

# Zero Waste Strategy LCA Results:

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## Why the Vancouver Region Should Fund & Promote 3Rs not 2Ds

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VBOT: Waste Management Forum 09

# Presentation Outline & Summary

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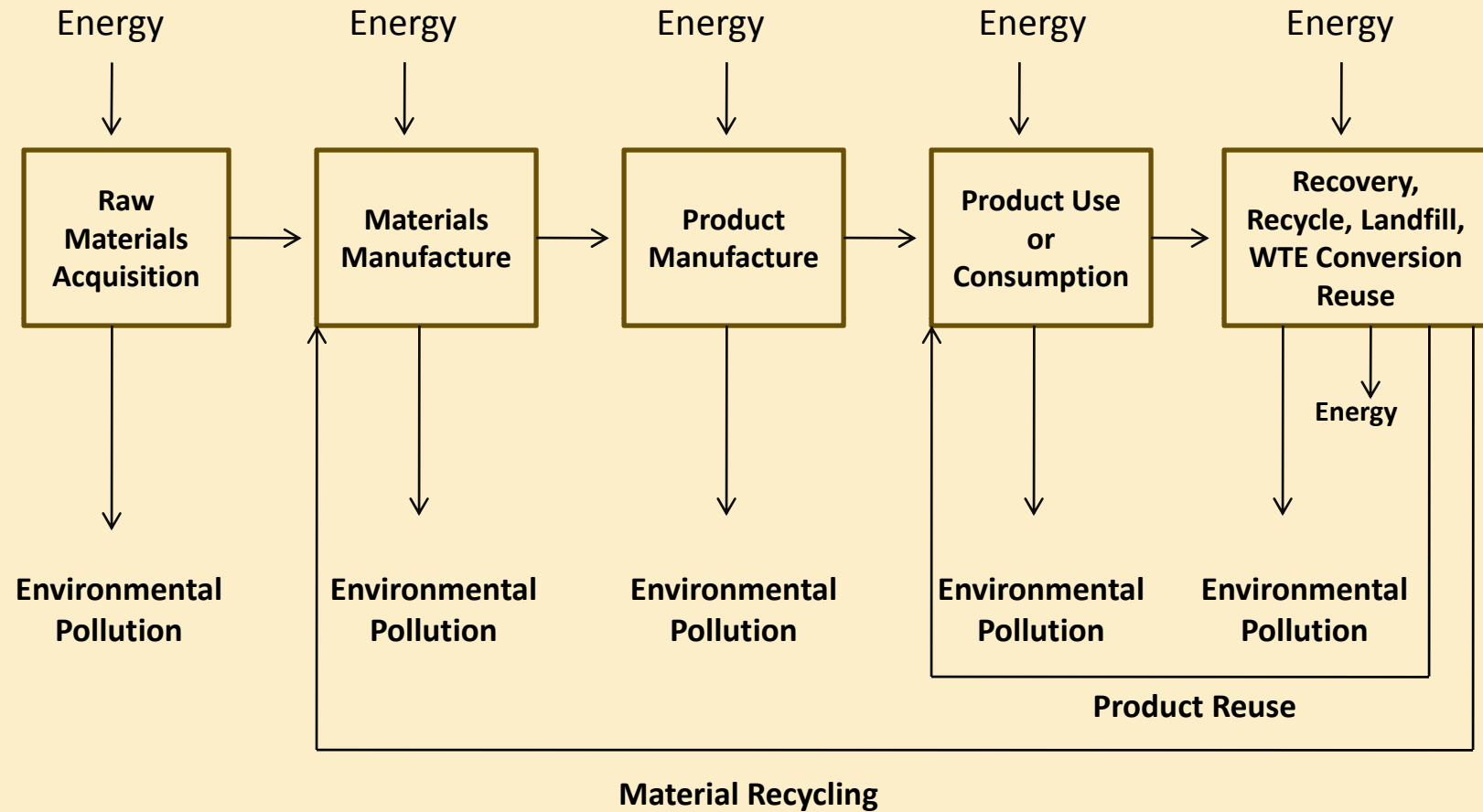
- ✘ MSW: garbage glob vs. discarded resources
- ✘ Recycling widely preferable to disposal in terms of energy & pollution savings
- ✘ Disposal is interim solution not THE solution
- ✘ Landfills better than WTE for climate, human health and ecosystems
- ✘ WTE needs steady fuel supply, which can interfere with waste prevention & recycling opportunities
- ✘ Recycling provides green jobs and local economic development potential

