

# The Green Economy:

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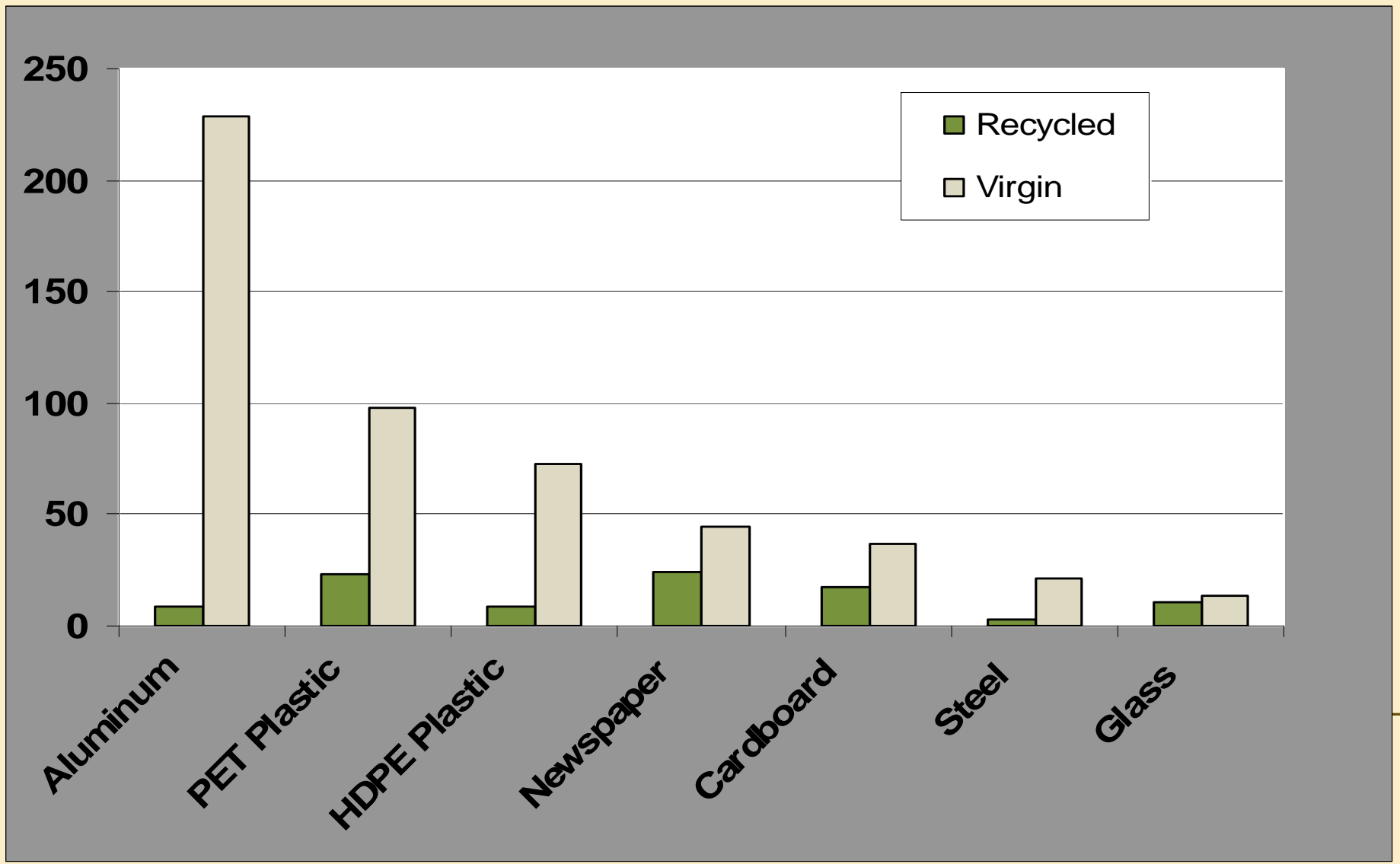
## 3 Rs vs. 2 Ds Reduce, Reuse, Recycle vs. Dump, Destroy

