed water) is water that is reclaimed and used again. Depending on its level of treatment this water can be used as a non-potable water source (e.g. irrigation, meeting commercial and industrial water needs) or as a potable water source (e.g. drinking, cooking).



A Multi-Faceted Strategy

Reuse encompasses a vast range of activities that connect many variables (who is reusing the material, what activity is involved, etc). While reuse extends the economic life or social utility of products, structures and resources; the strategies involved are not mutually-exclusive, can flow from one to another, or even be a hybridized version of several activities. The following table walks you through this concept.

Strategy	Activity	Details/Examples	Resources
Displacing a single-use product	Environmentally Preferable Purchasing	Buying consumer reusables (bags) or commercial reusables (pallets)	Reuselt.com, Reusable Packaging Association
Extending life or utility of a resource through an intervention	Repair / Refurbishing	Seeking professional repair services, taking part in community fixer events	Repair Café International, Fixit Clinic, iFixit

Extending life by transferring to a different owner	Remanufacturing	Sending engine parts out to be retooled or buying remanufactured IT equipment	Automotive Parts Remanufacturers Association, Remanufacturing Institute
	Deconstruction/Salvage	Visiting architectural salvage shops	Reuse Consulting
	Building Materials Reuse	Shopping at building material reuse centers	Building Materials Reuse Association
	Water Reuse	Installing a grey water system	WaterReuse Association
	Participating in a Online Resale	Posting items for sale	Craigslist, eBay
	Third Party Resale Shop	Consigning clothing or kids gear	Once Upon a Child, Play it Again, Buffalo Exchange
	Online Gifting Exchanges	Posting free items	Reuse Marketplace, Freecycle, Freegle
Intensive use of a specialized product	Physical Exchanges	Attending community swap events	Really Really Free Markets
	Donation Programs	Offering items to a nonprofit in exchange for a tax deduction	Goodwill Industries International, Food Recovery Network
	Sharing Programs	Participating in seed sharing libraries and community refrigerators	Tool Bank USA
	Rental Businesses	Renting specialized tools , serviceware for parties, costumes	American Rental Association
Creating a new use by same/different owner	Adaptive Reuse	Transforming an old mill into offices or a event space	AdaptiveReuse.info
	Creative Reuse Centers	Purchasing surplus art materials and industrial by-products from creative reuse centers	Creative Reuse Association
	Upcycled Designers & Reclaimed Materials Artists	Transforming one company's discarded wood into reclaimed-material furniture	Kuttlefish
	DIY Upcycling	Using salvaged/surplus materials in residential or commercial construction projects	Reuse Marketplace

Spotlighting Reuse Organizations

Generally speaking ‘reuse organizations’ are entities that facilitate the transfer of unwanted, yet perfectly usable, materials and equipment from one entity to another. The parties that benefit from either side of this service (as donors, sellers, recipients, buyers) can be businesses, nonprofits, schools, community groups, and individuals. These transfers can be free or can be monetized. While the legal structures of the majority of these groups are non-profits and for-profits, others are public agencies or even public-private partnerships.

Some reuse organizations maintain a physical, bricks and mortar space (Reuse Centers), and others act as an online match-making service that either brokers materials or offers peer-to-peer exchanges (Materials Exchanges). Reuse Centers generally maintain both warehouses and trucks. They take possession of the donated materials and make them available for redistribution or sale. Materials Exchanges may not have physical space or trucks, but instead allow users to post listings of materials available and wanted (for free or at low cost) on a web-based exchange platform. Staff can help facilitate the exchange of these materials without ever taking possession of the materials. Please note that a Reuse Center with physical space can also have a Materials Exchange program to handle materials that cannot be accepted due to limitations with space, time, quality, types of material or some other reason.

I’m often asked if reuse organizations are only interested in reducing waste. Whenever that happens, I quickly reply that the opposite is more often the case. The core missions of most reuse organizations generally have little or nothing to do with their reuse activities. While their reuse operations partially or fully fund their social missions (e.g. feeding the homeless, providing essential supplies to poor mothers, offering supplies and equipment to school children, vital resources to nonprofit arts organizations) most don’t even realize they’re part of the Reuse Movement until they are informed that they are. This is when the proverbial light bulb goes off. Causing these ‘ah-ha’ moments is a favorite pastime of mine.