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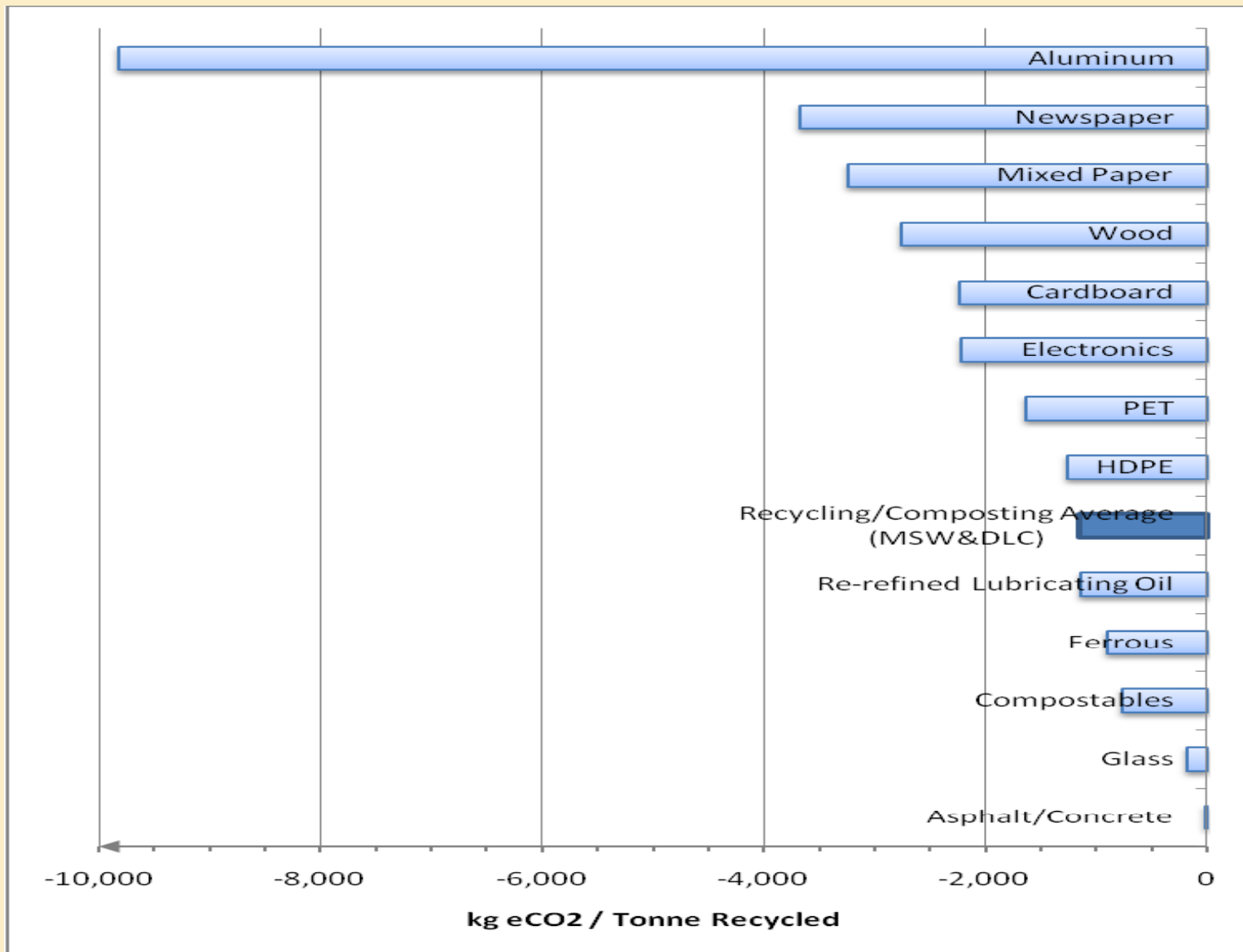
## **Zero Waste Focus:**

**Waste Materials Are Resources  
That Reduce Pollution & Energy Use!**

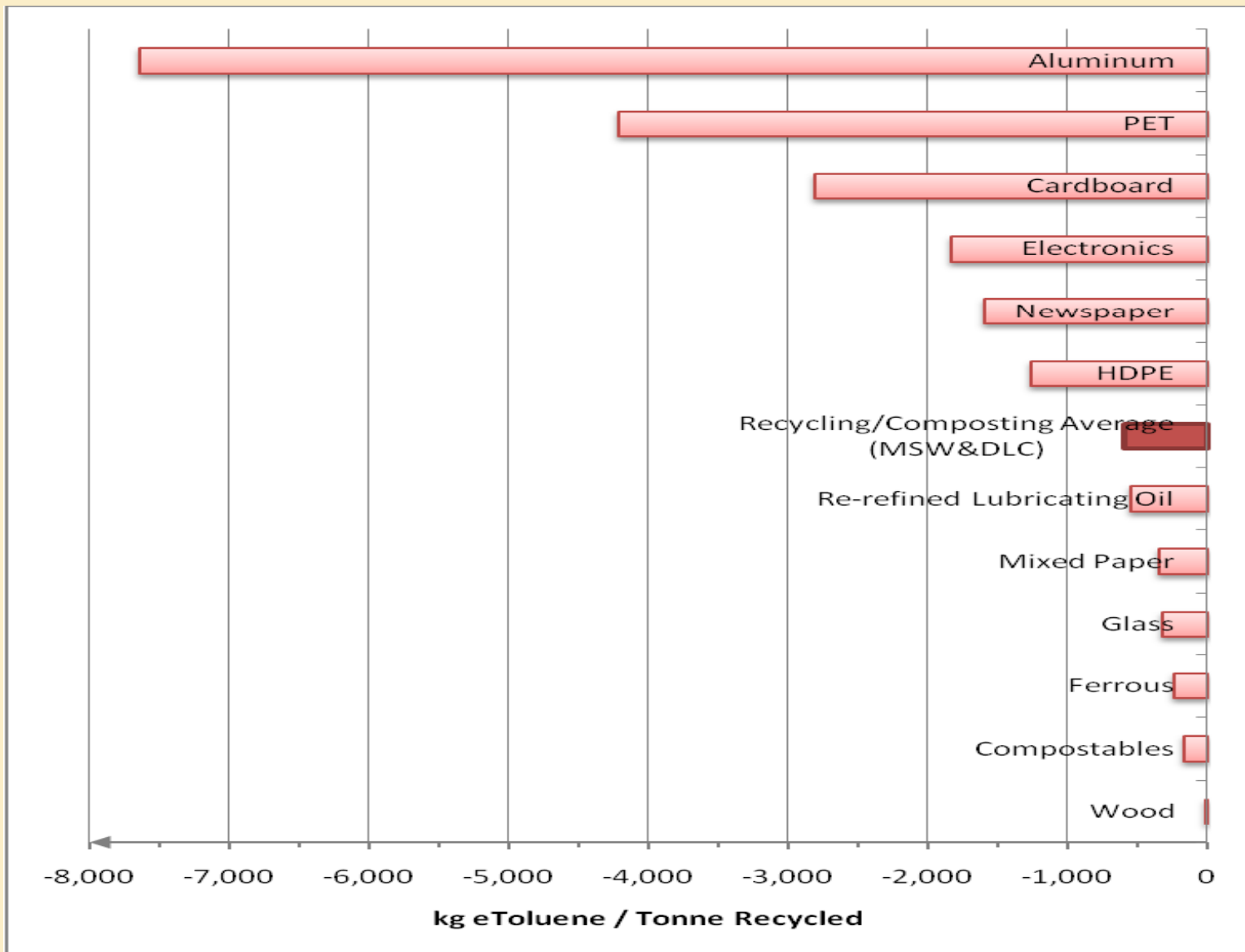
# Life Cycle Analysis (LCA)



