RECYCLING & WASTE MANAGEMENT

OVERVIEW OF A HIGH-IMPACT DRAWDOWN SOLUTION

Recycling can reduce GHG emissions because recycling is often less energy intensive than producing new items. This solution considers increases in recycling at the household level; increases in industrial and commercial recycling; and a focus on increasing paper recycling.

TECHNOLOGY AND MARKET READINESS

The technologies used in Recycling / Waste Management are mature and market ready. According to Project Drawdown®, Europe achieves paper recycling rates as high as 75% and the United States currently achieves paper recycling rates of 66%. Other recyclable materials have commercial and market presence in the United States including plastics (8%), glass (27%), and aluminum (50%) [1].

LOCAL EXPERIENCE AND DATA AVAILABILITY

There are state-level data available (Beck, 2005) on the amount of recyclable waste (paper, plastics and metals), though the data are somewhat dated. There are also more recent U.S.-level data available through the EPA [2]. The City of Atlanta and many other cities in Georgia have active recycling programs. Other organizations, such as the Center for Hard to Recycle Materials (CHARM) highlight innovative partnerships to improve recycling rates by using information provision programs and facilitating the procurement of high-quality recyclable materials. Plastic recycling start-ups such as Nexus LLC demonstrate opportunities for commercialization of plastic recycling in Georgia.

TECHNICALLY ACHIEVABLE GHG REDUCTION POTENTIAL

The GHG reduction potential is high. According to a 2005 municipal solid waste (MSW) composition study by the Georgia Department of Community Affairs (Beck, 2005), Georgians annually throw away approximately 1.9 million tons of paper, 1 million tons of plastics, 0.36 million tons of metal and 0.24 million tons of glass. This study also indicated that Georgia generally lags behind the United States in terms of recycling rates, especially in paper recycling.

Significant energy savings can be achieved by more widespread recycling. For example, one ton of recycled plastic saves approximately 5,800 kWh or energy [2]. Preliminary analysis using assumed current recycling rates equal to the U.S. averages for different recyclable materials and increasing to 65% for plastics, glass and metals and 90% for paperboard by 2030, indicates carbon reduction potential greater than the 1 Mt CO2 threshold.

COST COMPETITIVENESS

This bundle may not be a highly cost-competitive solution, based on global Project Drawdown® estimates. In addition, current market conditions are not necessarily favorable for increased recycling (e.g., abundance of cheap natural gas in the United States has formed an economic barrier against increased plastics recycling). We will explore Georgia-specific cost effectiveness during the next phase of research.

BEYOND CARBON ATTRIBUTES

Co-benefits: Benefits from this solution relate to environmental and public health from the improvement in air quality and water quality associated with waste diversion from landfills. Additional benefits would likely emerge from the creation of jobs associated with expanded/upgraded recycling services [4,5]. Moreover, establishing alternative waste management and recycling programs could create a steady supply of recycled materials that could be used in promoting new business and construction startups, products, and services (for example, the use of recyclable plastics in house insulation or reclaimed fibers in new textiles and clothes). This could foster the creation of new local economies for recycled/reclaimed products, that would promote jobs and local economic development [6].

Co-costs: There are concerns relating to the siting of additional recycling facilities which may be disproportionately located in low-income communities, negatively impacting air quality and in turn would negatively impact property values in those areas [7].

References:

EPA National Overview: Facts and Figures on Materials, Wastes and Recycling. Available online at: https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials#R&Ctrends

R. W. Beck (2005). Georgia Statewide Waste Characterization Study – Final Report. Prepared for Georgia Department of Community Affairs.

Endnotes:

1. EPA National Overview: Facts and Figures on Materials, Wastes and Recycling. Available online at: https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials#R&Ctrends
2. Stanford University – Land, Buildings & Real Estate. Frequently Asked Questions: Benefits of Recycling. Available online at: https://lbre.stanford.edu/pssistanford-recycling/frequently-asked-questions/frequently-asked-questions-benefits-recycling
3. https://www.drawdown.org/solutions
4. Renewable Resources Co. (2016, December 19). Advantages & Disadvantages of Recycling. Retrieved from Renewable Resources Coalition: https://www.renewableresourcescoalition.org/recycling-advantages-disadvantages/
5. Boulder County. (2020). Reduce, Reuse, Recycle. Retrieved from Boulder County Website: https://www.bouldercounty.org/environment/recycle/reduce-reuse-recycle/
6. https://www.citymetric.com/skylines/9-building-materials-made-entirely-waste-products-932
7. Chow, C. (2019, March 22). Introduce Incentives to Reduce Waste. Retrieved from The Straits Times Website: https://www.straitstimes.com/forum/letters-in-print/introduce-incentives-to-reduce-waste

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