

The PlastiCity Fund

Our fund address the fundamental challenge of plastic related pollution and related social and environmental issues by focusing on the issue of fragmented plastic recycling economics. Our proposal finances effective, innovative and scalable plastic sorting technologies in the United States, thereby narrowing the gap in unit economics between virgin and recycled plastic and catalyzing the transition of the United States towards a circular plastic economy.

The Problem

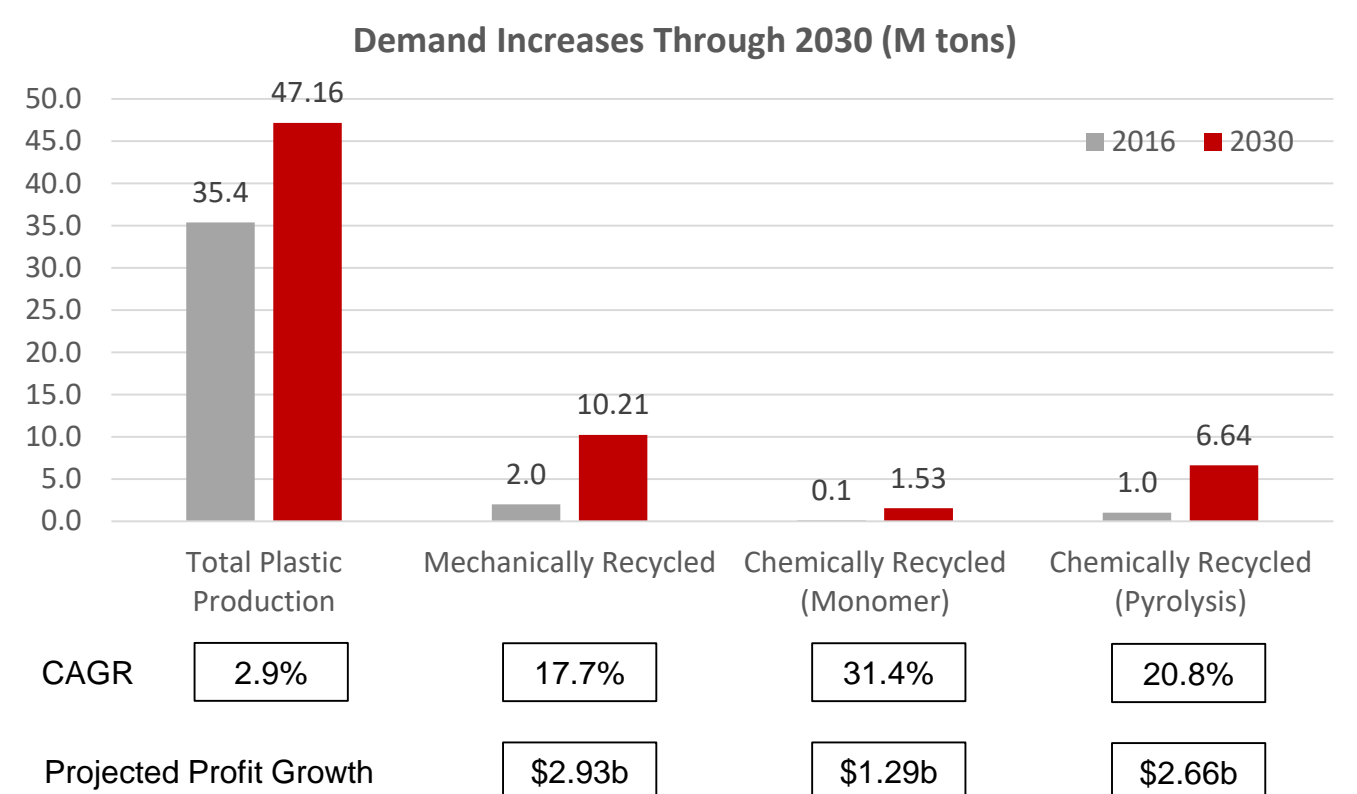
In 2017, the United States produced over 35M tons of plastic waste, only 8.4% of which was recycled, with the remainder either landfilled or burned for fuel. The proportion has declined even further since, due to China's National Sword policy and ban on recycling imports. This has far-reaching environmental implications (CO2 emissions of 3 tons per ton plastic, waste).

This former reliance on broad waste purchasing created an environment in which US Materials Recovery Facilities (MRFs) were not incentivized to invest in or improve their sorting processes.

The current MRF landscape is fragmented and distributed geographically, with roughly 290 MRFs across the country. These MRFs are highly labor intensive, on average employing 27 sorters, contributing to high processing costs relative to its end commodity value. Thin margins at these facilities are a hurdle for financing of capex investments, which presents the opportunity for Plasticity.

The Opportunity

Recent corporate recycled content commitments and new recycling technologies have created downstream demand for recycled plastic that is projected to greatly increase in the coming years, with subsectors seeing CAGRs exceeding 30%. This combination of drivers both grows the market for existing types of plastic and opens new markets for others. However, to meet this demand both the quantity and quality of supply from MRFs need to increase.