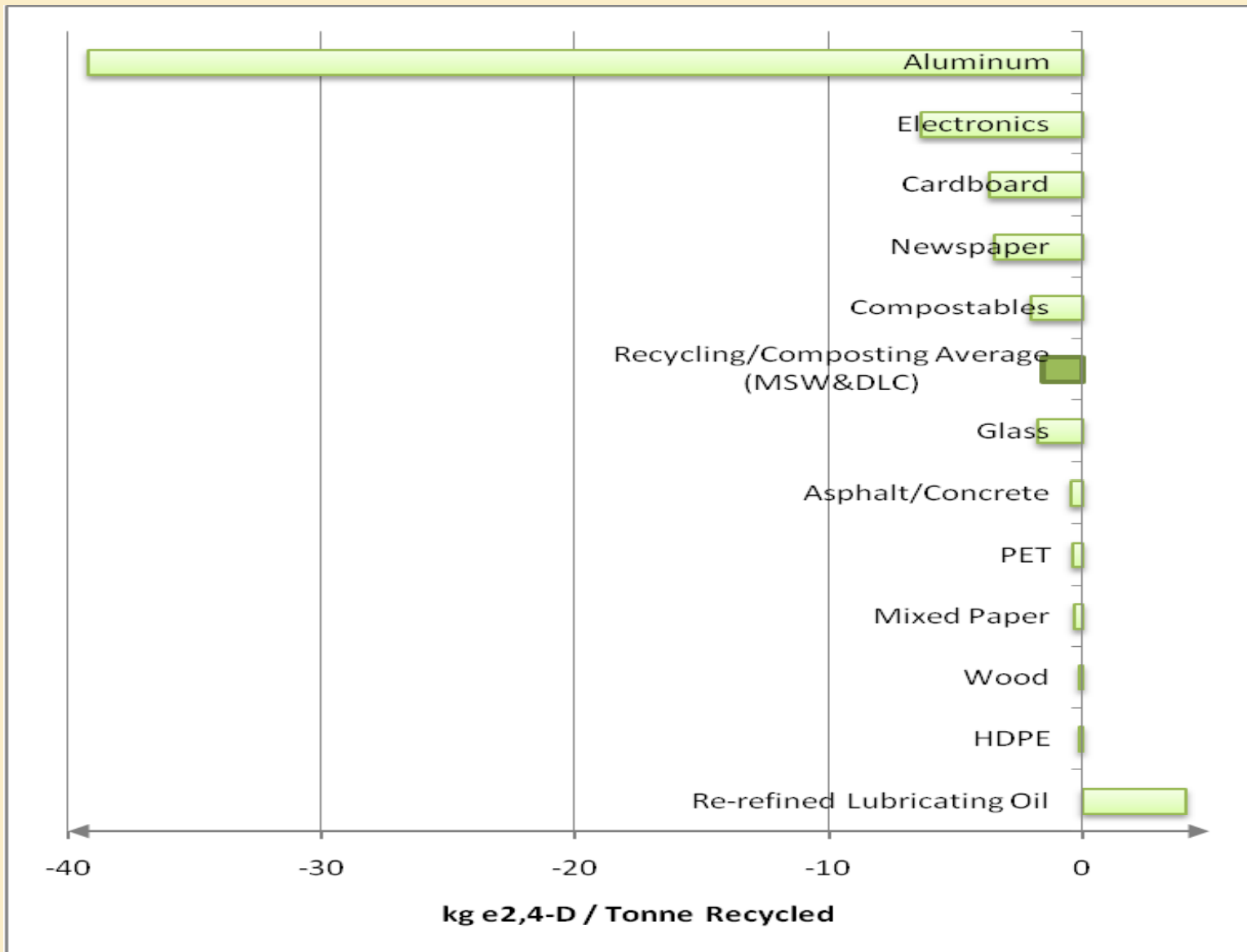
# Greenhouse Gas Emissions per Tonne – Select Recyclable Materials (2008)



