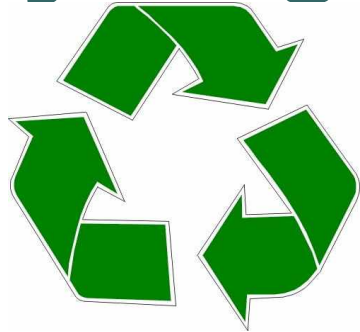


# Experience & Data from Recycling/Reuse in Colorado



Colorado Department  
of Public Health  
and Environment

Wolf Kray  
2008 SWANA Conference  
Golden, CO

# Background

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- **HB 07-1288**
  - Solid Waste User Fee
  - Creates Recycling Resources Economic Opportunity Fund / Program
    - 12 recycling grants totaling 1.3 million
  - Adds 2 FTE at Colorado Department of Public Health & Environment
    - Data collection on recycling & waste diversion

## **State of Recycling in CO**

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- CO in the past: 13<sup>th</sup> lowest recycling rate
- 2005 recycling rate 12.5%
- Low recycling rate is a trend of the Rocky Mountain region with the lowest national avg. at 14%

# Objectives

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- Who's recycling in CO? – create statewide inventory
- Establishing a state recycling rate & recovery rate
- Research material flow & markets in CO
- Track and measure the benefits of recycling

# The quest begins

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- Capturing the recycling universe
  - Prior to January '08: around 30 recyclers identified
  - By February '08: over 280 recyclers identified in Colorado
    - Includes entire recycling universe (haulers, processors, end users, drop off centers, nonprofits, brokers, retail collectors/ take back programs, etc.)
  - 64 of the operations qualifying as recycling facilities requiring the submittal of annual facility reports under current regulations

# Data Collection- Annual Recycling Report

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- **Reporting Requirements-**
- Under 6 CCR 1007-2 Section 8 of the Colorado Regulations Pertaining to Solid Waste Sites and Facilities, recycling facilities must register with the Department and report annually to the Department on or before May 1st of each year, reporting on their recycling activities of the previous calendar year. A recycling facility must be able to show that the quantity of recyclable materials that were recycled during the calendar year was at least 75% of the recyclable material in inventory on a 3 year rolling average.
- Exemptions: drop-off sites, recycling onsite only, automotive / scrap metal

# Methodology

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- Revision of reporting form
  - Prevents double counting
  - Captures material flow
- Material Classification
  - EPA MSW guidelines for Recycling Rate
  - “Other Materials” recycled, reused, composted classified in State Recovery Rate

## Material Classification

<b>MSW Recyclable Materials (MSW recycling rate)</b>	<b>Non-MSW Materials (included in recovery rate)</b>
Paper (includes cardboard)	Aggregates
Plastic	Oil
Glass	Construction & Demolition
Metals (non-ferrous and ferrous scrap metals)	Compost (non-MSW feedstock)
Electronics	Antifreeze
Organics (includes yard waste and composted food scraps)	
Batteries	
Tires	
Commingled	
Other (includes items such as textiles, cooking oil, and small quantities of additional recycled materials)	

# RECYCLING FACILITY ANNUAL REPORTING FORM – CALENDAR YEAR 2007

Material: PAPER Unit of Measure (required): \_\_\_\_\_

Include such items as office paper, magazines, newspaper, phone books, paperboard, etc. Do not include corrugated cardboard.

Type of Activity (Please check all that apply):  Collection  Separation  Other Processing

## 1. INVENTORY

Inventory at Beginning of Year <sup>1</sup>	Total Amount Received (2a + 2b + 2c)	Total Used by Facility Onsite	Total Sent Offsite (3a + 3b)	Inventory at End of Year (1a+1b) - (1c+1d)
a	b	c	d	
_____	_____	_____	_____	_____

<sup>1</sup> Inventory at beginning of calendar year 2007 should equal inventory at end of calendar year 2006

## 2. AMOUNT RECEIVED (Be as specific as possible)

Source Name	City/County	State	Source (List approximate QUANTITY from each)		
			Residential	Commercial	Mixed
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
<b>Totals</b>			a	b	c

## 3. AMOUNT SENT OFFSITE (Be as specific as possible)

Note: If you have a product that comes in as one material and is sent out as another (e.g., a computer monitor received as electronics that is processed at your facility into glass and metal), please list the incoming recyclable material under material collected and then list the outgoing material under the new material category sent offsite for direct use as a product or for further processing.