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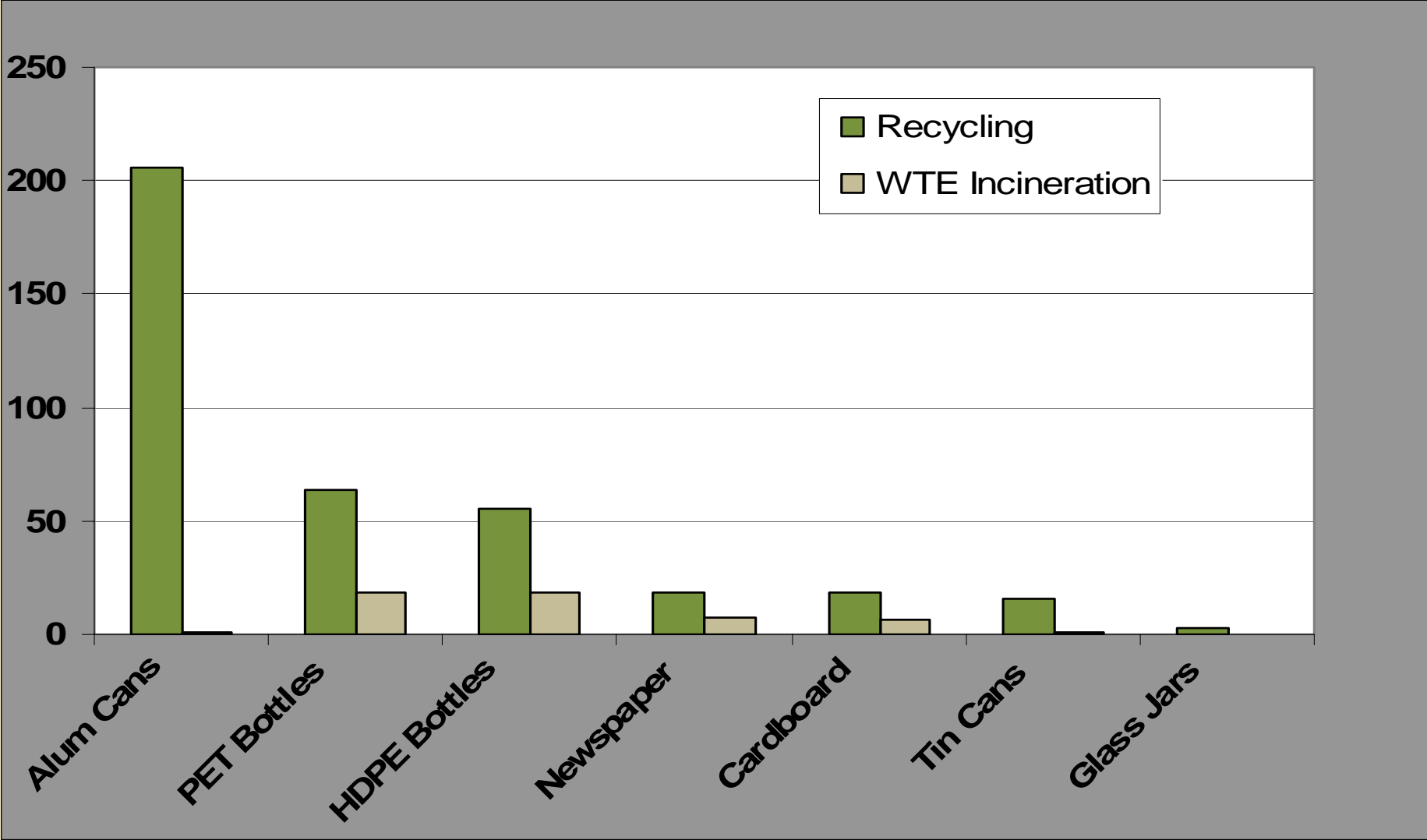
ECONomics: The Green Economy Summit by RCBC

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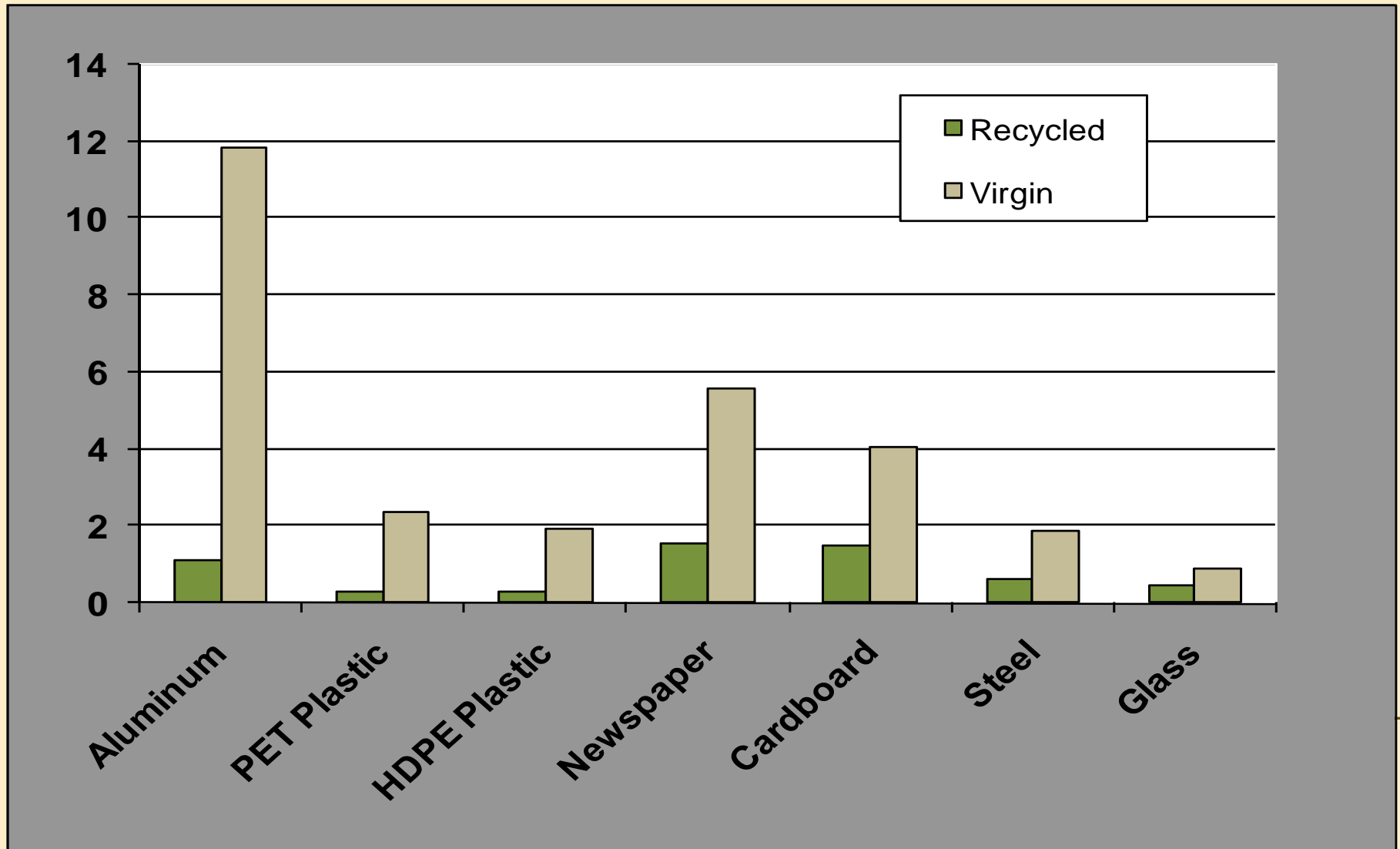
# Energy Use: Recycled & Virgin Content Products (million Btus per ton)



