June 2020

**Talking Trash: Cleaning Up America’s Act**

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Recycling is broken. The favored environmental solution in the US is failing, highlighting an even more concerning problem: parts of the country are running out of disposal capacity. With limited practical options, the cost of disposal is creating huge economic ripples that are just now coming to light.

There are solutions available, but they will require behavioral changes, from consumption through disposal, creating ample room for savvy innovators and targeted investment opportunities. Despite the pandemic’s recent impact on the economy, we expect this trend to continue as waste generation has merely shifted from the workplace to the home in many instances. The economic recovery remains uncertain, but the slowdown has not created more disposal capacity.

Waste companies continue to navigate the pandemic, adapting to accommodate shifts in waste demand, but the core trend remains intact. These companies are benefiting from increased pricing power and cash flow is accelerating. We may witness a brief pause as we adjust to where we generate waste, subsequently shifting collection and associated costs. However, supply remains constrained.
The Breaking Point

As environmental concerns increased, the US sought various sustainable options to reduce waste. In line with this notion, local municipalities across the country implemented recycling programs, which provided another revenue source for many city and state governments, until recently. Demand for our recyclable materials allowed the US to sell recyclables at a greater value than the cost to collect and sort them ourselves. That demand has collapsed and the value of recyclable materials has imploded, calling the whole recycling ecosystem into question.

**Price of Basket of Recycled Materials**

Despite these challenges, we do not expect major US municipalities to cancel recycling programs. Public sentiment and regulators would not stand for it. There are viable solutions, but consumer education will be fundamental to the success of sustainable waste disposal and recycling efforts. In general, waste and consumption must be minimized. That said, demand for recyclable materials must be sufficient for recycling to work, otherwise these materials will be diverted into additional waste disposal.

China Turns Inward

The collapse in recyclable materials demand was largely due to a change in China’s policy toward the import of waste. Previously, China was the recipient of nearly 70% of the world’s recyclable materials, including a significant portion of US recyclables. As China’s economy continued to expand, it no longer needed imported waste to feed its recycling facilities. The rapidly growing and populous country began generating and consuming a significant amount of waste domestically, leading to increased pollution and environmental challenges. To combat these challenges, China notified the World Health Organization (WHO) in 2017 that it would ban the import of 24 types of solid wastes, citing a need to focus on domestic issues including public health and the environment. The cumulative sum of those imports accounted for approximately $5 billion of annual business, representing the sixth largest export to China from the US.¹
In April of 2018, China added an additional 32 types of waste to the banned solid wastes import list. “Sixteen types of solid waste, including compressed car scraps and scrapped ships, will be banned from import beginning Dec 31, 2018” according to China’s Ministry of Ecology and Environment (MEE). The MEE added, “Another sixteen types, including stainless steel scraps, will be banned beginning December 31, 2019.” This decision concluded China's reign as the world’s largest importer of recyclable materials, topping out at 48% of wastepaper and 72% of used plastics.

Over the past 18 to 24 months, China’s ban has severely impacted municipalities as recycling programs across the US began to break.

Manteca, CA
CANCELED EVERYTHING BUT CARDBOARD AND NUMBER 1 & 2 PLASTICS.

San Diego, CA
MEMO TO CITY COUNCIL: REVENUE IN 2017 DROPPED FROM $4 MILLION TO $3 MILLION IN 2018 AND IS PROJECTED TO BECOME A $1.1 MILLION COST.

TUCSON, AZ
REDUCED RECYCLABLE COLLECTION FROM WEEKLY TO BIWEEKLY IN ADDITION TO ADDING A NEW HOTEL TAX TO COMPENSATE FOR THE MISSED REVENUE.

HANNIBAL, MO
NOT ACCEPTING: PLASTICS NUMBERED 3-7 (PRIMARILY FOOD & BEAUTY PRODUCT CONTAINERS.)

BRIDGEPORT, CT
THE CONNECTICUT CONFERENCE OF MUNICIPALITIES TESTIFIED DURING THE 2019 LEGISLATIVE SESSION THAT BRIDGEPORT REVENUES OF $129,000 ARE NOW A $394,000 COST, A MORE THAN $523,000 NEGATIVE BUDGET SWING.