Why Should You Care about Reuse

Now that you know what reuse is, let’s discuss why you should engage in it and advocate for it. First, and foremost, there’s the simple fact that the Earth is a closed system. There are finite raw materials available and not enough resources to continue to make endless amount of ‘stuff’ for the growing global population and the ‘consumer class’. We need to do better a better job at conserving these limited assets, and extend the lifecycle of products and resources.

Then there’s the scientific argument. 97% of climate scientists agree – global climate change is happening and we have only just begun to feel the effects (drought, floods, severe weather). Now that we live in a global economy a drought in one place can have a severe effect on food



and other products around the world. We need to take immediate measures to address climate change and deal with its underlying economic realities that cause it.

Lastly, there's the moral argument. Pope Francis has been widely hailed for his urgent call to action on climate change. In 'Laudato Si' (Praised Be), Pope Francis' encyclical on the environment, he states that we have already reached the tipping point of the issue of climate change and we have no choice but to return back to the riches of spirituality to create new paradigms and new solutions to environmental exploitation and degradation. As the encyclical states, "We need a conversation which includes everyone, since the environmental challenge we are undergoing and its human roots, concern and affect us all".

If you're not inclined to listen to a religious figure, but you still think waste is, well, a 'waste' – you can always adopt the simple-living slogan: 'use it up, wear it out, make it do or do without' popularized during war-time rationing. Personally, I am more inclined to embrace the concept of [mottainai](#), a Japanese term conveying a sense of regret concerning waste. In fact, the expression 'Mottainai!' is exclaimed when something useful is wasted, meaning 'what a waste!'

Whatever reason compels you to get involved; I'm just thrilled to have you on board!

To make a change we need to work together, immediately, with the tools at hand. One of the simplest ways any community, business, or individual can make lasting environmental, economic and social impact is to support reuse. By engaging in reuse you can help change the culture of thoughtlessly trashing items, reduce your ecological footprint and strengthen and green our economy.

The Benefits of Reuse

Simply stated reuse offers 'triple bottom line benefits', or as some folks say 'people, planet, profit'.

By diverting valuable resources from landfill, reuse offers numerous environmental impacts. These benefits include saving the embodied energy of manufactured goods (i.e. manufacture, transport, and usage), reducing greenhouse gas (GHG) emissions and other forms of air pollution, conserving natural and man-made resources, and reducing plastic pollution through elimination of single-use materials.

But reuse does more than conserve resources; it is also a tremendous economic engine. I often say 'reuse is the original green collar job', and thankfully

Case Study: The Economics of Minnesota's Reuse Industry

- An economic impact study was conducted by the Minnesota Pollution Control Agency (environmental protection)
- The study found that the reuse industry in Minnesota (e.g. used, rental, repair):
 - Directly employs approximately 46,000 people in the state.
 - Provides 4,600 indirect jobs in supporting sectors.
 - Generates at least \$4 billion in gross sales annually.
 - Companies are mostly locally-owned and operated, therefore increasing capital retention in the region.

there's data to support this. According to a study by the Institute for Local Self Reliance, if you take 10,000 tons of materials and incinerate it you create 1 job, landfilling the same amount creates 6 jobs, recycling it creates 36 jobs; while the reuse of these same materials can create 28-296 jobs (this range factors in the labor intensity of reusing a wide variety of materials).

In addition to creating jobs, reuse provides businesses and individuals with tax benefits, supplies sales taxes which contribute to the economy, serves consumers who want environmentally preferable purchasing options, and generates revenues for individuals, entrepreneurs and nonprofits.

Along with its economic impacts, reuse is socially responsible. It offers cost savings to people and organizations with limited means, provides goods to people who would otherwise go without, and creates meaningful, living-wage employment opportunities.