# Human Health Emissions per Tonne – Select Recyclable Materials (2008)



# Ecosystem Toxicity Emissions per Tonne – Select Recyclable Materials (2008)



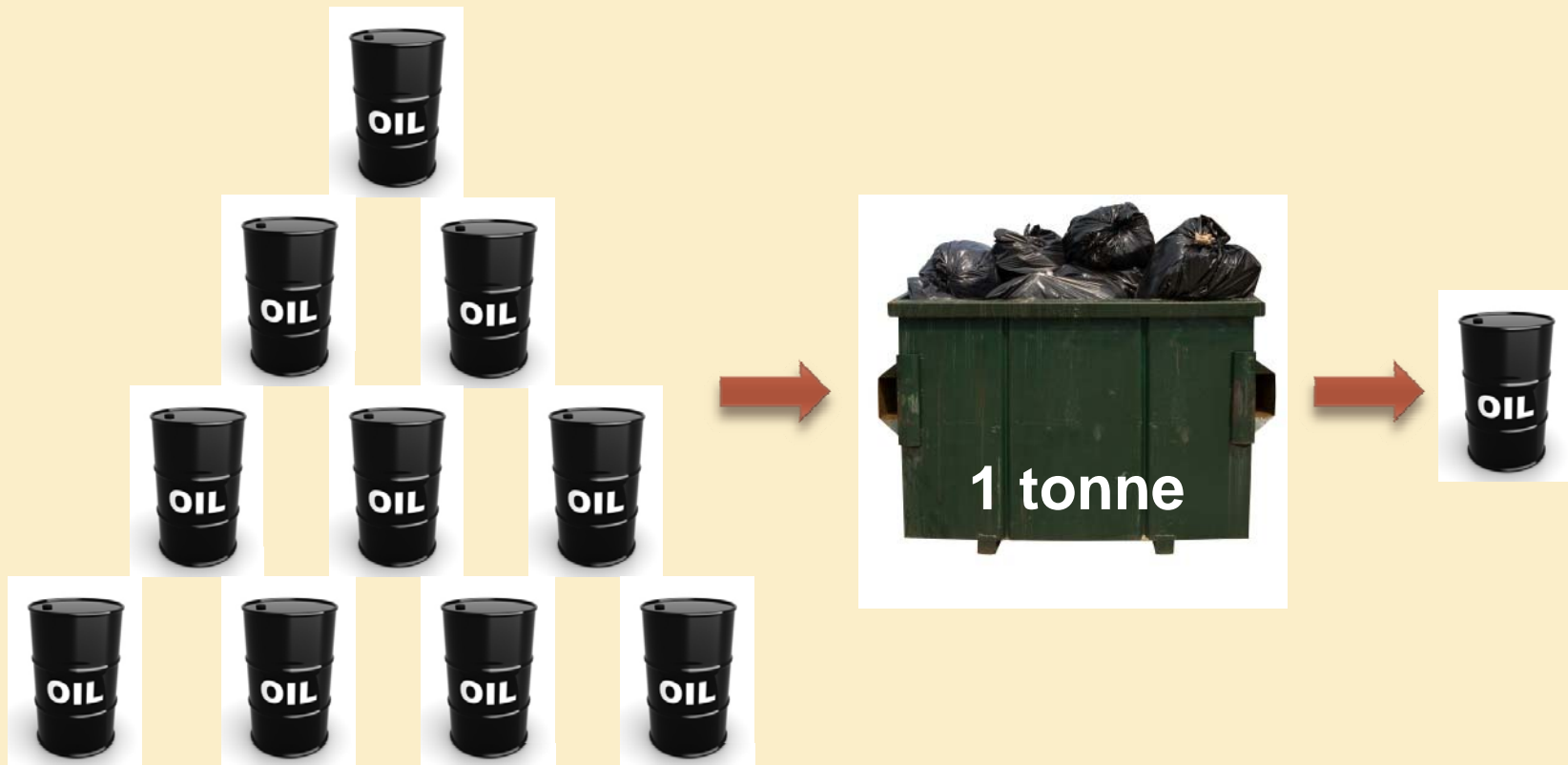
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**Garbage is:**

**Renewable & Sustainable Energy?**



Incineration lobbyists say that  
1 tonne of garbage = 1 barrel of oil



The full picture: it takes **8-10 barrels** of oil to produce 1 tonne of garbage. From this perspective, garbage is neither a sustainable nor a renewable fuel.

Incineration lobbyists say that 1 tonne of garbage = 1 barrel of oil



Recycling **saves** the equivalent of 4 barrels of the oil needed to produce 1 tonne of garbage