WASHINGTON, D.C.
THE COST OF RECYCLING IS NOW $30 MORE PER TON THAN DISPOSAL, SETTING A DANGEROUS ECONOMIC ALTERNATIVE TO INCREASING LANDFILL DUMPING. PREVIOUSLY, RECYCLING WAS A REVENUE SOURCE FOR THE NATION’S CAPITAL EARNING AS MUCH AS $550,000 IN 2011.
The severity of this issue still remains below the surface for many people in major metropolitan areas able to absorb most of the cost, but not for long. With no sign of slowing demand and extremely limited supply growth, this dynamic will accelerate if we approach scarcity value for disposal.

**The Phases of Commodity Pricing**

We see three phases of commodity pricing, which is largely a function of macro-environmental factors. Since products are indistinguishable across competitors, prices are determined by aggregate supply and demand, as well as storage and transportation considerations.

**NORMAL PRICING**
At “cost” of extraction, processing, small return for company/investors.

- Price recovers cost of:
  - Extraction
  - Processing
- Company & Investor Returns

**CYCLICAL PRICING**
Recovers all the costs of normal pricing, but includes additional transportation cost beyond normal radius.

- Demand exceeds typical supply, products travel further at greater cost
- Price recovers costs plus additional transport:
  - Delivery radius increases and transportation costs increase

**SCARCITY PRICING**
At “opportunity cost” of not consuming. Additional transport radius unable to meet demand.

- Price reflects next best option or lack thereof:
  - Supply is exhausted
  - Rapid price increases (no upward bound)

Currently, prices are governed by landfill capacity, with transportation costs to other facilities creating an upper limit to prices. If a landfill is near capacity, its pricing will converge on the nearest landfill capacity price plus the transportation cost to move it there. Longer hauls for waste disposal mean higher prices if another landfill with capacity is available, if not, and supply tightens further, we may see scarcity pricing.

**Alternate Paths**

Companies have been working to reduce waste and packaging for decades and recycling programs have been in place just as long. As the vast majority of materials reductions are already in place, policymakers are turning to education to help alleviate the burden. But the fact remains—recycling rates have not moved meaningfully for 20 years due to challenges from labor intensity, transport, and the energy required for processing plastics.
As the dynamic from broken recycling compounds a solid waste crisis in certain regions, rocketing disposal prices are forcing us to rethink waste infrastructure. The landfill has traditionally been waste’s backstop, and as recycling costs surge, more streams are headed there. Landfills are a convenient solution for handling waste near term; however, they pose environmental challenges and are not a sustainable alternative. Additionally, they pose capacity concerns as they continuously require additional disposal space. This is most evident in the largest waste market of the country, the Northeast, where we are rapidly nearing landfill capacity.

This dynamic is highlighted by the price acceleration of “tipping fees”—the costs-per-ton charged for disposal. These moved from a historical 1 to 2% as demand increased with population growth and capacity was plentiful. As capacity diminishes and demand from un-diverted recycling increases, tipping fees are rising higher in the region.
While the data is somewhat opaque, if we look at the industry from the bottom up, landfill by landfill, we see why prices have accelerated and why this will likely continue. Data on this topic is limited with the only official statistics available at the state level and must be adjusted for factors such as permit extensions. The below graphs highlight the number of closures in the Northeast since 2012, including planned closures and expansions.

To ease the burden of landfills, we must focus on a more circular economy while exploring disposal alternatives. There are three major alternatives to landfills:

1. **Produce Less Waste**
2. **Increase Recycling**
3. **Incineration**

Producing less waste is the optimal goal, but it will take time and we will never completely be without disposal needs. Recycling is attractive, but current rates are challenged and the economics will remain broken until we develop improved technology or find new markets for recyclables. Finally, incineration is currently Europe’s solution, and it is the most sensible as population densities increase. Incineration reduces the need for vast landfill capacity with the option of also generating electricity where those assets exist.

As the only other alternative to landfills for un-diverted recycling streams, incineration offers various advantages but still has limited emissions and need for disposal. Waste incineration plants reduce multiple tons of waste to significantly fewer pounds of ash for landfills, resulting in a meaningful reduction of disposal volumes over solid waste. In addition, metals are easy to recover after burning thus reducing labor and sorting costs. Finally, they produce fewer greenhouse gases versus open-air landfills as emissions are captured and treated. Not all incineration plants produce power, but some use the heat to generate electricity. We suspect more demand for waste-to-energy is in our intermediate future especially as electrification continues to gain popularity.
However, these waste-to-energy assets come at a steep price point, with some estimates as high as $500 million. Another roadblock to this potential solution is permitting since local residents often oppose the construction of these plants in their communities. This has led to tremendous pricing power for existing incineration companies but investment economics for building new facilities are prohibitive, ultimately driving economic incentives toward landfill disposal and stretching that capacity further.