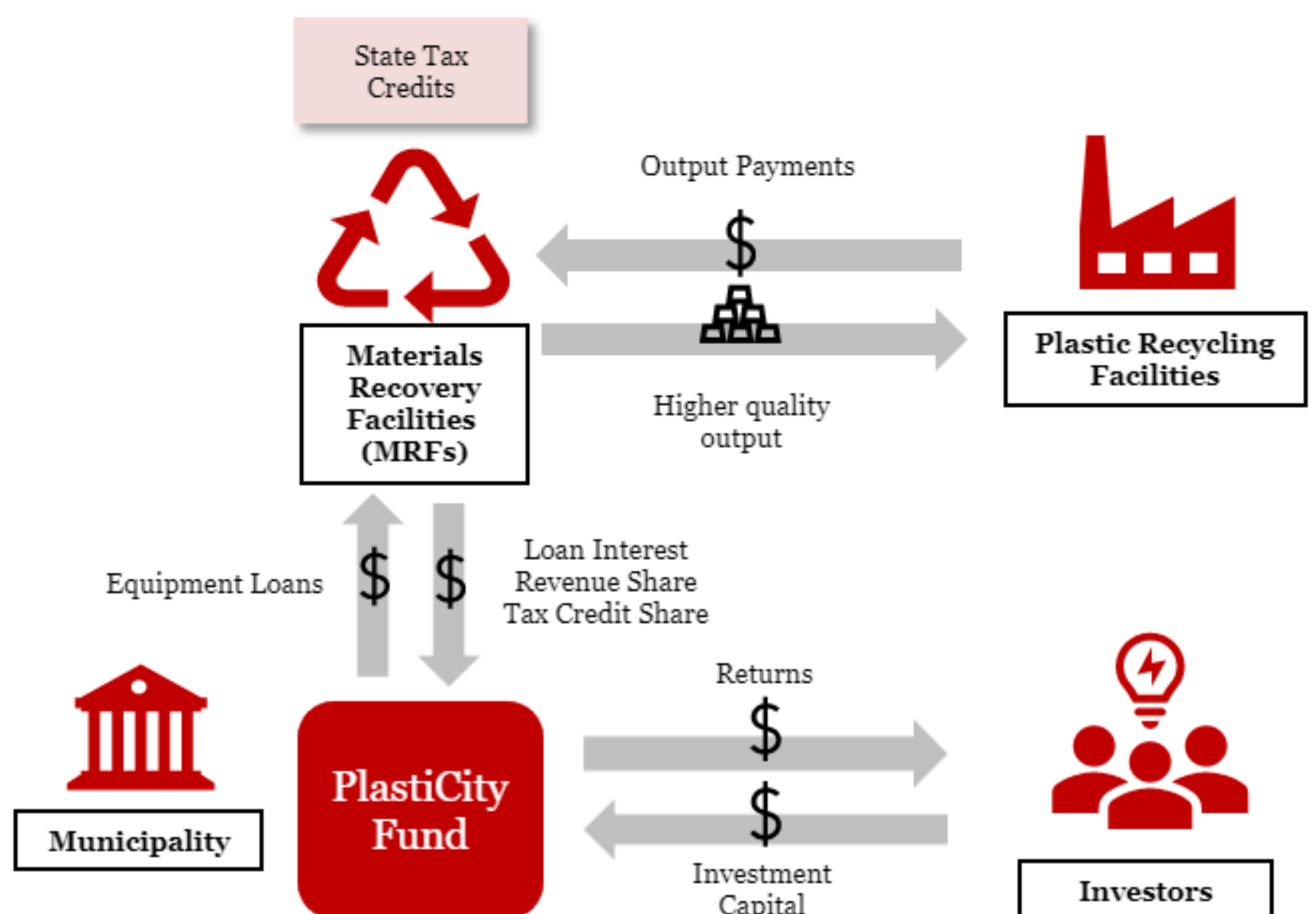


Our Solution

- Our model will lower the cost of capital and encourage investment for MRF sorting equipment by leveraging the municipal bond markets through partnerships with cities, who are a critical part of the recycling landscape.
- The improved machinery will improve the quality & throughput of feedstock that is sent to recycling facilities. These factors combined with increased demand due to the above market forces will drive marked revenue increases for MRFs.

- Diagram to the right shows our proposed investment structure. PlastiCity will raise equity capital from third party investors as well as issuing a municipal bond to contribute capital needed to the MRF for equipment upgrade. Below outlines the anticipated flow of cash and impact:

- **MRF:** receives 10% after tax profit share of incremental profit generated; pass-through of 4% interest to municipal bond
- **PlastiCity/Equity Investors:** receives 90% of after-tax cash flows from MRF and share of tax credits
- **Municipality:** avoided costs of additional waste sorted/recycled via MRF rather than landfilled; improvement of 27ktpa of CO2 emissions for an average MRF improved.