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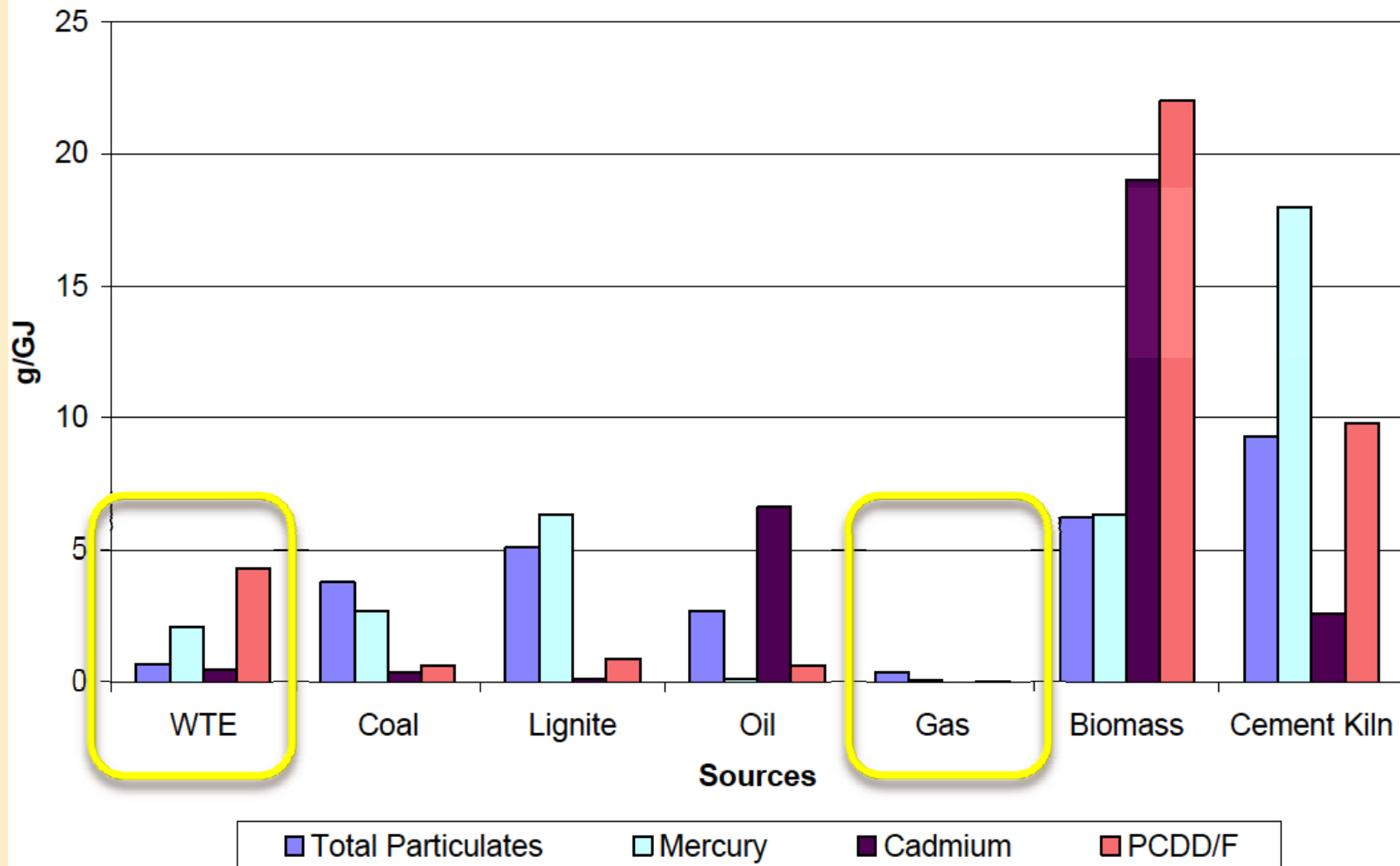
**Garbage is:**

**Clean & Green Energy?**

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

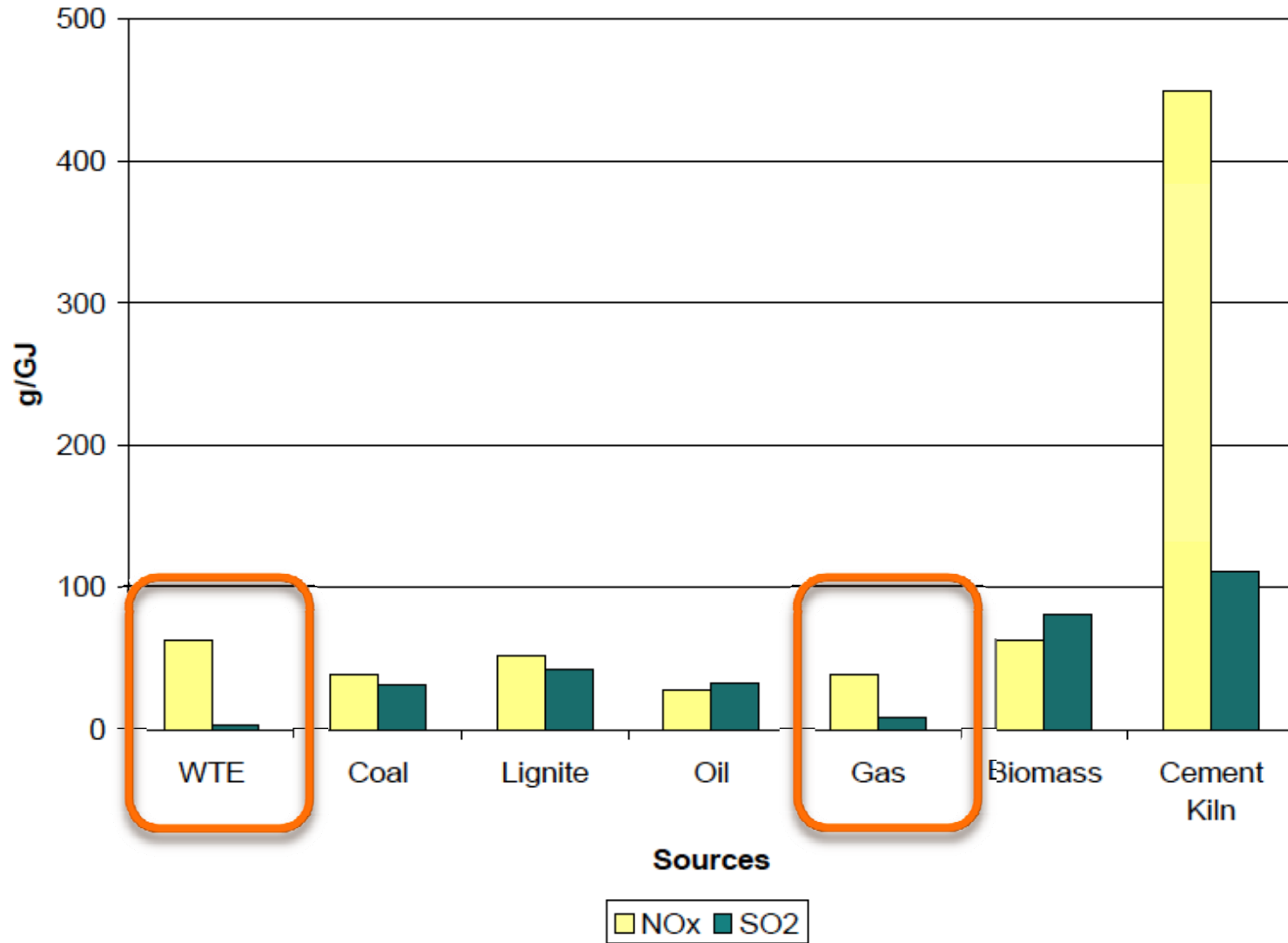
Coal	900 - 1000
MSW Waste-to-Energy	600 - 900
Natural Gas	350 - 400
BC Consumption Avg.	87
Wind	0