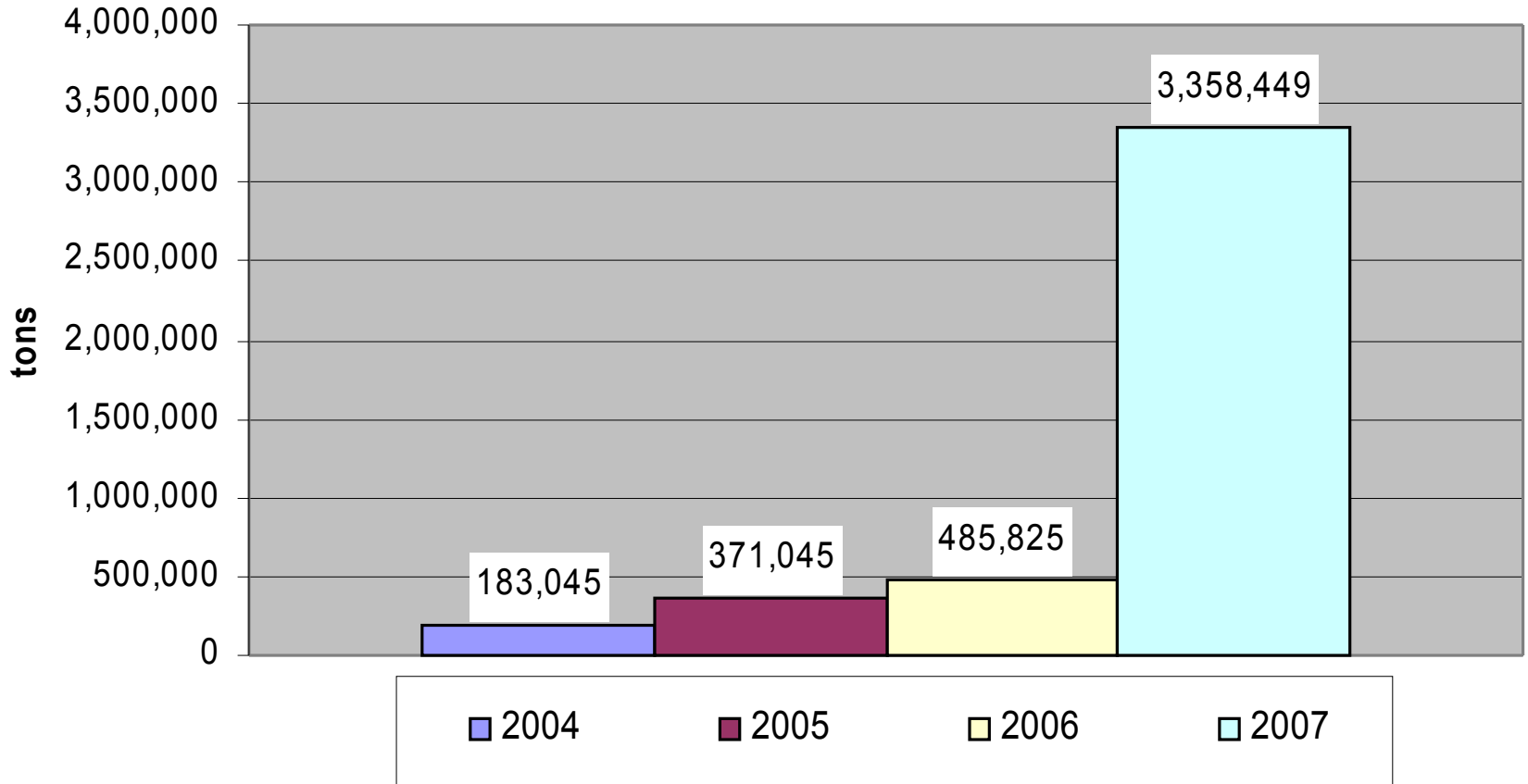
Destination Name	City/County	State	Amount Sent as Product	Amount Sent for Further Processing
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
<b>Totals</b>			a	b