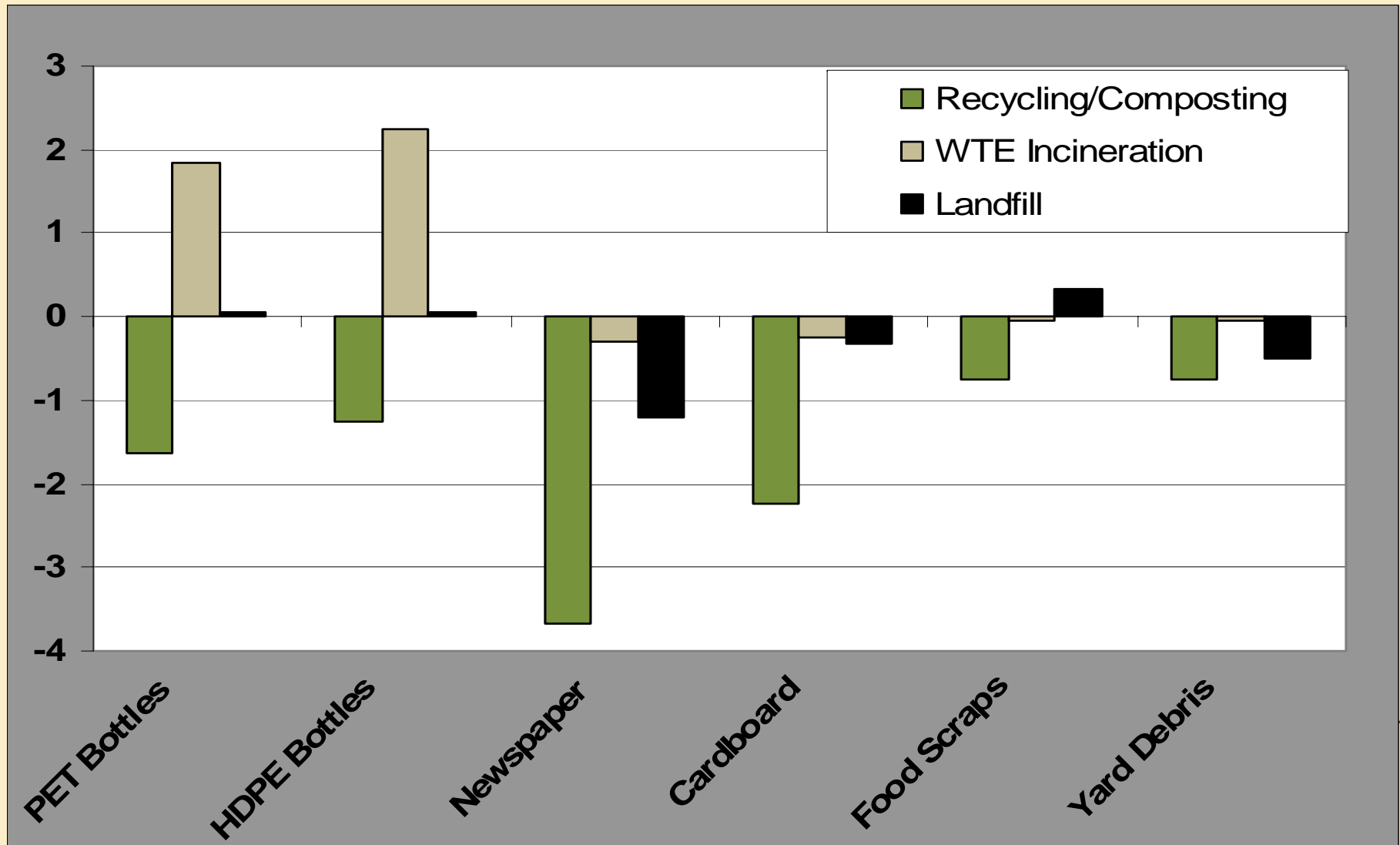
# Energy Conserved by Recycling vs. Generated by WTE Incineration (million Btus per ton)