Figure 18. Emissions per GJ of Energy Input (1)



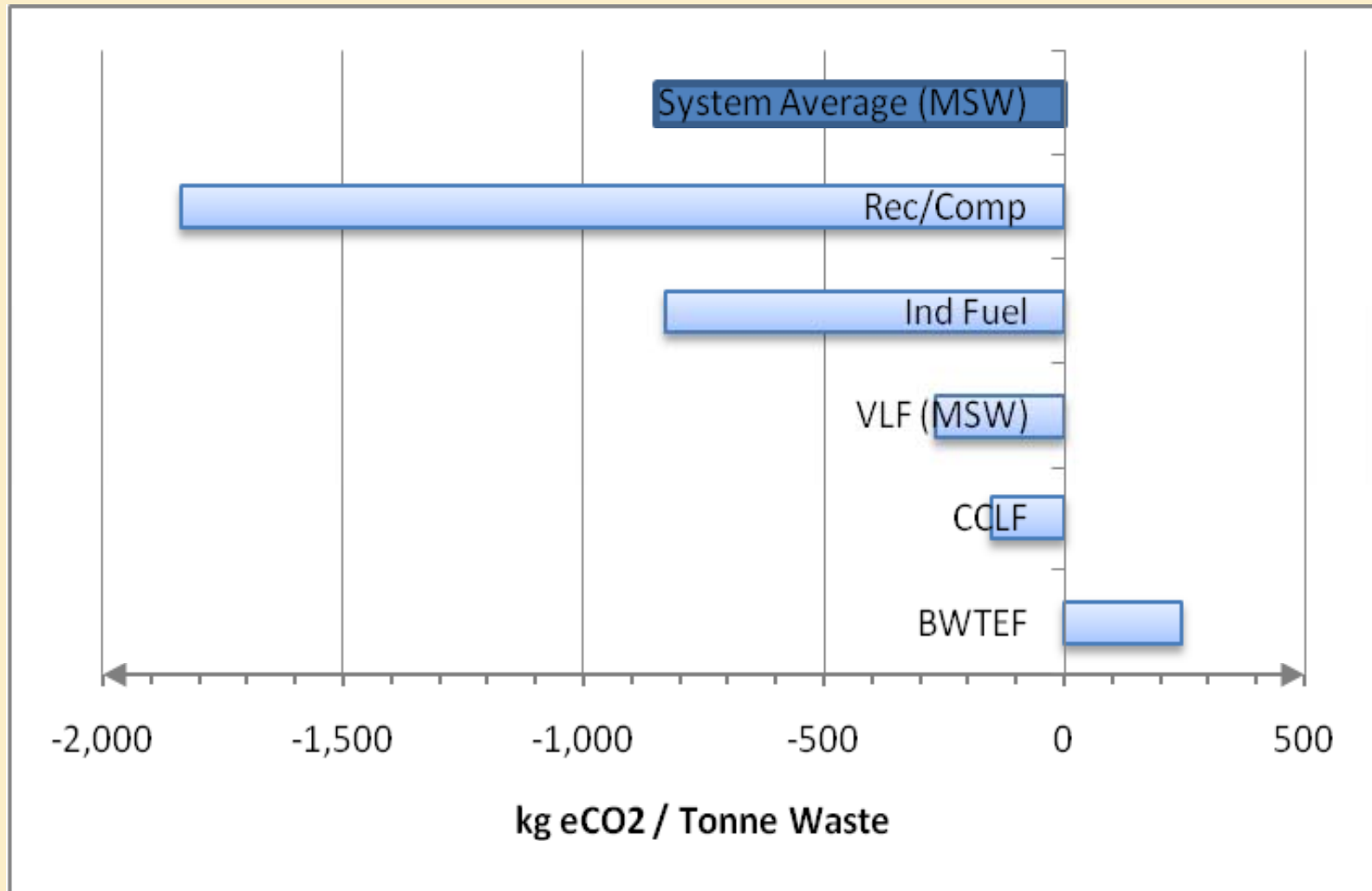
Source: AECOM Canada (2009). *Management of Municipal Solid Waste in Metro Vancouver*.

Figure 19. Emissions per GJ Energy Input (2)



Source: AECOM Canada (2009). *Management of Municipal Solid Waste in Metro Vancouver*.