## Results

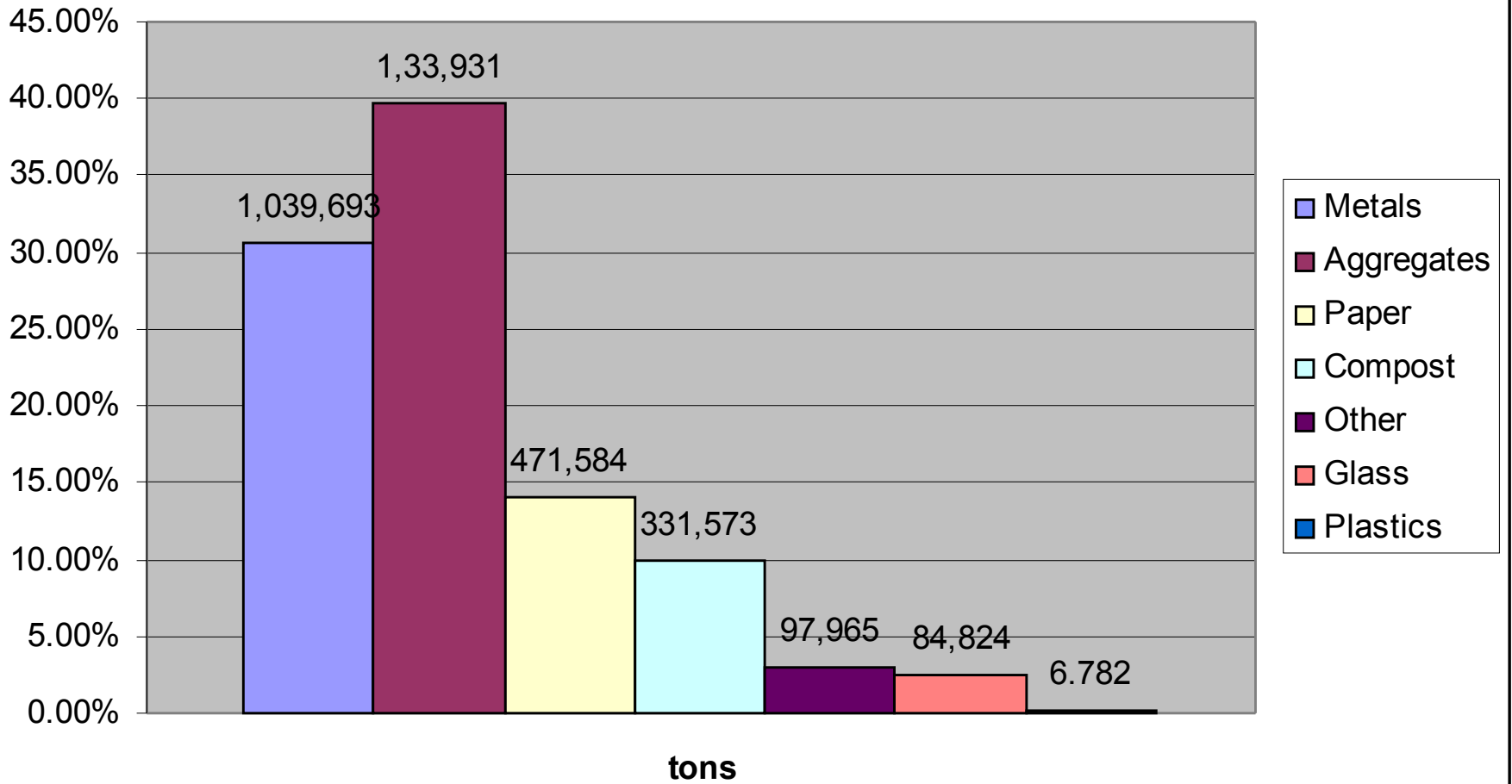
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- For 2007, 3,358,449 tons of material was recycled / recovered
- 84% increase of the previous year
- To remain consistent with the US EPA's measurement standards and to allow for comparisons to other states, recyclable materials shall be broken down into two categories to better analyze and classify recycling rates