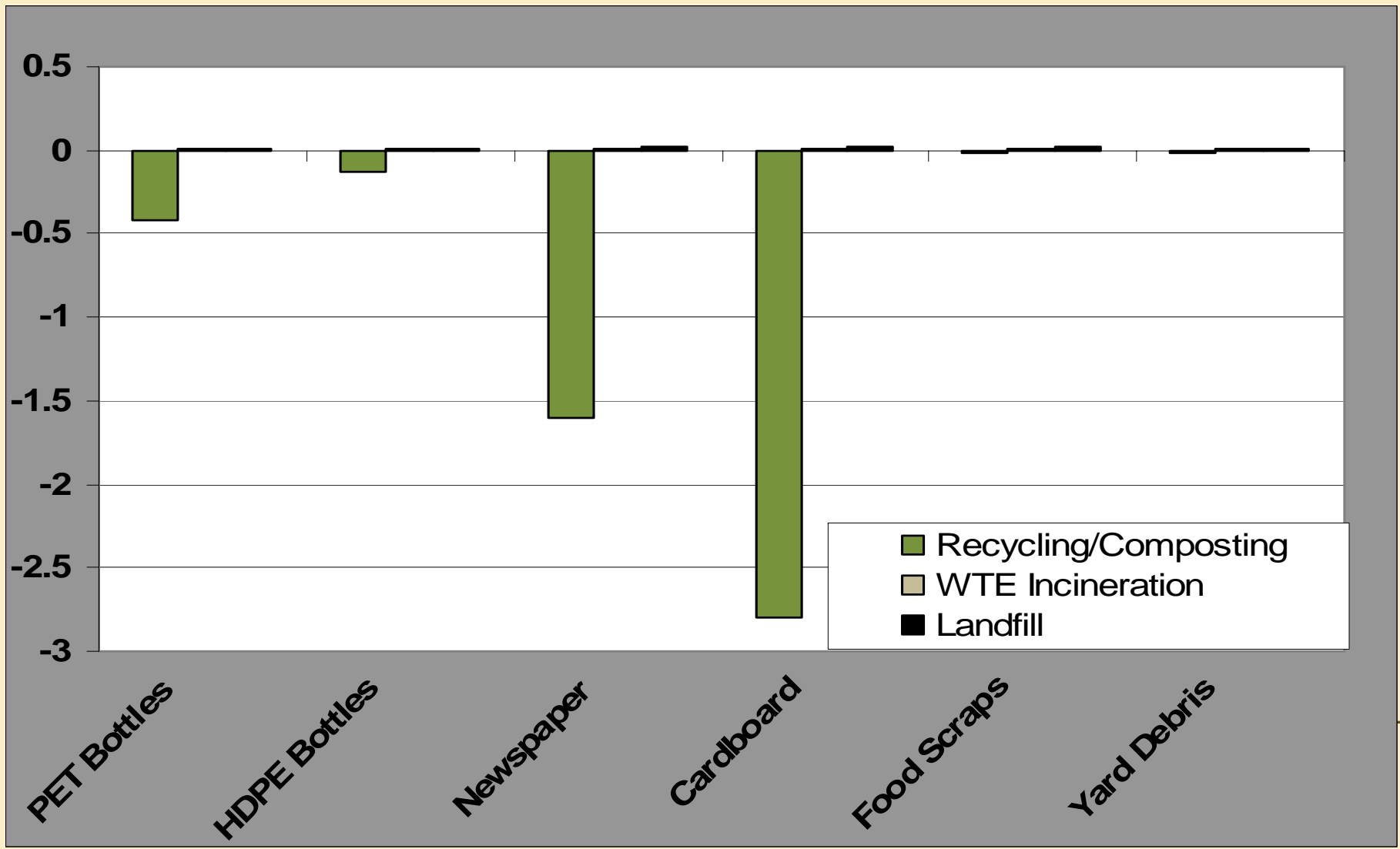
# GHG Emissions: Recycled & Virgin Content Products (tonnes eCO2 per tonne)



