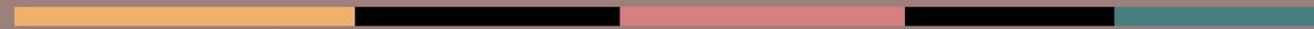


**DRAWDOWN  
GA**

# Recycling: A high impact solution for reducing carbon emissions in Georgia



# Recycling

- Recycling is less energy intensive than producing new materials
- Cans made from recycled aluminum use up to 95% less energy than newly made cans
- Recycling paper, plastics, glass, and metals can reduce GHG emissions
- Paper is the most important material for Georgia
  - \$13.1b paper and pulp industry
  - 20,000 Georgia jobs
  - \$1.8b in annual wages and salaries



# Potential for Carbon Reduction Estimation

## Market penetration scenarios:

1. **Achievable potential:** estimated considering a scenario where 25% (low-achievable) or 50% (high-achievable) of the currently disposed paper, plastics, metals and glass are recycled instead by 2030. Overall recycling rate of about 13% (low-achievable) or 20% (high-achievable).
2. **Technical potential:** estimated considering that 95% of the currently disposed paper, plastics, metals and glass are recycled instead by 2030.

## Methodology:

1. Data from EPA's Waste Reduction Model (WARM) used to calculate energy and CO2 savings
2. Georgia's waste and recycling trends are unclear, so business as usual from 2005 was used
3. Chose achievable potential recycling rates based on realized rates of neighboring TN and SC
4. Used a range of achievable potential to reflect uncertainty of commodity prices and program costs

# Private Costs and Benefits Estimation - Achievable Potential

## Assumptions

- Municipal recycling programs face large upfront costs, but low marginal costs
- A \$1 per-household increase on spending for recycling information programs can increase recycling rates by 1-3% - cost to achieve 20% recycling is \$5-\$14 per household
- Landfilling is cheaper than recycling due to China's National Sword and material quality issues
- Existing recycling programs have fixed costs, and there is little need to start new programs
- Economic benefit can be gained from increasing quantity and quality of recycling - behavioral
- Private benefits based on avoided MSW tipping fees, resale value of recyclables, and cost of avoided generation