**Total Recycled/ Recovered in Colorado  
CDPHE Data  
2004 - 2007**



## Percentage Breakdown of Total Recovered Materials for 2007

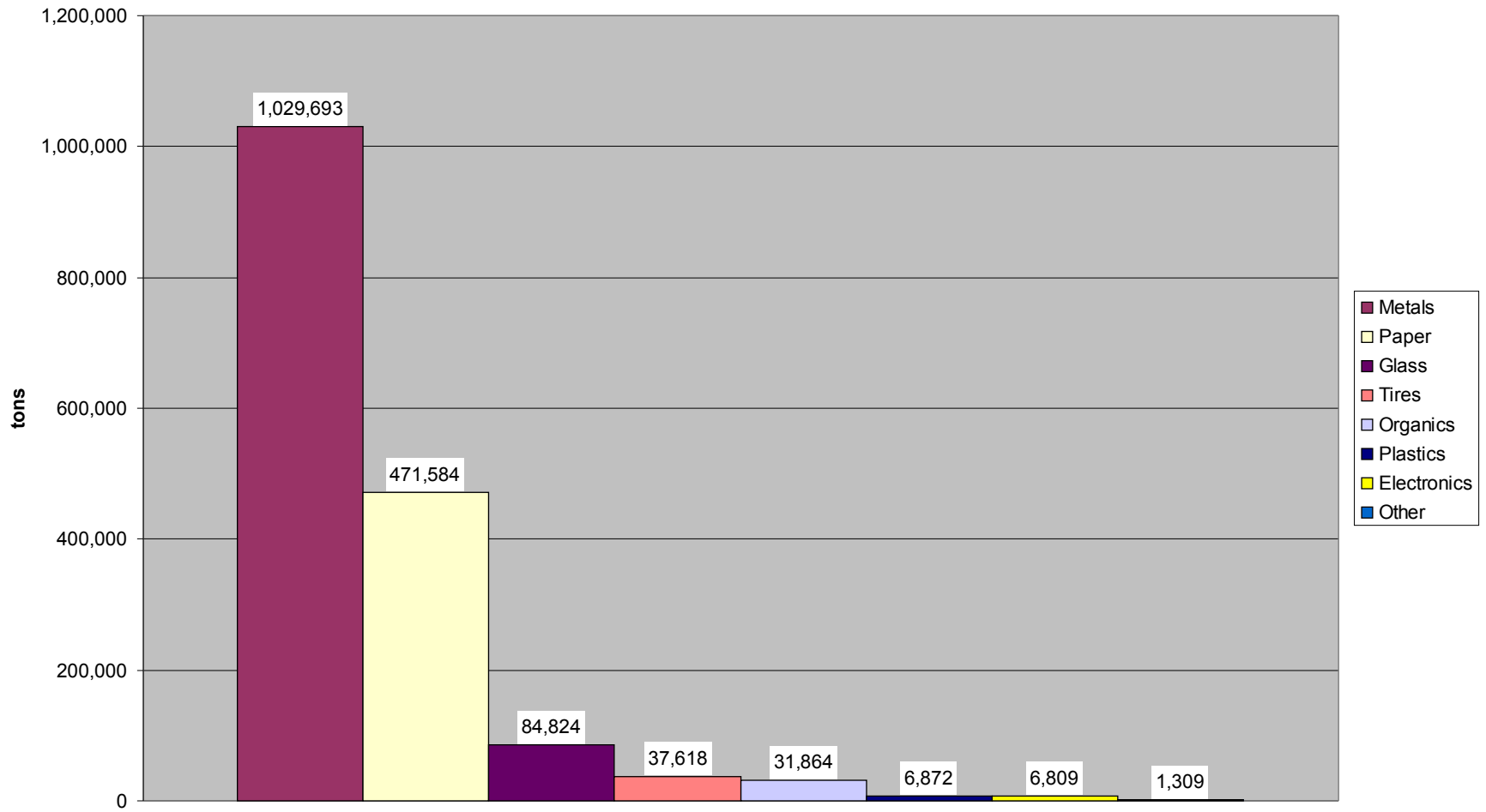


## **2007 Recycling Rate**

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- **Colorado's MSW recycling rate for 2007 totaled 16.6%**
- **(2006 national avg. 32.5%)**
- **1.67 million tons recycled**
- **8.42 million tons disposed in landfills.**