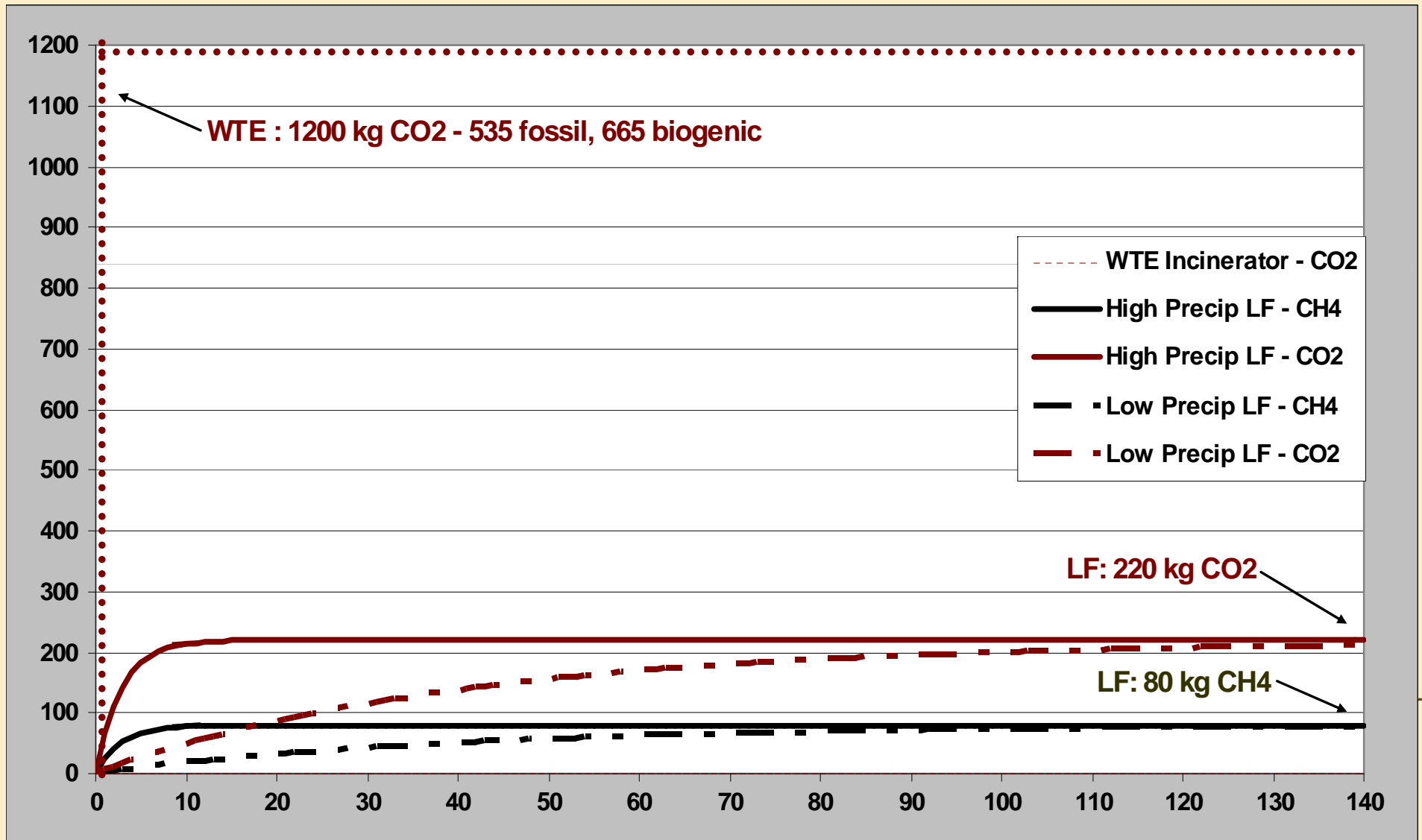
# Greenhouse Gas Emissions per Tonne – MSW (2008)



## Average Environmental Impact per Tonne – MSW (2008)

	Climate (eCO <sub>2</sub> )	Health (eToluene)	Ecosystems (e2,4-D)
Recycling & Composting	-1,835	-945	-2
Landfill	-215	60	<0.1
WTE	245	105	2

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



## Carbon Content Stored in Landfill – Select Recyclable Materials (US EPA, 2008)

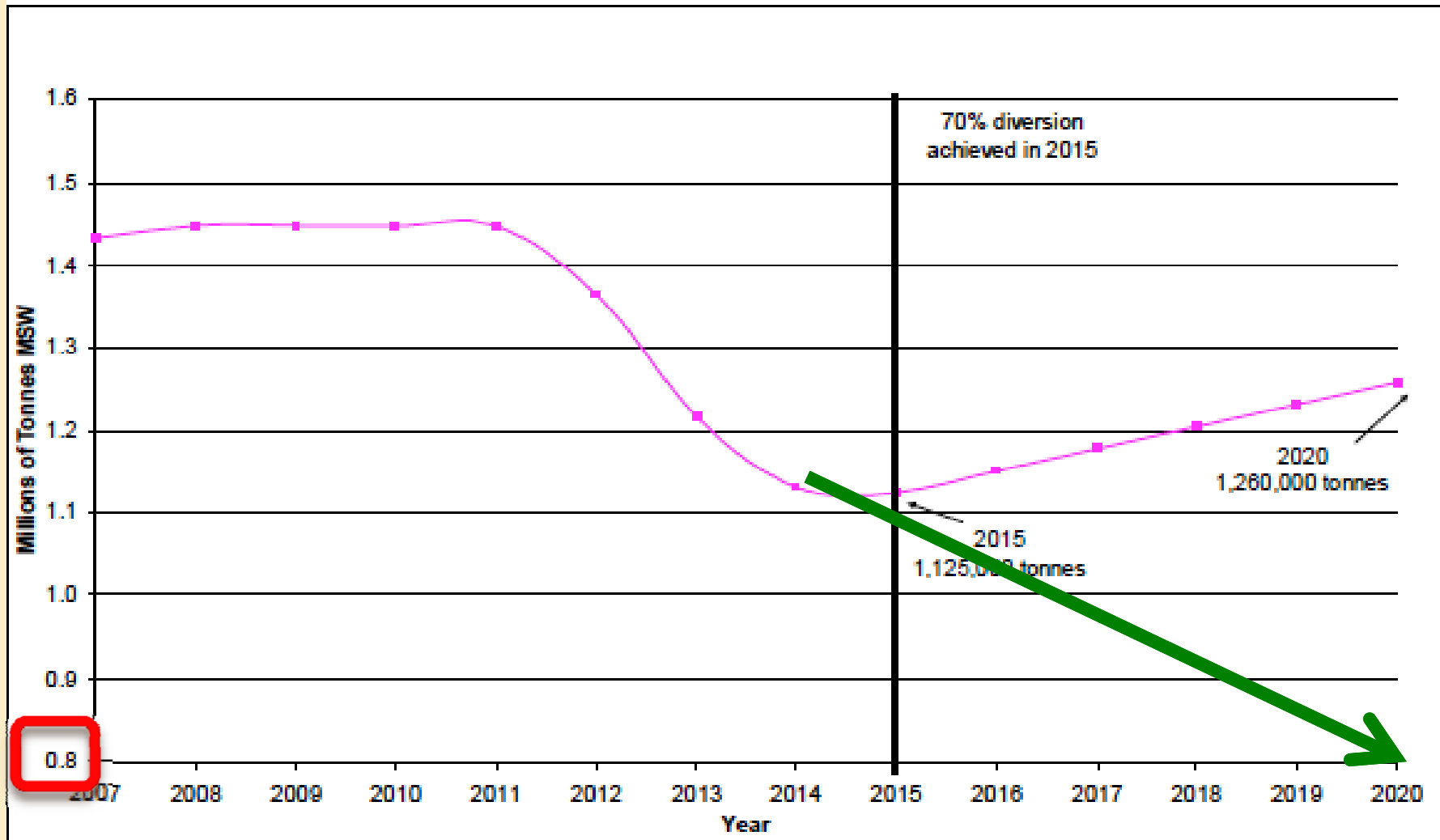
Newspaper	86%
Cardboard	55
Food Scraps	16
Grass	53
Leaves	85