To summarize, by engaging in reuse you are creating many long-lasting impacts, including:

- Finding markets for unwanted, yet usable, materials
- Receiving/purchasing low or no-cost, environmentally-preferable materials
- Lowering your disposal costs and/or purchase costs
- Reducing greenhouse gas emissions, other forms of air pollution and water pollution
- Reducing waste and saving landfill space
- Creating/maintaining green collar jobs
- Enhancing the environmental image of your company
- Supporting nonprofit organizations through in-kind support
- Contributing to the growth of the circular economy

Slowly but surely, reuse is addressing environmental concerns, over consumption, resource inequality, under/unemployment and much more. It's clear to see why I say **reuse is a win-win-win solution!**

Drivers of Change

The following section covers some the key drivers that are helping decision-makers start to take notice of reuse and the triple bottom line benefits it offers to their communities, businesses and households. In order to get a better grasp of reuse, it's good to get acquainted with these important issues.

Global Climate Change

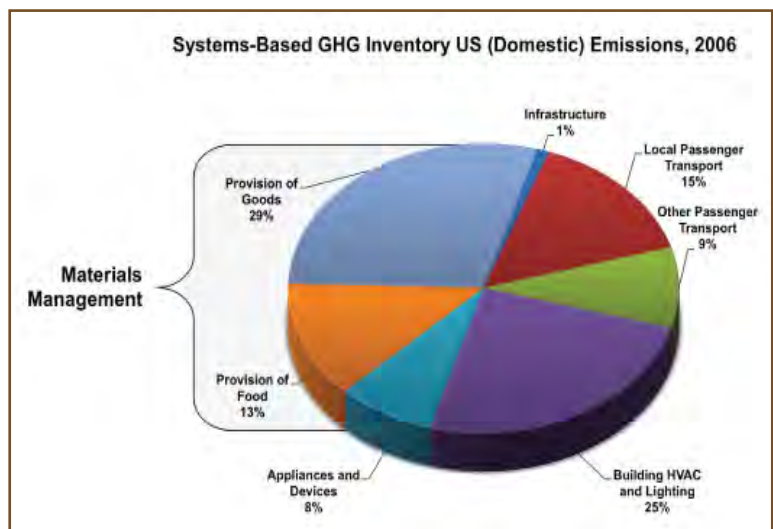
Many factors have contributed to climate change, some over centuries others over decades. While natural conditions (solar output, volcanic eruptions, etc) have always been at work, the impact of human activities grew tremendously in the 19th, 20th and 21st centuries. Ozone depletion, shifts in land use, permeability and surface reflectivity (heat islands), particulates from extracting and burning fossil fuels, deforestation and GHG emissions from waste management activities and landfills have altered the Earth at an alarming rate. In response to

climate change, environmental advocates, businesses and others have been calling on global leaders to seek a radical course of action to stem the tide.

Sustainable Materials Management

Recently there has been a major shift to move away from ‘Waste Management’ and towards ‘Sustainable Materials Management’ (SMM), or in Europe towards the term ‘Resource Management’. And this isn’t just semantics. Rather than just making better decisions about the end of a product’s lifecycle with recycling and discard management – this shift refers to the highest and best use of materials across their entire life cycle (engaging in redesign, prioritizing reduce, fully utilizing reuse and recycling, and minimizing incineration and landfilling). SMM conserves resources, reduces waste, slows climate change, and minimizes the impacts of the materials we use.

The following table from the US Environmental Protection Agency (EPA) shows the different types of waste management activities and how many greenhouse emissions are created by them. Prior views of the impact of wasting showed it generating approximately 1-3% of US GHG, but the 2009 EPA report shows 42% of US GHG emissions are associated with the production, processing, transport & disposal of the food we eat and the goods we use. This includes extraction of materials and food, production and transport of goods, provision of services, etc. This may seem like bad news but it has actually elevated the importance of materials management, and therefore it elevates reuse.



Circular Economy

Rather than looking at our systems as one-way and linear we need to redesign them to be circular and cyclical, as in nature, where there’s no such thing as waste and materials are kept in the production cycle. The Circular Economy is an emerging paradigm shift, away from the make-use-toss system and towards a new, comprehensive system that addresses our resource use from product design to disposal.

Zero Waste

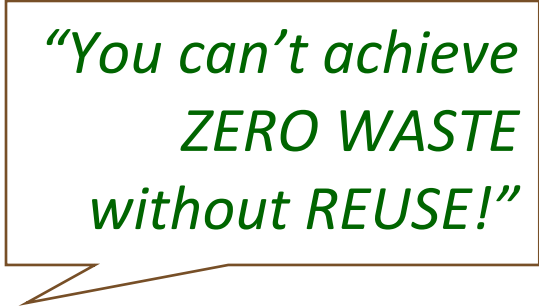
Zero Waste is a goal that is ethical, economical, efficient and visionary, and guides people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use. Zero Waste means designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them.