**Figure 2**  
**MSW Recycled Materials**

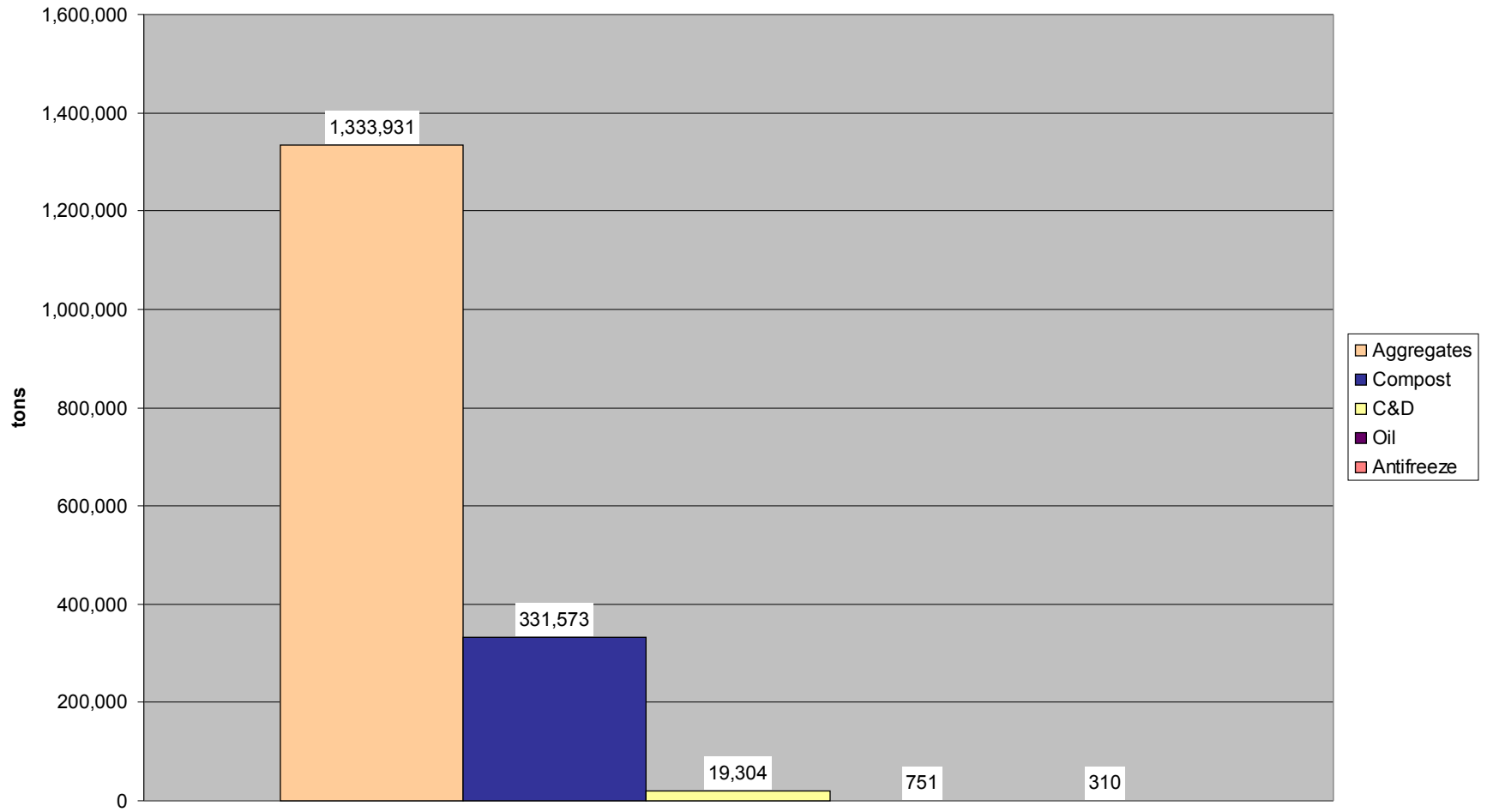


## Recovery Rate

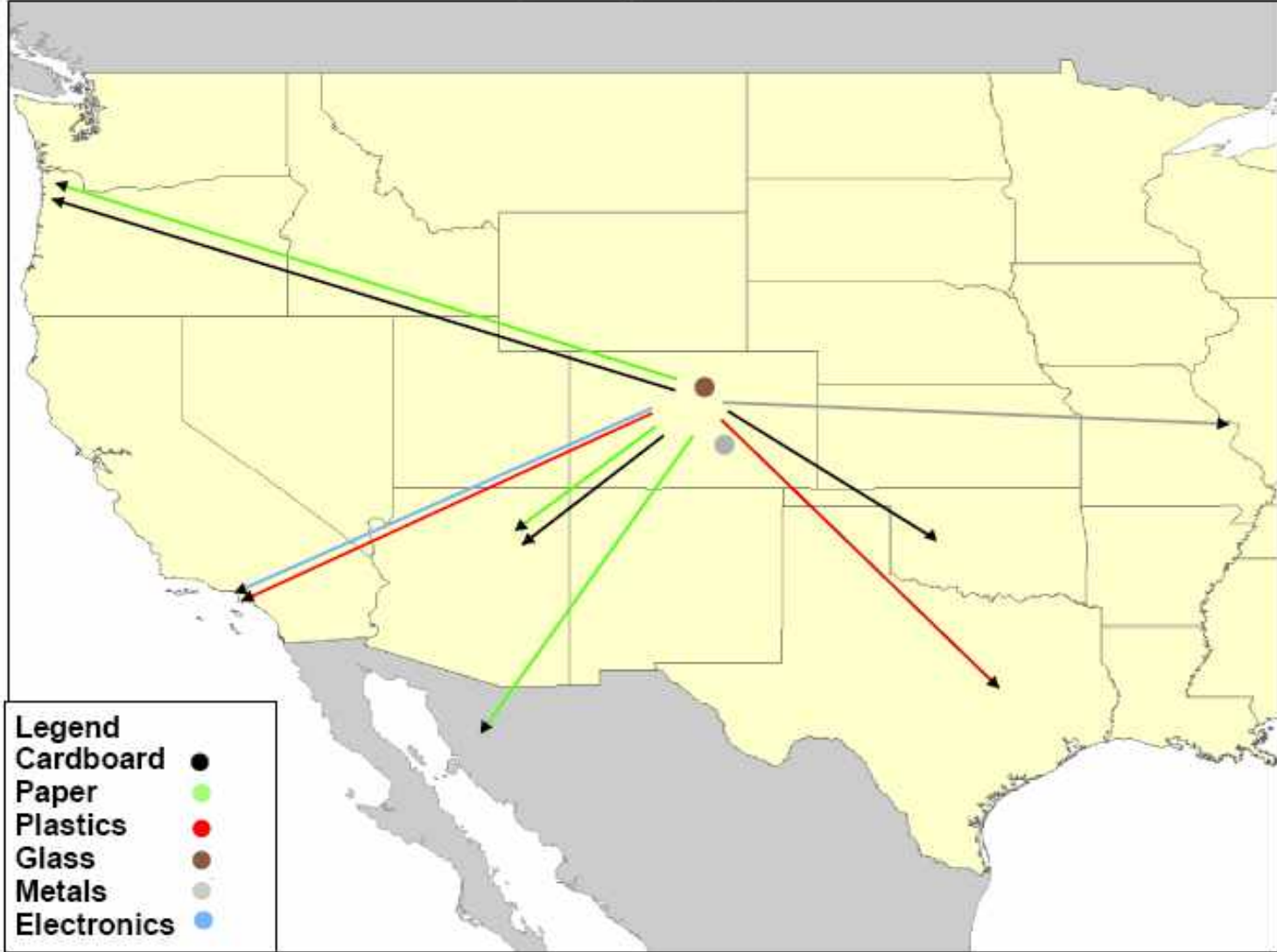
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- Colorado's Recovery Rate for 2007 totals 28.5%
- 3,358,449 tons recovered
- 8,418,721 tons disposed