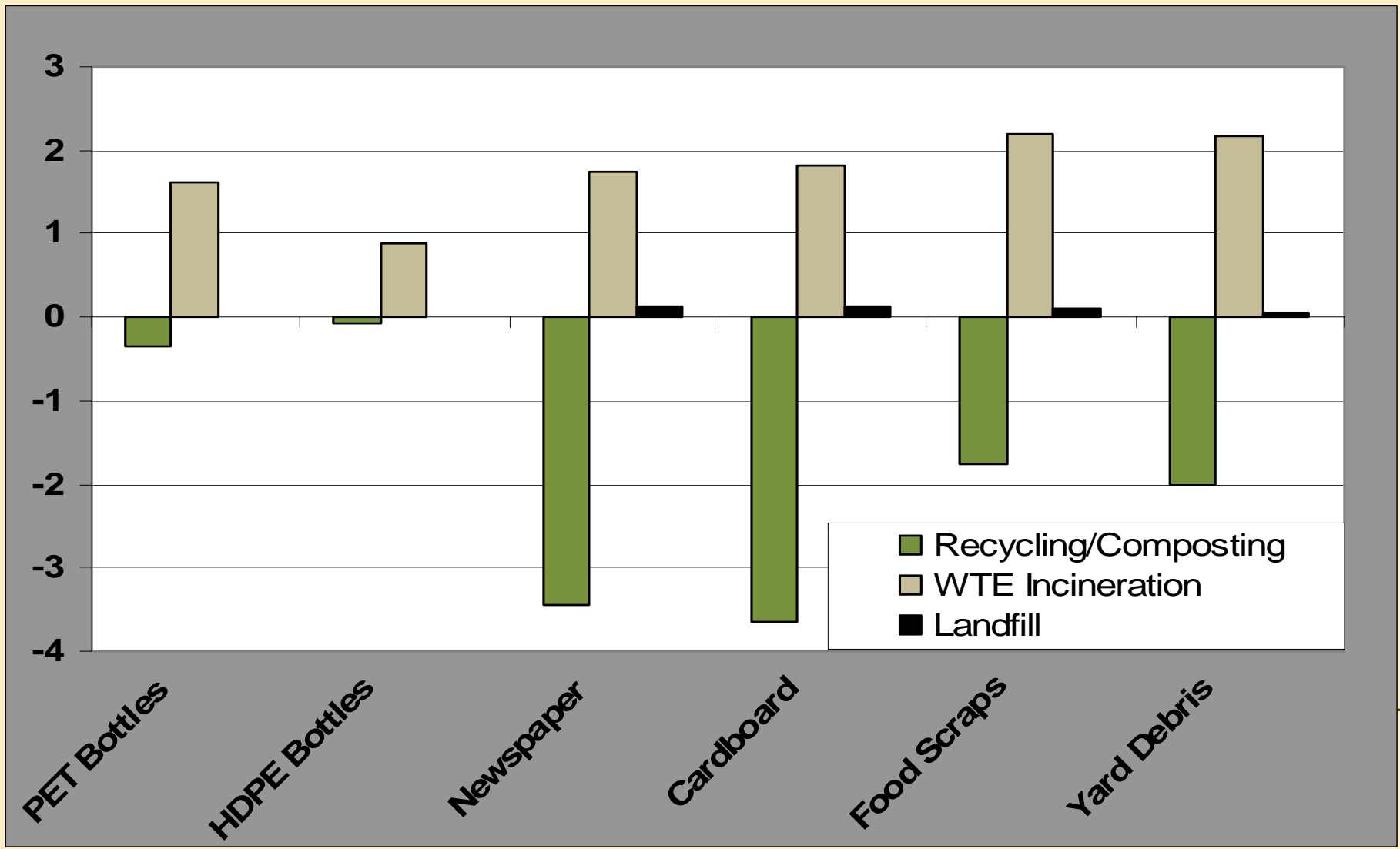
# GHG Emissions Increase/(Decrease) (tonnes eCO<sub>2</sub> per tonne)



# Health Threatening Emissions Increase/(Decrease) (tonnes eToluene per tonne)



# Ecosystems Toxicity Emissions Increase/(Decrease) (kilograms e2,4-D per tonne)



## Average Environmental Impact Increase/(Decrease) (kilograms per tonne)

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	Climate (eCO <sub>2</sub> )	Health (eToluene)	Ecosystems (e2,4-D)
Recycling & Composting	-1,750	-930	-2
Landfill	-270	50	>-0.5
WTE	285	95	1

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## Possible Reasons for Divergent Results from LCAs

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- ❖ Landfill carbon storage included?
  - ❖ Realistic projections for landfill gas control?
  - ❖ Fossil CO<sub>2</sub> emissions from MSW combustion included?
  - ❖ Electricity offset – coal, natural gas or renewables?
  - ❖ Realistic WTE and LFG electricity generation?
  - ❖ Emissions profile – minimal or robust?
  - ❖ Environmental impacts other than climate change included?
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## Portion of Carbon Content of an MSW Material That is Stored in Landfills (US EPA estimates, 2008)

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Newspaper	86%
Cardboard	55
Food Scraps	16
Grass	53
Leaves	85