Implementing Zero Waste will eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health.⁵

In essence, Zero Waste involves achieving 90% or better diversion without landfilling or incineration (i.e. “no burn, no bury”). But it isn’t just about diversion; it’s also about preventing waste and toxic discharge from occurring in the first place by changing our culture of consumption and convenience and recovering the value of discarded products and materials.

Zero Waste is so much more than just collecting recyclables and turning them into new products, it’s about investing in a complex and sustainable approach to materials/waste management where unwanted materials are directed to their highest and best use. In light of climate change, it is imperative that we focus on waste reduction and reuse, together with a more balanced viewpoint that acknowledges that recycling alone cannot help us meet our zero waste goals.

I am a firm believer in Zero Waste, but I also believe that you can’t achieve Zero Waste without reuse. You can even quote me on that.



*“You can’t achieve
ZERO WASTE
without REUSE!”*

Investments in the Reuse Infrastructure

Recently CEOs from top waste haulers have gone on-record saying that the curbside recycling model is broken and processing costs are outpacing commodity revenues⁶. To combat this, recycling advocates have come out to debunk some common myths around recycling⁷.

My take on it is pretty simple, I support recycling but it has its time and place. Rather than relying so heavily on recycling, we need to look upstream, prioritize waste reduction and invest in reuse. Recycling is meant to be the last (pre-discard) step in our hierarchy, and not the first step. Let’s apply the hierarchy correctly, and put our money where our mouth is.

A perfect example is this ‘invest in reuse’ model is a recent 400,000 GBP investment by FCC Environment, a resource management firm in the United Kingdom, to open a [reuse center](#). In partnership with local governments, the reuse center will divert reusable items away from the waste and recycling centers operated by FCC and will ensure a wide range of useful goods, from bicycles to furniture, will be reused instead of landfilled. In addition, a portion of the money raised by the reuse center will be donated to local charities.

I would love to see this type of private-public partnership take hold around the globe.

⁵ ZWIA, <http://zwia.org>

⁶ “Hauler CEOs discuss 'broken' curbside recycling model”, Bobby Elliott, Resource Recycling, June 9, 2015

⁷ “4 Big Recycling Myths Tossed Out. No, “blue bins” are not what’s causing America’s trash problem.”, Luke Whelan, Mother Jones, July 13, 2015

Other Drivers

This is not a comprehensive list, but here are some additional concepts that should be considered in any discussion about reuse:

- Redesigning manufactured products: We need to reduce waste before it happens, in the design phase. This ensures products and packaging are designed and manufactured with the use of non-toxic materials and designed for reuse, recycling and composting. The EPA's Design for Environment Program is a perfect example of how supporting a businesses effort to redesign their products can affect change.
- Empowering green consumers: While the number and buying power of green consumers is growing, we need it to support its future development through education campaigns and a stronger supply of reusable materials.
- Recovery infrastructure: There have been significant capital investments within the recycling industry over the last twenty years. We need to see more federal, state/provincial and local investments in reuse infrastructure coupled with divestment in disposal infrastructure.
- Utilizing extended producer responsibility (EPR): These policies put legal, financial and environmental responsibility for materials entering the waste stream with manufacturer, rather than consumer/government at the end of life. While many EPR policies have a net positive result, it should be noted that some of these policies promote recycling to the exclusion and detriment of reuse.
- Enacting Pro-Reuse Legislation: The use of legislative tools (e.g. Zero Waste legislation, plastic bag bans, polystyrene bans) can help spur the reuse economy; however, other pieces of legislation can unintentionally disincentivize reuse. For example in 2013 the European Union rolled out a directive where there is no tax on new build construction but a 20% tax on retrofitting or renovations in existing buildings. So in the process of propping up the new building construction economy they have penalized the adaptive reuse of buildings.

Measuring the Results

According to the [McNamara Fallacy](#), "what can't be easily measured really doesn't exist", and involves the process of making a decision based solely on quantitative observations and ignoring all other factors. While we know this isn't true (otherwise reuse would just be a myth), the reuse industry does know that it has to be a better job of measuring its impacts.