**Waste-to-Rail Economics**

As we approach capacity issues, microeconomics dictates that the next cheapest alternative will prevail. With landfills nearing capacity, a broken recycling market, and minimal use of incineration, transporting waste out of the market becomes the only outlet. Using our earlier example of the Northeast, waste-to-rail economics act as a ceiling such that any means of disposal in the Northeast should raise prices to the point where it is cheaper for the waste to be railed to another market.

Since the Northeast is bounded by a national border, the great lakes and the Atlantic Ocean, the preferred export route is rail through New York State. The cost to rail a ton of municipal solid waste (MSW) to Albany from NYC is currently over $160, compared with the $60 to $100 range we have found in New England. This suggests that pricing could, and probably will, continue to move toward “rail economics,” a substantial lift to the pricing we have already seen.

**What’s Ahead?**

The supply-demand imbalance is accelerating waste pricing. We expect pricing to continue to climb and potentially accelerate further as more states’ capacity for disposal tightens and challenges to investing in new supply, including costs and rigorous regulatory requirements, persist.

Select states are already feeling the impact of this trend as in-state disposal is unable to meet demand and prices in certain areas of the country have risen above inflation for the first time in the waste industry’s history. Prices began rising between 2016 and 2017 and despite the straight line growth we have seen since, the market does not appear to believe it is sustainable. However, we anticipate more states will encounter similar issues over the next few years, ultimately leading to scarcity pricing for disposal.

Growth rates for EBITDA (operating profit proxy) have nearly doubled since 2015, yet the multiple that investors are willing to pay for these stocks has declined. This would be a logical conclusion if we were expecting an eventual reversion to historical norms from the rapidly improving outlook; however, the evidence indicates otherwise. Future price increases are clearly not being discounted and pricing thus far has not yet reached the bottom line for most companies. Most of the industry operates on contracts averaging five years. This dynamic is only 18 to 24 months old suggesting that should prices stay flat, there will be supported revenue growth for another three plus years. While the pandemic has slowed pricing due to the severity of the economic pullback, we expect leading-edge pricing to continue to march higher as the recovery unfolds, allowing analyst estimates to resume their upward trend.
A More Resilient Future

Environmental stewardship is a challenge that we all increasingly face each day. While carbon fuels and their emissions are a global focus, waste is a far more regional issue with seemingly little coordination and urgency. With the absence of an outlet to sell our discarded recyclables and decreased funds to subsidize their collection and processing, regulators and consumers must contemplate the impact of their consumptive behavior.

While landfill issues are primarily a problem in the Northeast at present, they will serve as a warning, highlighting the economics associated with current consumptive behavior. Painful anecdotes and expensive waste exports to the rest of the country will force consumers and regulators to further evaluate consumption patterns, recycling measures and sustainable long-term solutions.

We are optimistic that economic pricing signals are the most important catalysts to improving behavior, but it will take time to develop viable alternatives to waste-generating consumption. Meanwhile, we see significant opportunity to invest in companies managing this dynamic as their business opportunities grow with the problem. Considering these issues are only prevalent in a handful of geographies, we believe the waste industry’s assets are currently undervalued. We see a number of attractive investment opportunities emerging as the economic impact of the waste crisis broadens across the US and we aim to reduce consumptive behavior.
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Robin is a senior portfolio manager for the Global Natural Resources strategy, which he designed and launched in 2008. He is also a co-portfolio manager of the All-Cap and Diversified Equity strategies, and he is a member of the Global Research team, responsible for providing sustainability and resource insights to the organization. Previously, he served as an energy analyst, and he continues to host the Technical Analysis working group for equities.

Prior to joining the firm in 2006, Robin worked as a research analyst covering basic materials at State Street Global Advisors where he began macro-focused investing in 2003 as part of the company's Global Strategy team. Robin has been in the investment industry since 1999.

Robin earned an MBA and an MSF from the Carroll School of Management at Boston College and a BS from Lehigh University. He holds the CFA® designation and is a member of the CFA Institute and the CFA Society of Boston. He also holds the Chartered Market Technician designation and is a member of the Market Technicians Association.
**Endnotes**


**Disclosure**

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