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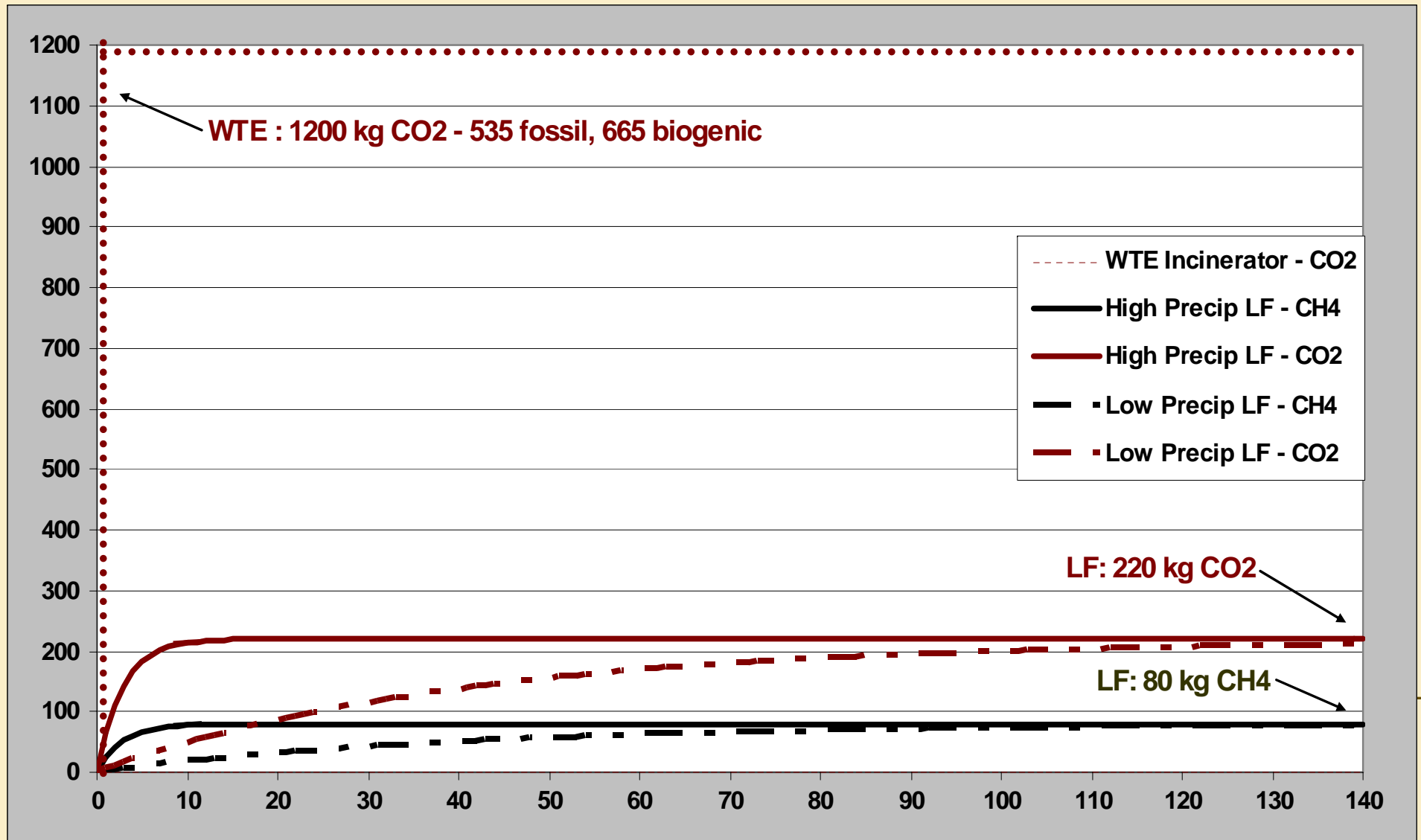
## GHG Emissions for Electricity Generation (tonnes eCO<sub>2</sub> per GWh)

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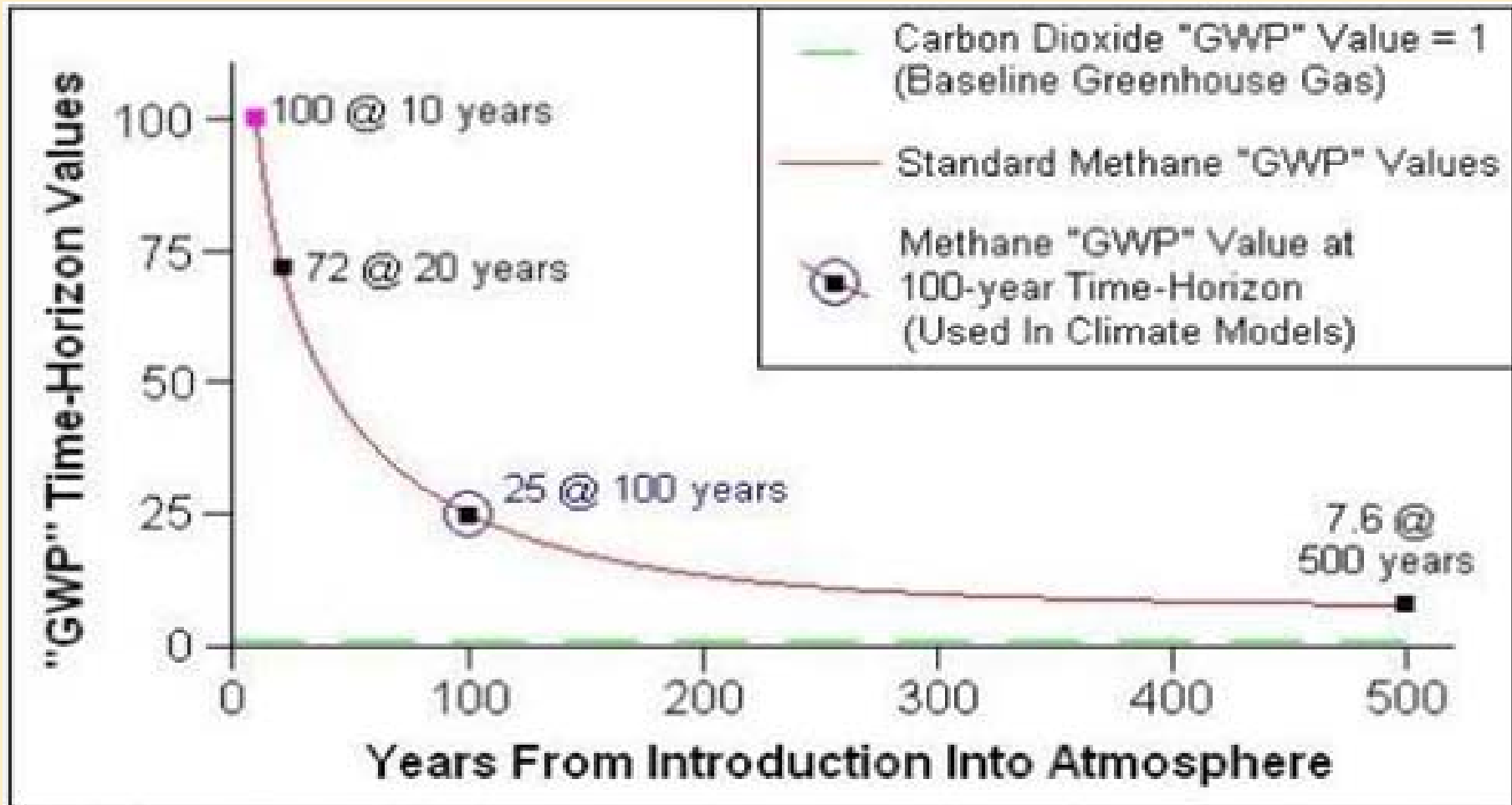
Coal	900
Natural Gas	350
BC Consumption Avg.	87
Wind	0