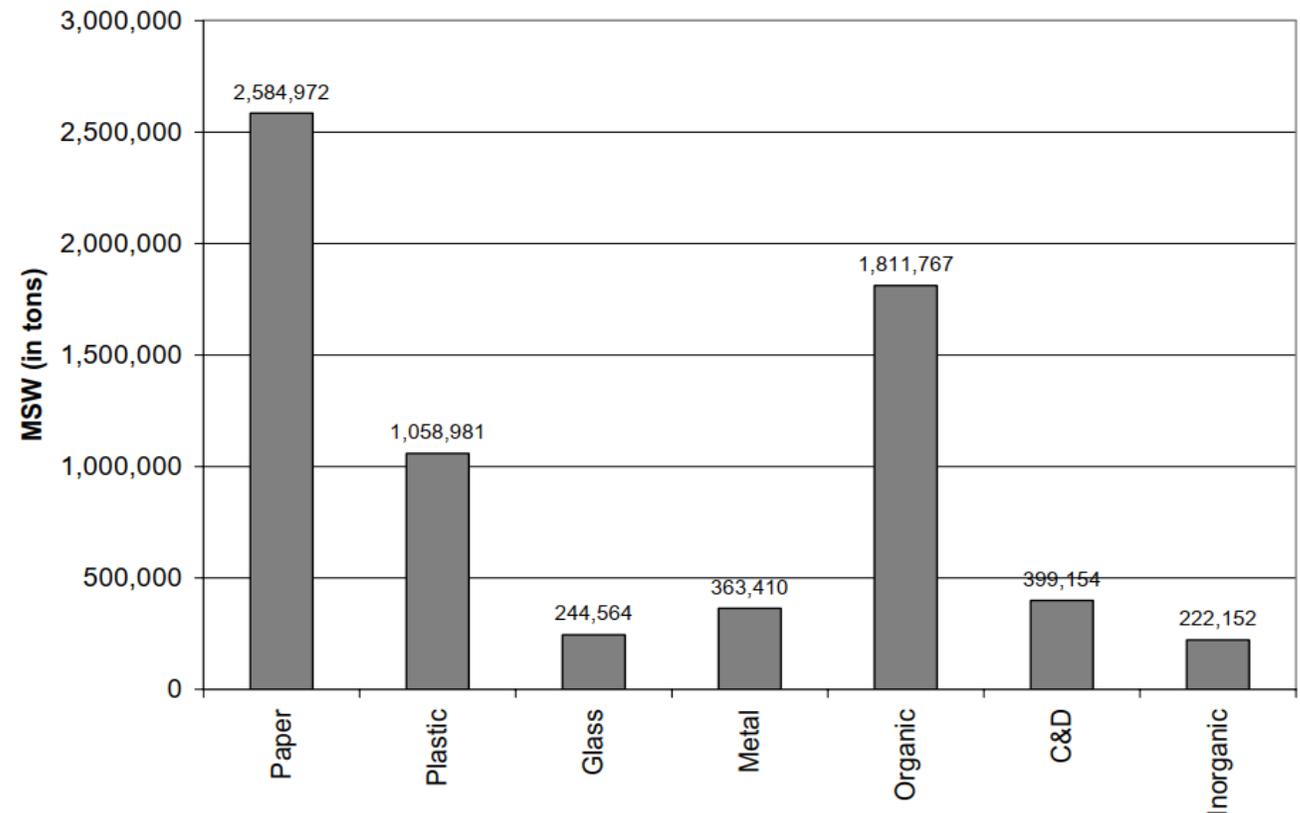
## Results

PV Private Costs	PV Private Benefits
\$21M - \$59M	\$104M - \$147M

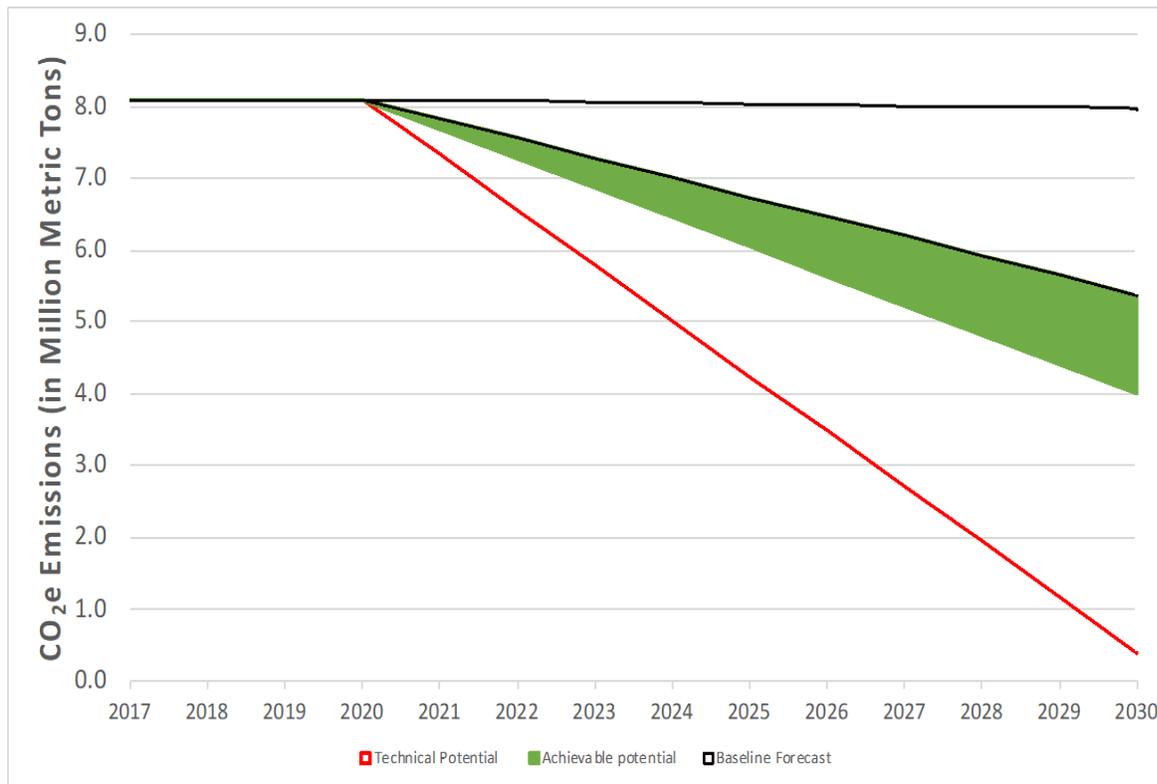
# Current State of Recycling in Georgia

- Great potential to improve paper and plastic recycling
- Impossible to verify quantities of industrial waste
- Columbia University claimed Georgia's overall recycling rate was only 6.6% - far below U.S. average of 22.6%
- Waste management and recycling data are outdated and highly uncertain

Statewide Aggregate MSW Tons Disposed  
Georgia Statewide Waste Characterization Study (2005)



# Recycling Drawdown potential in Georgia in 2030



**1 MtCO<sub>2</sub>e solution** in 2030 = improving waste management practices such that approximately 20% of the currently disposed paper products are recycled.