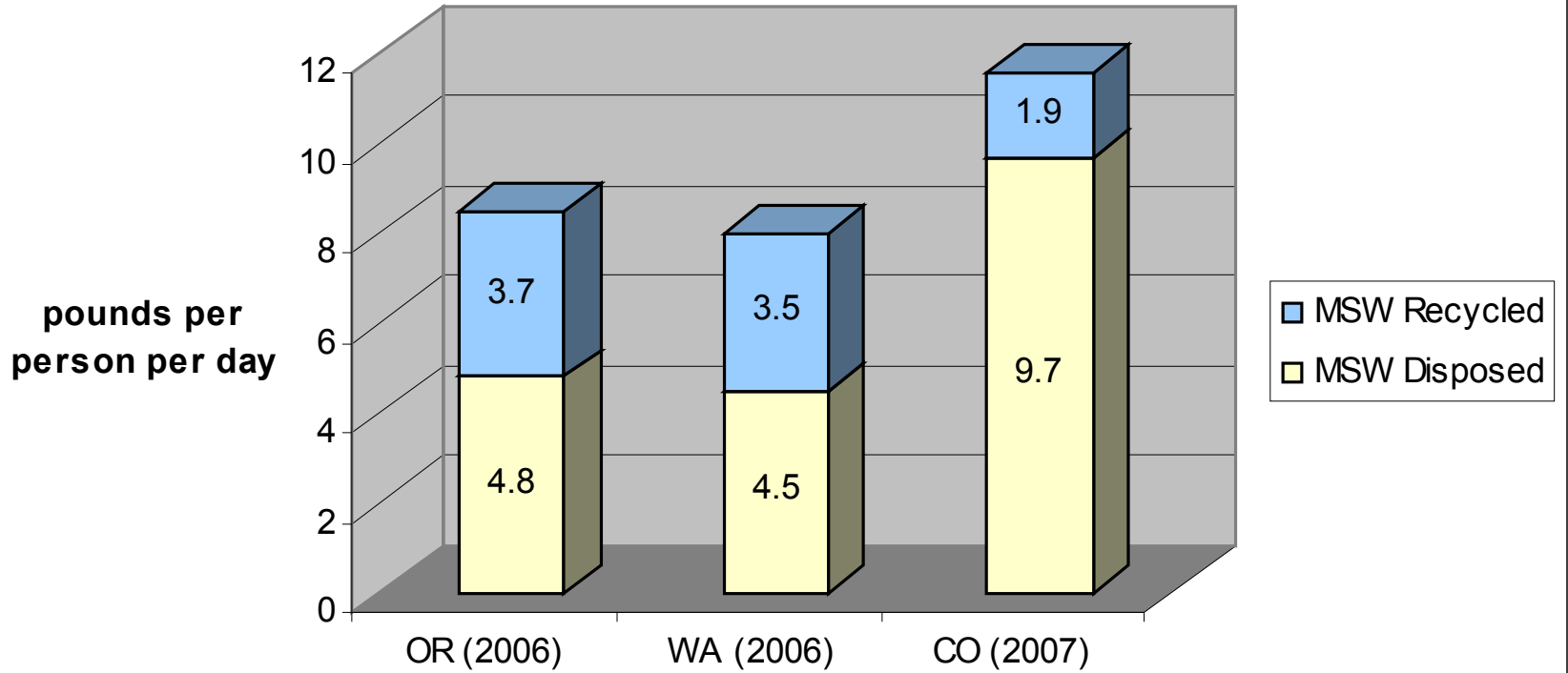
**Figure 3**  
**Other Recycled Materials**