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# CO2 & CH4 Cumulative Generation Over 140 Years (kilograms per tonne of MSW disposal)



# GWP for Current Releases of Methane over Different Time Horizons



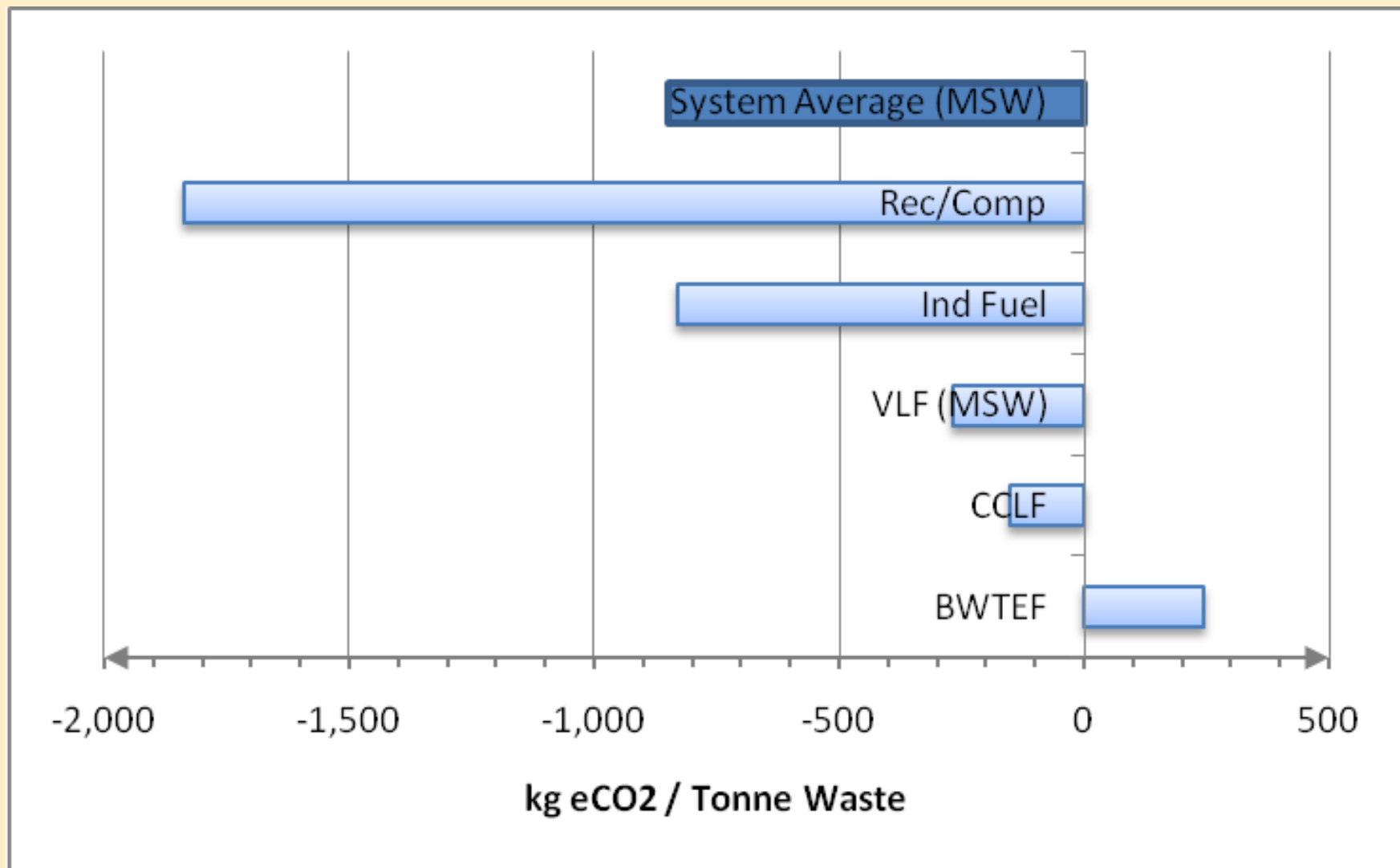
Source: IPCC, Fourth Assessment Report Data (2007)