Reuse industry stakeholders – from funders and investors to donors and customers – rarely support a reuse operation simply out of the kindness of their hearts. More often than not they want to know what kind of 'return of investment' they will get from their support, even if the return is simply knowing their money is being wisely spent.

The reuse industry needs to measure its impacts so we know where to focus efforts (e.g. where to support reuse infrastructure, how to design reuse operations). Capturing key performance indicators and other statistics are vital to keeping make the industry more efficient and to keep our stakeholders informed and happy.

There are many ways of measuring the positive environmental, economic and social impact data reuse has on our communities. These include, but are not limited, to the following:

- # of tons diverted from the landfill (and # years of life added landfills through diversion)
- # MTCO₂ Metric ton of carbon dioxide avoided
 - Upstream: derived from weight of material reused and the embedded resources used in the manufacturing process (fossil fuels, extraction, refining), transportation of products, etc.
 - Downstream: derived from avoided incineration and landfilling
- \$ avoided disposal costs (donor/seller)
- \$ avoided purchase costs (recipient/buyer)
- \$ value of materials donated (donor)
- \$ revenues earned (donor/seller)
- # of job created or retained and/or the value to the local economy
- # of families/individuals/organizations assisted

Challenges and Opportunities

We want to do the ‘right thing’, but reuse can often be challenging – to say the least. The following section highlights some of the major barriers to reuse, as well as some of the ideas, opportunities and/or tools we can use to overcome them.

Consumer Behavior

One of the biggest issues we face is changing consumer behavior. Our modern culture actively encourages consumers to adopt ‘use it and forget it’ and ‘convenience trumps all’ attitudes towards many products. Single-use plastic bags are a perfect example. It can take significant habit changes to occur in order for people to transition from single-use to reusable shopping bags.

The use of [community-based social marketing](#), which integrates marketing, social psychology and other approaches to influence an individual’s behavior for the greater good, could be an especially useful tool to educate global citizens about reuse.

And while I would prefer to see large-scale adoption of reuse through voluntary means, in some cases the most progress I have witnessed has been through policy and legislation. To give you an idea as to the impact it can have, ChicoBag is mapping thousands of [plastic bag ban legislation](#) around the globe.

Product Design

Most manufacturers do not design their products with reuse in mind. For example some cell phone manufacturer’s new products have non-removable/replaceable batteries and non-expandable storage unlike their earlier versions. We would like to see this change. Waste prevention, reusability and recycling needs to not only remediate the bad design choices of the past, but prevent new ones from cropping up in the future.

The EPA's [Design for Environment](#) (DfE) Program is non-regulatory initiative that helps companies consider human health, environmental and economic effects when designing and manufacturing commercial products and processes. This is a step in the right direction, but we continue to urge corporate leaders to adopt DfE and similar global programs, to turn the dial.

Infrastructure Investment

One of the most important challenges facing reuse is the lack of investment in its infrastructure. When there are funding opportunities, they generally fall under the auspices of recycling market development at state environmental regulatory agencies. The problem is you can't compare reuse and recycling – it's apples to oranges. Reuse has tremendous environmental, social and economic benefits but the one area these agencies focus so heavily on – tonnage – is the one area where it's difficult to directly compete. While it's hard to compete with tonnage, economic value is where reuse shines. A ton of reusable products are far more valuable than a ton of paper or plastic. We just need to change the investment models so that we're comparing apples to apples.

Enter the concept of [Social Return on Investment](#) (SROI), a principles-based method for measuring financial value that can be used by any entity to evaluate impact on stakeholders, identify ways to improve performance, and enhance the performance of investments (i.e., simple ROI does not currently reflect the environmental and social values). I believe a widespread adoption of SROI would dramatically improve the number and amount of investment in the reuse industry.

Niche Markets

Related to poor investment in reuse infrastructure is the industry's own issue of niche markets. For-profit reuse firms generally service a finite market (e.g. architectural salvage, manufacturing reusables, remanufacturing) and many non-profit organizations service a limited mission (e.g. job creation, bridging the digital divide, assistance for asylum seekers, teacher resources). To meet their mission and their bottom lines, most reuse organizations generally 'cherry pick' from the available reusable materials. The problem is that there's a huge amount leftover in this process. It's unlikely that working with existing players using their existing business models will allow us to achieve 100% of potential reuse.