Cash Flows Explained

MRF Capex Expansion - Single Plant Summary

		<u>Pre-Capex</u>	<u>Post-Capex</u>	Δ
Annual Capacity	ktpa	89.4	89.4	0.0
Capacity Efficiency	%	60%	70%	10%
Total Production	ktpa	53.7	62.6	8.9
Average Bundled Sales Price	\$/t	\$45.8	\$55.8	\$10.0
Gate Tipping Fee	\$/t	\$43.0	\$43.0	\$0.0
Total Revenue	\$m	\$4.8	\$6.2	\$1.4
Average Processing Cost	\$/t	\$80.0	\$76.0	(\$4.0)
Total Processing Costs	\$m	\$4.3	\$4.8	\$0.5
Total Profit	\$m	\$0.5	\$1.4	\$1.0
Estimated Capex of Capacity	\$/t			650
Total Capex Cost	\$m			\$5.8
Equity IRR (15-Year Hold)	%			26%

- Table illustrates the impact of capex investment on an average sized MRF assuming an improvement in output quality and volume

Assumptions / Estimations

- Based on recent case studies, we believed an increase of capacity by 10-15% was achievable
- Assumes higher quality plastic sorting, which unlocks premium pricing for HDPE bottles ⁽¹⁾
- We estimated a 5% decrease in unit cost spread over the entire plant given increased efficiency and lower labor costs

Investor Appeal

Capex Cost per Ton

Capacity Efficiency Increase (%)

	\$100	\$200	\$300	\$400	\$500	\$600	\$700	\$800	\$900	\$1,000
5.0%	336.9%	168.0%	111.7%	83.6%	66.6%	55.3%	47.1%	40.8%	35.8%	31.7%
5.5%	309.9%	154.5%	102.7%	76.8%	61.2%	50.7%	43.1%	37.2%	32.5%	28.6%
6.0%	287.3%	143.2%	95.2%	71.2%	56.7%	46.8%	39.7%	34.2%	29.7%	25.9%
6.5%	268.3%	133.7%	88.9%	66.4%	52.8%	43.6%	36.8%	31.5%	27.2%	23.6%
7.0%	251.9%	125.5%	83.4%	62.3%	49.4%	40.7%	34.3%	29.2%	25.0%	21.4%
7.5%	237.8%	118.5%	78.7%	58.7%	46.5%	38.2%	32.0%	27.1%	23.1%	19.5%
8.0%	225.4%	112.3%	74.5%	55.6%	44.0%	36.0%	30.0%	25.3%	21.3%	17.7%
8.5%	214.4%	106.8%	70.9%	52.8%	41.7%	34.0%	28.2%	23.6%	19.6%	16.0%
9.0%	204.7%	101.9%	67.6%	50.3%	39.6%	32.2%	26.6%	22.0%	18.0%	14.3%
9.5%	196.0%	97.6%	64.7%	48.1%	37.8%	30.6%	25.1%	20.5%	16.5%	12.7%
10.0%	188.2%	93.7%	62.1%	46.1%	36.1%	29.1%	23.7%	19.2%	15.1%	11.1%

- The adjacent table highlights equity IRR sensitivity on Capex Cost / ton and expected MRF capacity efficiency increase
- Capex cost/ton likely to be lower for higher capacity increases

Risks and Mitigation

- Expected increase in price for higher quality sorted plastic could not materialize or sustain long-term in the market
 - Given commitments from end-plastic users to source recycled plastic, ideally MRFs would arrange long-term offtake for fixed price product at a premium
- MRF resistance to implementation of new equipment and challenges of integrating technology into existing operations
 - Optic/robotic sorting technology has been relatively proven and would be an efficient supplement to existing labor operations; also providing MRFs a profit share of 10% to incentivize adoption and partnership
- Capex overrun and/or additional labor needed to operate new equipment leading to higher processing costs
 - Based on sensitivity analysis, a \$750/ton capex with 0% cost decrease would still generate double digit equity IRRs; realistically, we would expect lower labor costs given the automation efficiency of the new equipment

Investment Profile

Fund Type	Equipment Financing
Investment Geography	United States
Fund Size	\$20 - \$50 million
Target Leverage	60%
Investment Period	15 years
Fund Life	15 years
Target IRR	20%
Fees	2% management fee / 20% on returns above 20% IRR
Target Investors	Municipal debt and institutional equity
Minimum Investment	\$500,000

Sources

- (1) Plasticsrecycling.org
- (2) Resourcerecycling.com
- (3) EREF
- (4) Closed Loop Partners
- (5) Ellen MacArthur Foundation – New Plastics Economy
- (6) The New Plastics Economy Global Commitment 2019 Progress Report

- (7) Association of Plastic Recyclers
- (8) KPMG – The Plastic Recycling Opportunity