# Primary Recycling Markets



## State Per Capita Rates

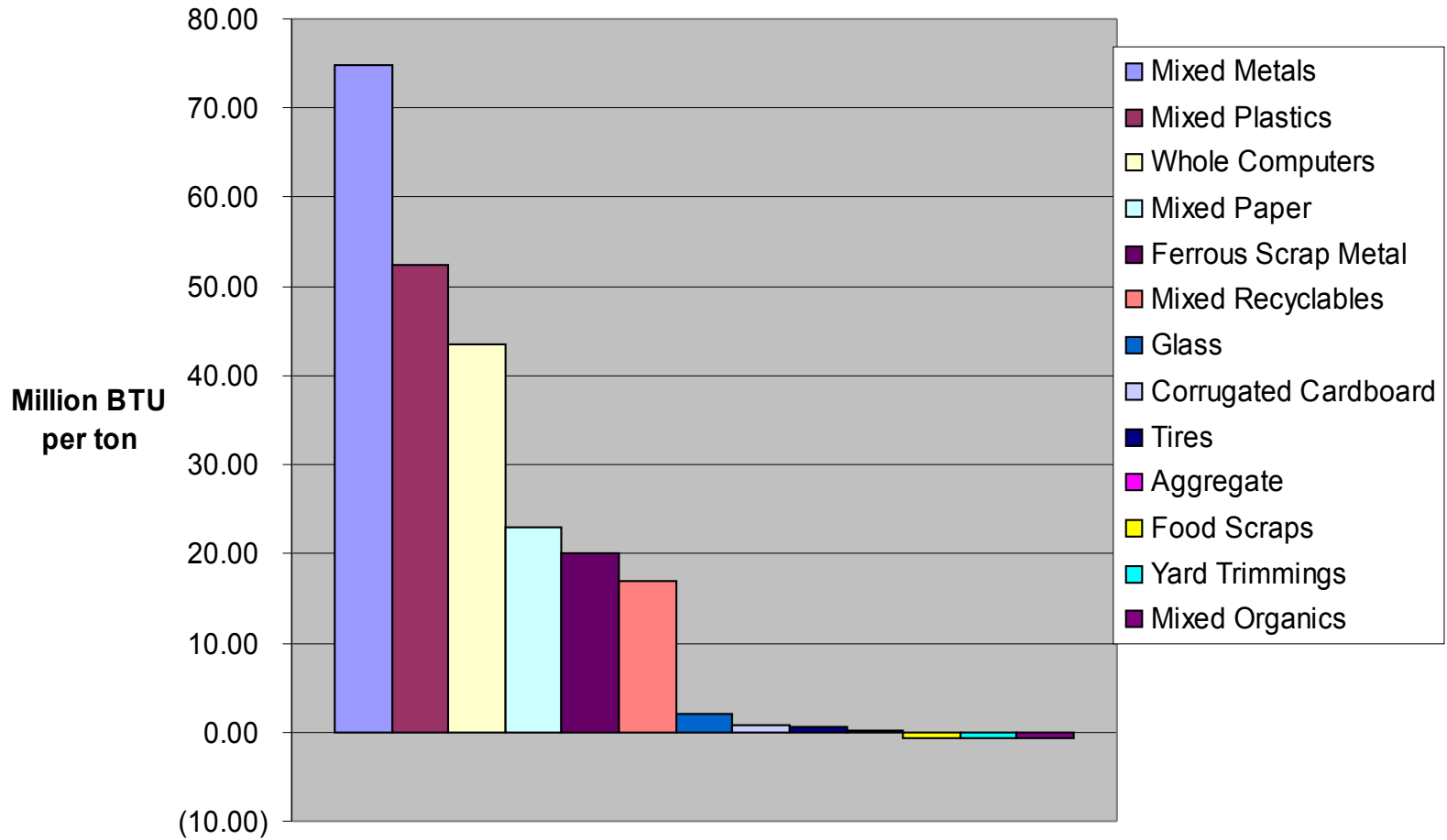


# Recycling Metrics

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- What does 3.36 million tons recycled equate to?
- Energy Savings
  - NERC energy saving calculator
- Greenhouse Gas Savings
  - Waste Reduction Model (WaRM)

## Energy Savings per Material from Recycling & Composting



# Energy Savings Results

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- In 2007, recycling in Colorado saved enough energy to run over 341,000 average homes for a year; 194,000 of the homes being from metal recycling
- Savings equivalent of conserving over 6 million barrels of oil or 285 million gallons of gasoline

# GHG savings

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- In addition to saving energy, recycling is a significantly beneficial action by reducing greenhouse gas (GHG) emissions
- Total avoided greenhouse gas emissions from recycling and composting for 2007 total 2,605,736 metric tons of carbon dioxide equivalent (MTCO<sub>2</sub>E). (WaRM model)

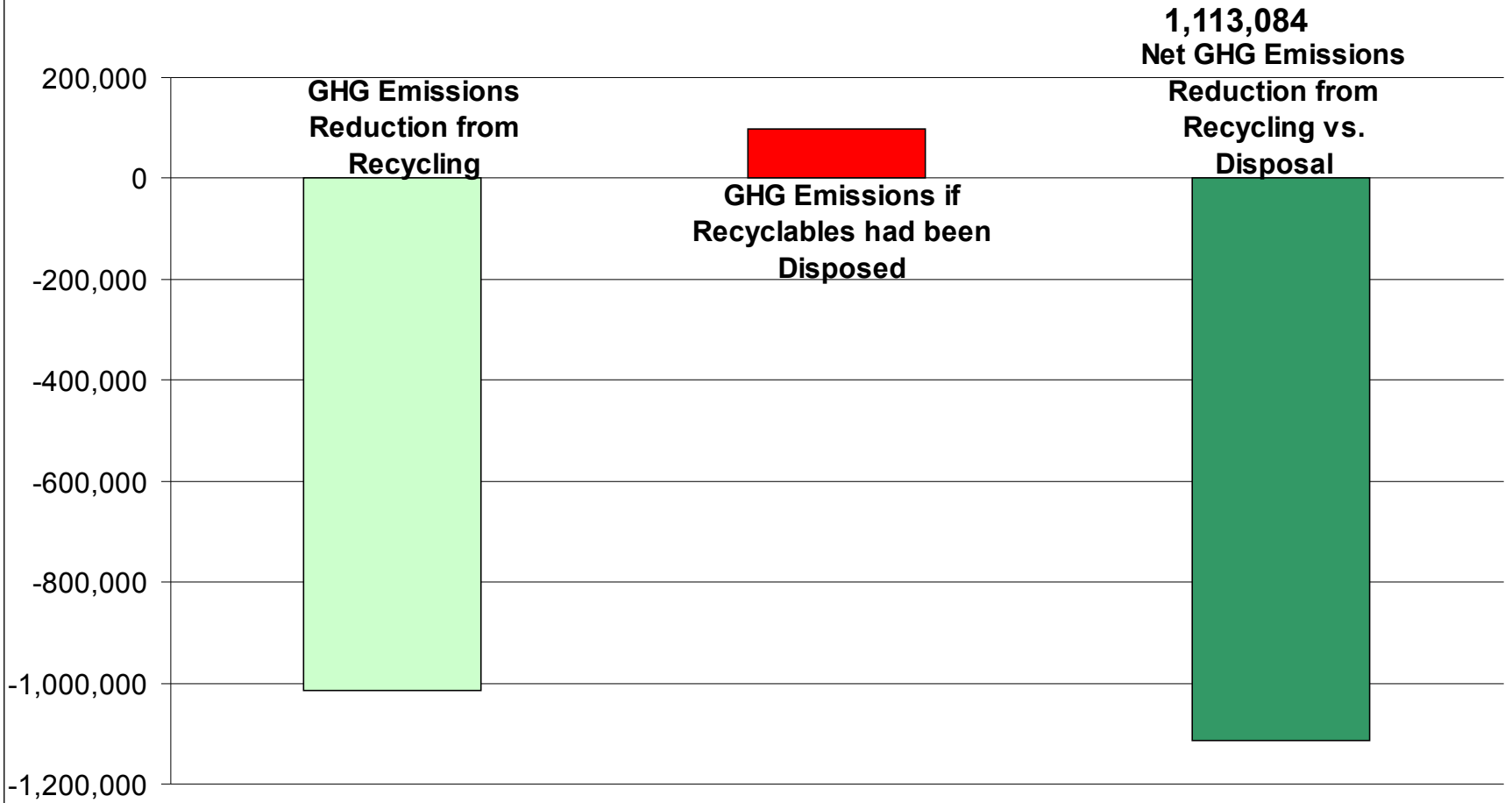
2.6 million metric tons of CO<sub>2</sub>E emissions prevented from recycling for 2007 equals:

**511,000 cars removed from the road / year**

**6.06 million barrels of oil conserved / year**

**13,607 railcars worth of coal avoided / year  
(124 trains)**

## Results of 2007 Recycling Compared to Disposal on GHG (MTCE/Year)

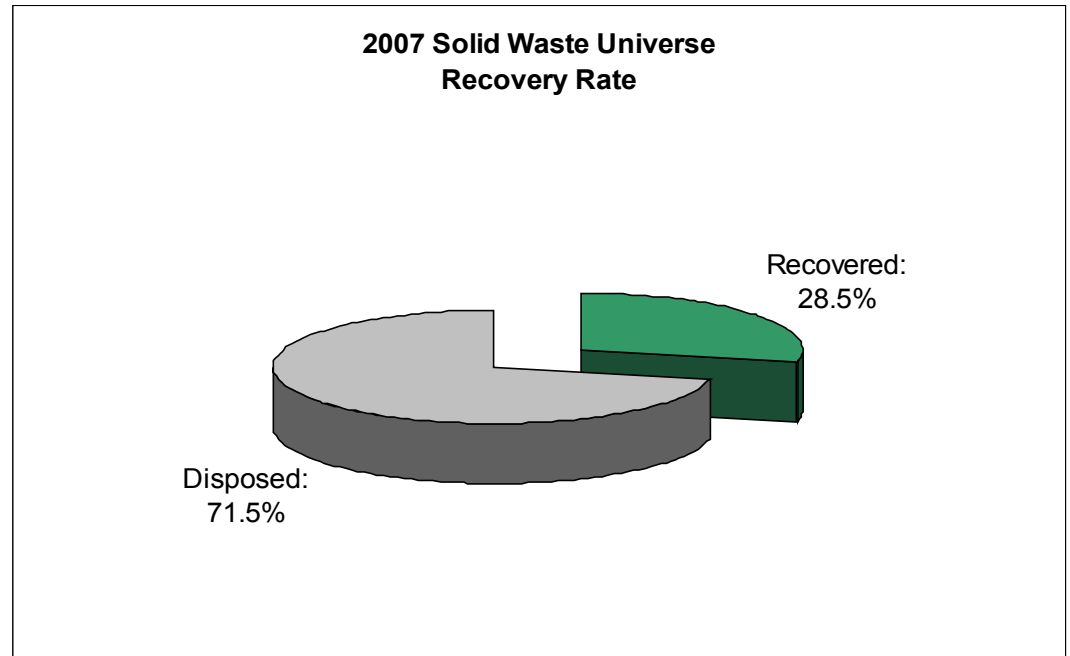


NERC Reductions in Greenhouse Gas Emissions as a Result of Recycling

# Colorado Totals for 2007

<b>MSW Recycled</b>	<b>1,672,580 tons</b>
<b>Total Recovered</b> (includes MSW & Other)	<b>3,358,449 tons</b>
<b>Total Disposed</b>	<b>8,418,721 tons</b>

<b>MSW Recycling Rate</b>	<b>16.8%</b>
<b>Recovery Rate</b>	<b>28.5%</b>



## 2007 Totals

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- Total recovery rate for 2007 resulted as 28.5%, diverting 3,358,449 tons of material.
- Colorado recycling rate totaled 16.6% of the municipal waste generated in 2007.
- Recycling for the year managed reduce greenhouse gas emissions an equivalent of taking approximately 511,000 average passenger cars off the road and conserve enough energy to power 341,000 homes.

# Thank You

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