Just like local governments are involved in recycling and composting, the public sector needs to be involved in reuse. For example the [Montgomery County Material Reuse Facility](#) (or 'McMRF' as it's known locally) collects unwanted, yet usable, materials from individuals and businesses and redistributes them to local non-profit organizations for free. On top of this type of facility, there's an opportunity for local governments to establish seasonal or regular curbside pickups for reusable materials. Reuse centers can be tapped to help local reuse businesses and nonprofits manage the flow of materials. These activities are a perfect complement to the implementation of a product evaluation and repair facility (PERF).

Data and Measurements

Another problem facing the industry is that measuring the impacts of reuse is often time-consuming and unwieldy. Physical reuse operations don't have a consistent flow of materials, and online reuse sites have a problem getting results out of people after they've exchanged goods. To date, there are very few tools and resources we can call upon to make this easier. Some reuse-centered software platforms, such as iWasteNot, have built in measurement tools in their software – but these are currently only available to their subscribers. The EPA maintains the [WaRM Model](#) to determine weights and volumes of materials, but their information is geared to recycling commodities and is weak on reusables with the exception of some building materials. I continue to encourage EPA to revise the WaRM model to work with the reuse industry to include more reuse. If you agree, please do the same. Despite these challenges we need to continue to encourage measurement.

To help address this issue more systematically, one of my 'works in progress' is a research project to develop an industry-backed '[Reuse Sector Data Standard](#)', which is a common language and methodology for capturing the triple bottom line impacts of reuse. We will establish a uniform measurement system for the reuse industry and create an online tool that offers data collection and communication tool for sector members and informational resources for the public. These systems will allow reuse organizations to increase their diversion rates, improve public awareness and access to their reuse services, and share best practices.

Technology

There are hundreds of opportunities for individuals and businesses to participate in reuse yet we continue to landfill millions of tons of unwanted, yet usable, items because people aren't aware of the reuse opportunities available to them. Changing our wasting culture is imperative to mitigate global climate change, strengthen and green our economy and reduce social inequities, so thankfully technology is helping support reuse.

Online reuse options, such as Freecycle, Freegle, iFixit, ReuseMarketplace, and ShopGoodwill, have been leading the charge for years and newer services like Kuttlefish and OfferUp pop up daily. Not to mention all of the bricks and mortar reuse services near you.

To help find all of the reuse products and services available to you, reuse industry leaders are working on a [Global Reuse Map](#) – a comprehensive crowd-sourced reuse directory. Once complete, you'll be able to plug in your location and search by reuse category (reuse center, food donation, reusables, rental, repair, thrift, etc) and by activity (donate, sell, buy, rent, share). It's a work in progress, but I hope you will help us build and grow it.



Transportation

In many regions around the globe there is often inadequate transportation to pick up and/or drop off materials which can hinder reuse.

There is a great example of how a strategic partnership between [Uber and Goodwill Industries](#) is making spring cleaning easier for those without transportation. On May 2, 2015 Goodwill and Uber partnered in more than 50 cities across the United State where both Goodwill and Uber operate. Participants would request an Uber car, which would come to their house, pickup bags of clothing and household goods and deliver them directly to a local Goodwill donation center for free. This is a fantastic idea that could and should be replicated.

Stigma

In some cultures and/or socio-economic classes there is a lingering stigma associated with reuse. In the past it was a virtuous to be frugal and resource-efficient, and thankfully this ethos is starting to [make a comeback](#) in a big way.

In fact fashion-conscious millennials are increasingly passing on trips to the mall in favor of thrift and vintage clothing shops and are using online resale sites such as Craigslist, eBay, ShopGoodwill and thredUP to guide their choices. Some 16 to 18 percent of Americans now shop at thrift stores, according to America's Research Group. This compares to 11.4 percent of Americans who shop in factory outlet malls, 19.6 percent in apparel stores and 21.3 percent in major department stores. We hope to see this trend continue to rise.

While this may not be an exhaustive list of the challenges and opportunities we face, I hope it gives you a better understanding of the reuse industry – our present state and *our bright future*.