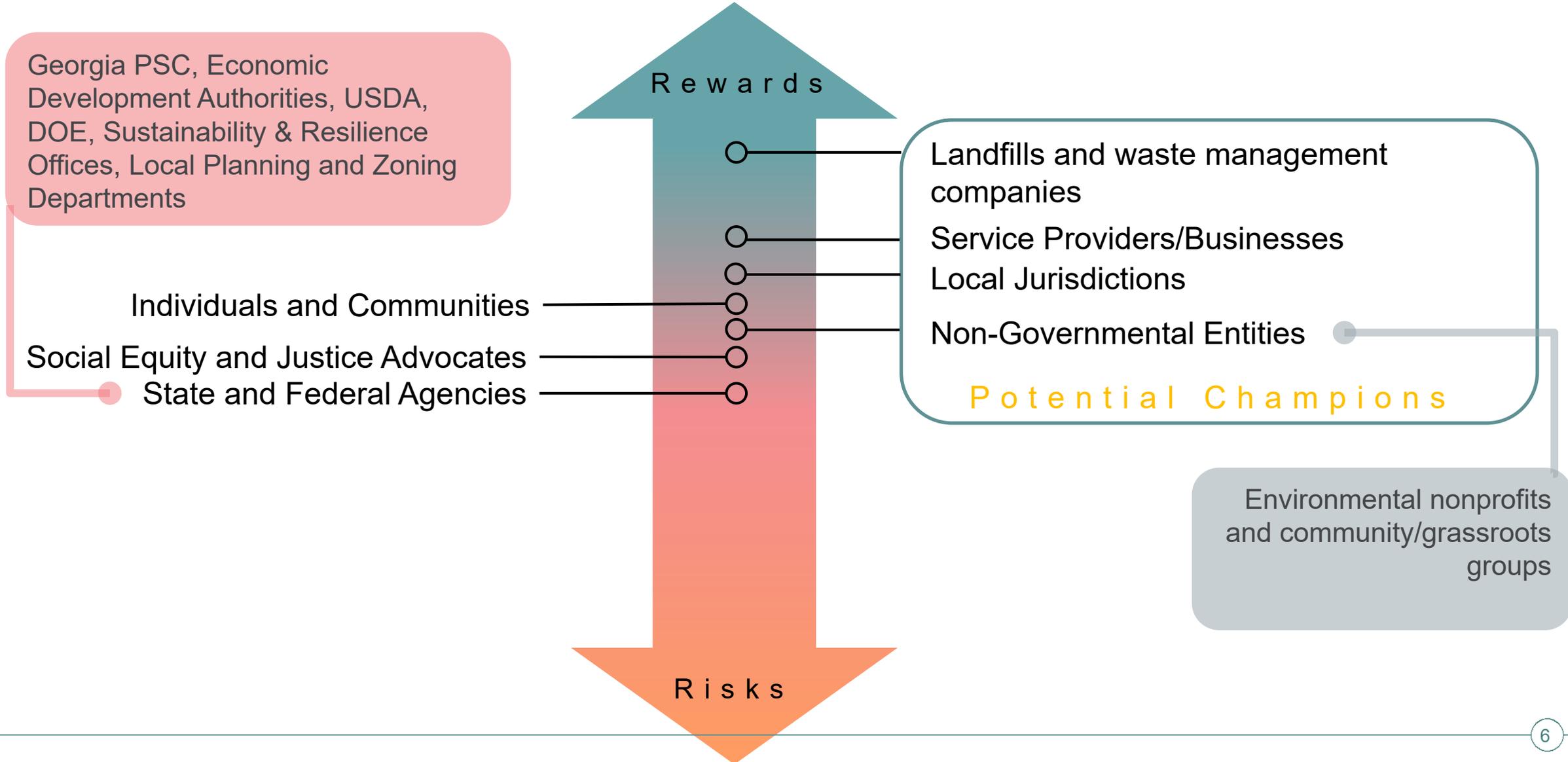
**Baseline** = Total potential emissions to be reclaimed from recycling are estimated to be 8.1 MtCO<sub>2</sub>e in GA in 2030.

**Achievable Potential** = Reduction of 2-4.1 MtCO<sub>2</sub>e in 2030, considering a scenario where 25-50% of the currently disposed paper, plastics, metals and glass are recycled instead, reaching an overall recycling rate of about 13-20% by 2030.

**Technical Potential** = Reduction of 7.7 MtCO<sub>2</sub>e in 2030, considering that 95% of the currently disposed paper, plastics, metals and glass are recycled instead by 2030.