## Lifetime Generation & Release of CO<sub>2</sub> & CH<sub>4</sub> (kilograms per tonne of MSW disposal)

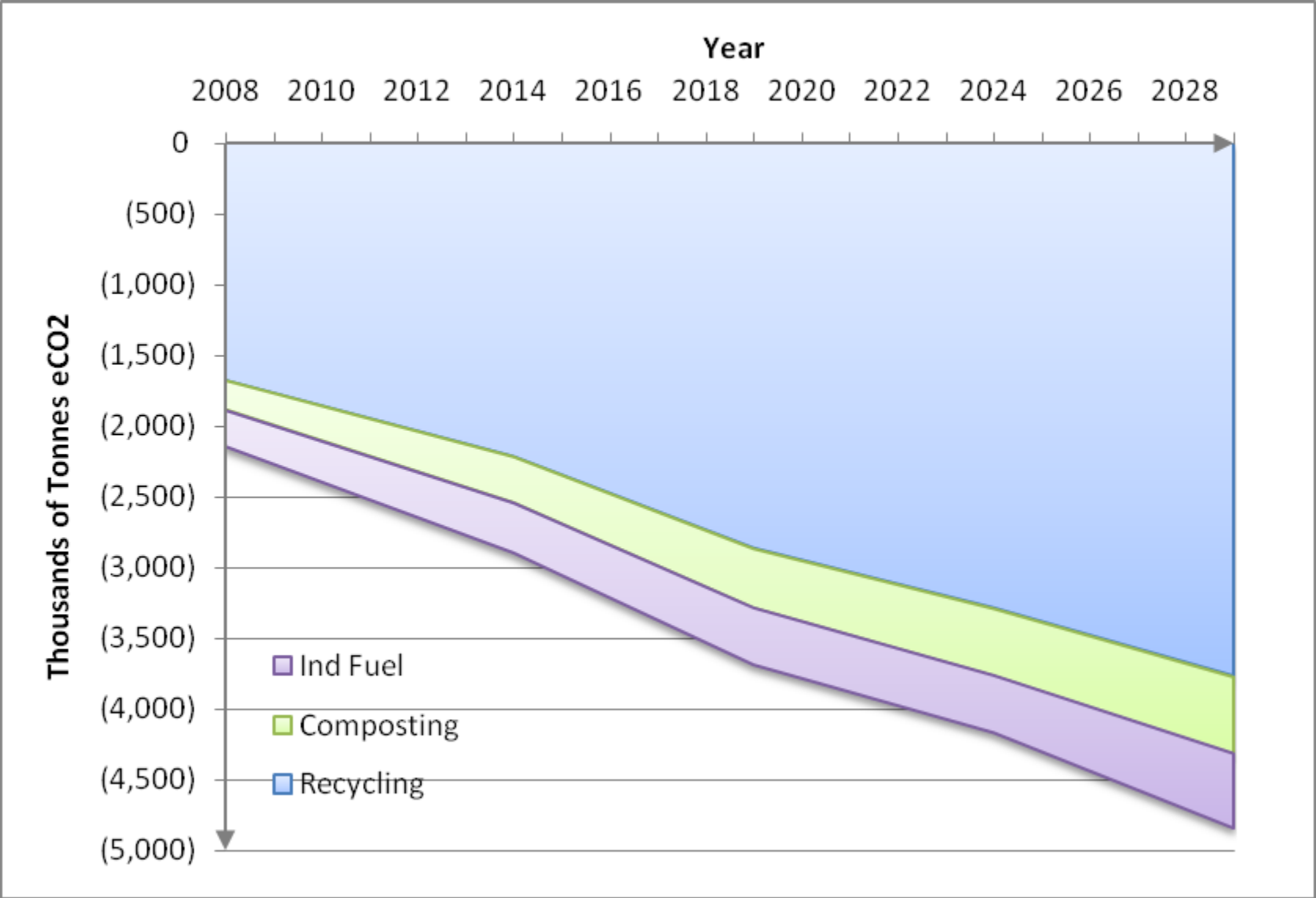
	<u>Generation per Tonne MSW</u>			<u>Releases per Tonne MSW</u>		
	<u>WTE</u>	<u>Landfill</u>		<u>WTE</u>	<u>Landfill</u>	
		<u>High</u>	<u>Low</u>		<u>LFG Capture Rate</u>	
		<u>Precip LF</u>	<u>Precip LF</u>		<u>75%</u>	<u>90%</u>
<b>Fossil CO<sub>2</sub></b>	535			535		
<b>Biogenic CO<sub>2</sub>*</b>	665	220	220	665	395	430
<b>Methane (CH<sub>4</sub>)</b>		80	80		20	8
<b>GHG eCO<sub>2</sub></b>	535	2,000	2,000	535	500	200
<b>Total eCO<sub>2</sub></b>	1,200	2,220	2,220	1,200	895	630

\* Includes CO<sub>2</sub> from combusting methane in captured landfill gas.

# GHG Emissions Increase/(Decrease) – 2008 (kilograms eCO<sub>2</sub> per tonne)



# Net GHG Emissions from Waste Diversion (2008-29) Zero Waste Scenario





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The End  
Thank you.

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