The Lasting Impacts of Reuse

The recovery and redistribution of unwanted, yet perfectly usable materials (i.e. reuse) is an environmentally and economically sound alternative to discarding items as trash. In contrast to recycling, which processes discards to extract components for the manufacture of a new product, reuse preserves a material's resources, including the value of the materials, labor, technology, and the design and energy incorporated in them.

By taking useful products and exchanging them, without reprocessing, reuse helps save time, money, energy and resources. In broader economic terms, reuse offers quality products to people and organizations with limited means, while generating jobs and business activity that contribute to the economy. Regardless of your business or need, reuse is a great way of lowering your costs either through the purchase of materials or in their disposal, and of course, contributing to a cleaner environment and less wasteful society.

There are hundreds of thousands of reuse and remanufacturing organizations operating successfully throughout the USA and abroad that have diverted hundreds of thousands of tons

of material once destined for landfills. These services provide savings to companies in terms of disposal and material costs. Many companies spend a significant percentage of their budgets on waste disposal and raw materials. Many of these costs can be reduced through exchanging materials; turning what was once a significant drain on financial resources into profit.

Final Thoughts and Next Steps

The good news is that the Reuse Movement is growing, and our biggest asset is YOU! The movement is chock full of innovative thinkers and passionate doers. We see a problem and we try to fix it. I thoroughly enjoy the entrepreneurial spirit of the people that make up the reuse movement – and I look forward to welcoming you to it. To better connect with reuse I recommend some ‘next steps’:

Actively engage in reuse – Donate and shop at your local reuse center, rent specialized equipment, use your creativity to repurpose materials, share/gift unwanted goods through swap sites/events, and repair your stuff.

Break the single-use habit – Ditch your disposables, from plastic bags and water bottles, to party-ware, straws, to-go boxes and dryer sheets. [Reusable alternatives](#) exist for all of these culprits. And once you make the switch to reusables, get in the habit of using them.

Get involved in the Reuse Movement –

- Find out all you can. [Reuse Institute](#) curates an open-source [resource library](#), and there’s also a must-see documentary called [REUSE! Because You Can’t Recycle The Planet](#).
- Get vocal. Start asking the businesses you frequent to take responsibility for the products they’re putting out into the world and to support reuse.
- Sharpen your skills: Sign up for [Master Reuser](#) to hone your reuse knowledge and skills; and attend [ReuseConex](#), to learn, network and share best practice with industry experts.
- Invest in reuse. Share [the Global Reuse Map campaign](#) on social media, pledge financial support and when it’s live help us crowd-source it with reuse resources. Sharpen your skills.



Thank you for taking the time to read *The Reuse Primer*. I hope it has shed light on reuse and has provided insight, information and resources you can use in your reuse journey.

Happy Reusing!

About the Author

After MaryEllen Etienne's chance viewing of a PBS special on reuse, she was spurred to take a cross-country adventure that allowed her to reconnect with a thrifty upbringing. For 20 years since that experience, MaryEllen has been working in the 'wonderful world of reuse' and is now the CEO of [Reuse Institute](#) – a nonprofit dedicated to increasing awareness of reuse through educational events, training services and research projects, and the producer of [ReuseConex](#), the first and only international reuse conference and expo.



MaryEllen has extensive experience in finding new markets for reusable materials, conducting reuse industry research and improving reuse operations. She provides ongoing input into the industry's growth and development, and helps businesses, municipalities, and nonprofits incorporate robust reuse policies and strategies into their sustainability efforts. Recently, MaryEllen contributed to the development of a national standard for sustainable resource management training programs and the nation's first certification for zero waste facilities and professionals. MaryEllen is the founder of Reuse Alliance and a co-founder of REUSE.International and Creative Reuse Association. Prior to Reuse Institute, she ran Reuse Alliance and ReuseNYC and worked at London Community Resource Network, NY WasteMatch, Materials for the Arts and AmeriCorps VISTA.

MaryEllen is on the board of directors of Association of Ohio Recyclers, Reuse Institute, SCRAP USA, and is on the certification boards of the National Recycling Coalition and the US Zero Waste Business Council. She received her degree from the State University of New York at New Paltz. MaryEllen originally hails from New York but has made Dayton, Ohio her new home with her husband and son.

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