- +Less air pollution
- +Public health benefits
- High recycling costs

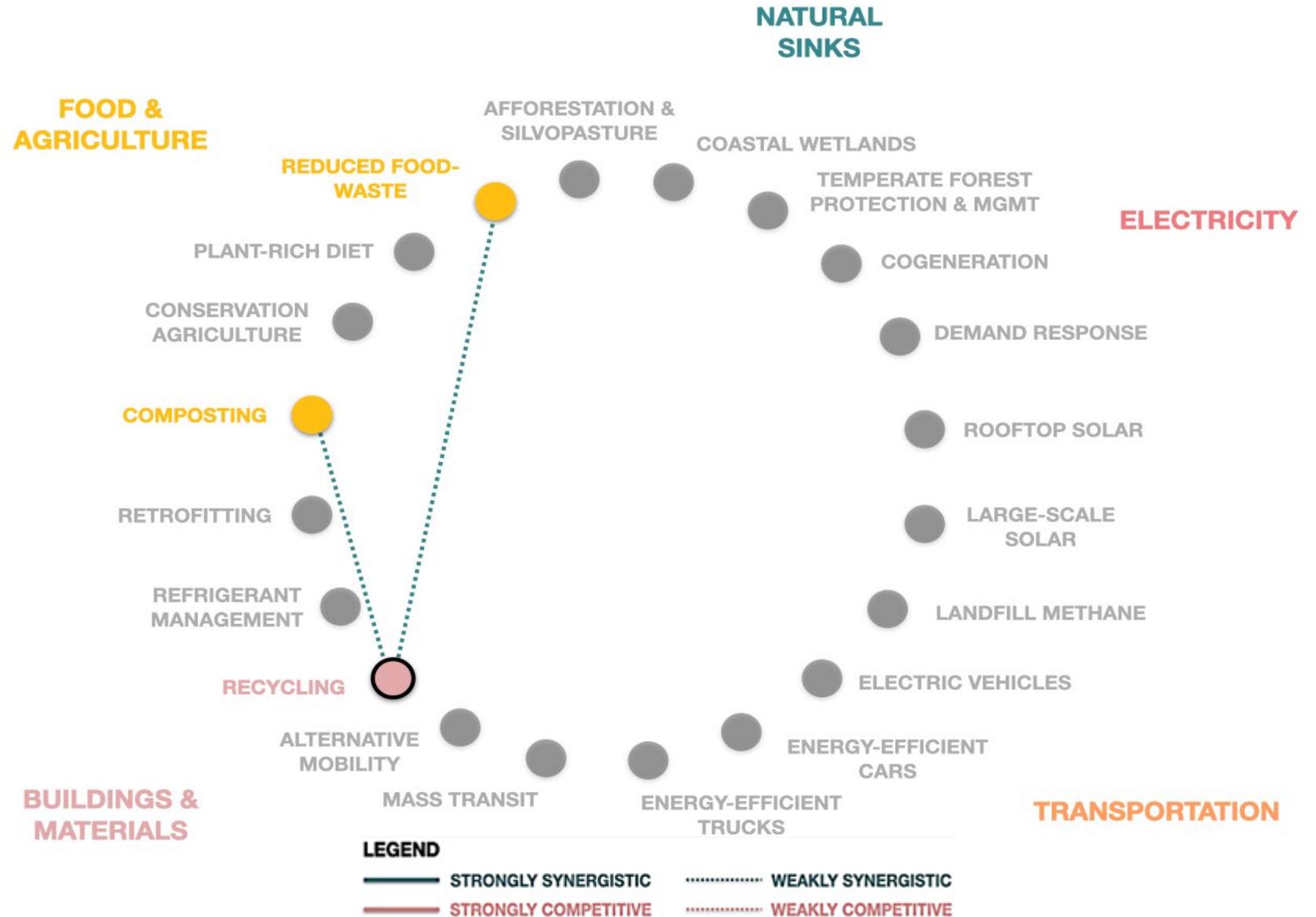
# Stakeholder Analysis of Recycling



# Interactions with other solutions

## Composting and Reduced Food-Waste

- The implementation of recycling policies can enhance other waste management strategies like composting and reduce food waste.



# Other considerations

## Challenges

- Price of petrochemicals
- Cost of recycled vs. newly made materials
- Cost of infrastructure to promote recycling
- Wishful recycling
- Cost of information programs to reduce information asymmetries and reduce feedstock contamination due to wishful recycling

## Promising Policies

- Statewide adoption of a circular economy plan for materials reuse, providing separate collection for recyclable materials to reduce feedstock contamination.
- Information programs to increase participation rates and better educate consumers about what is recyclable and what is not.
- Widespread adoption of “Pay-As-You-Throw” type incentive-based programs
- Financial tools to encourage citizens to recycle more.



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