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# **Zero Waste Strategy:**

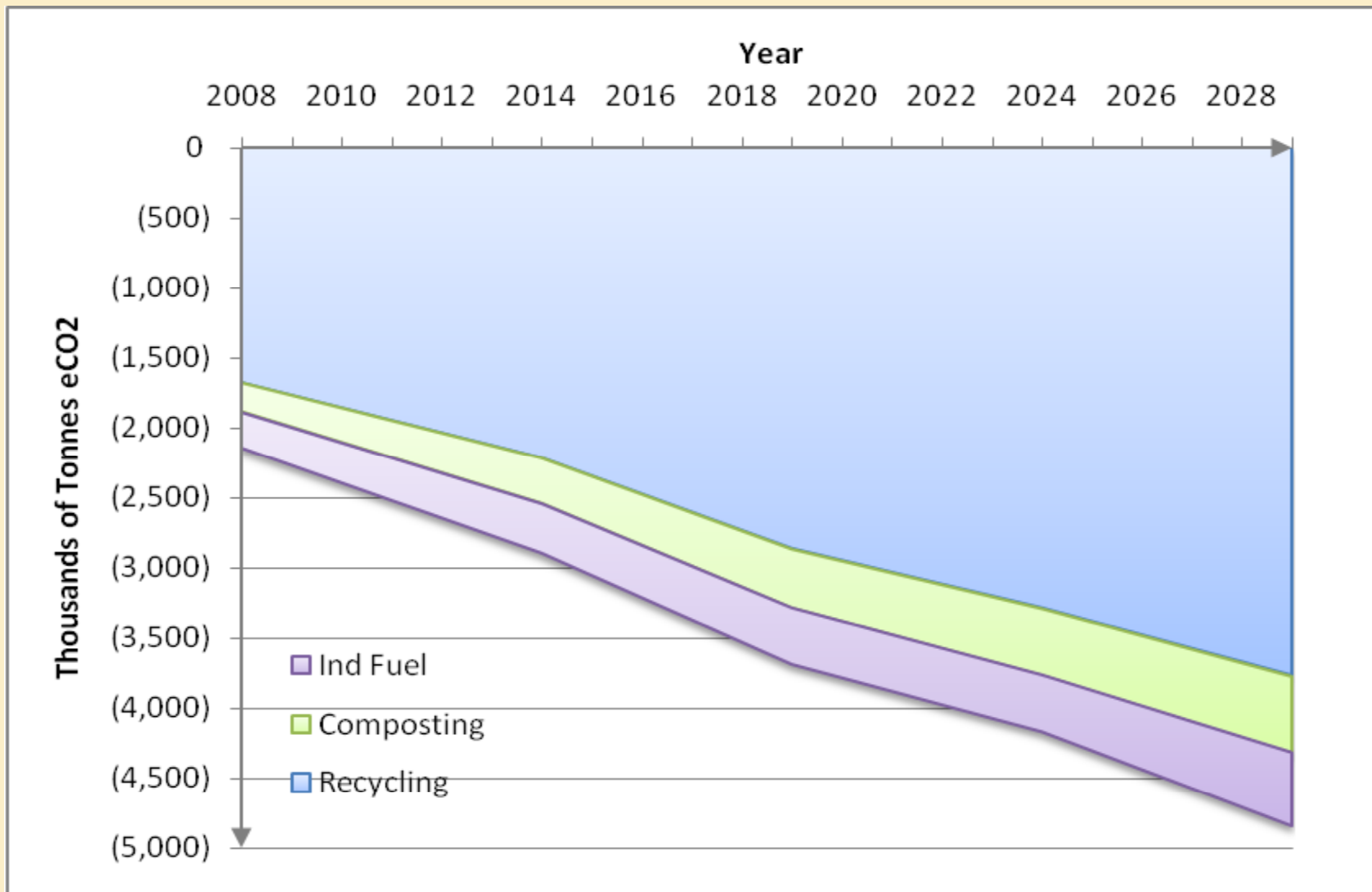
## **Benefits & Methods**

# Waste Requiring Further Treatment and Disposal

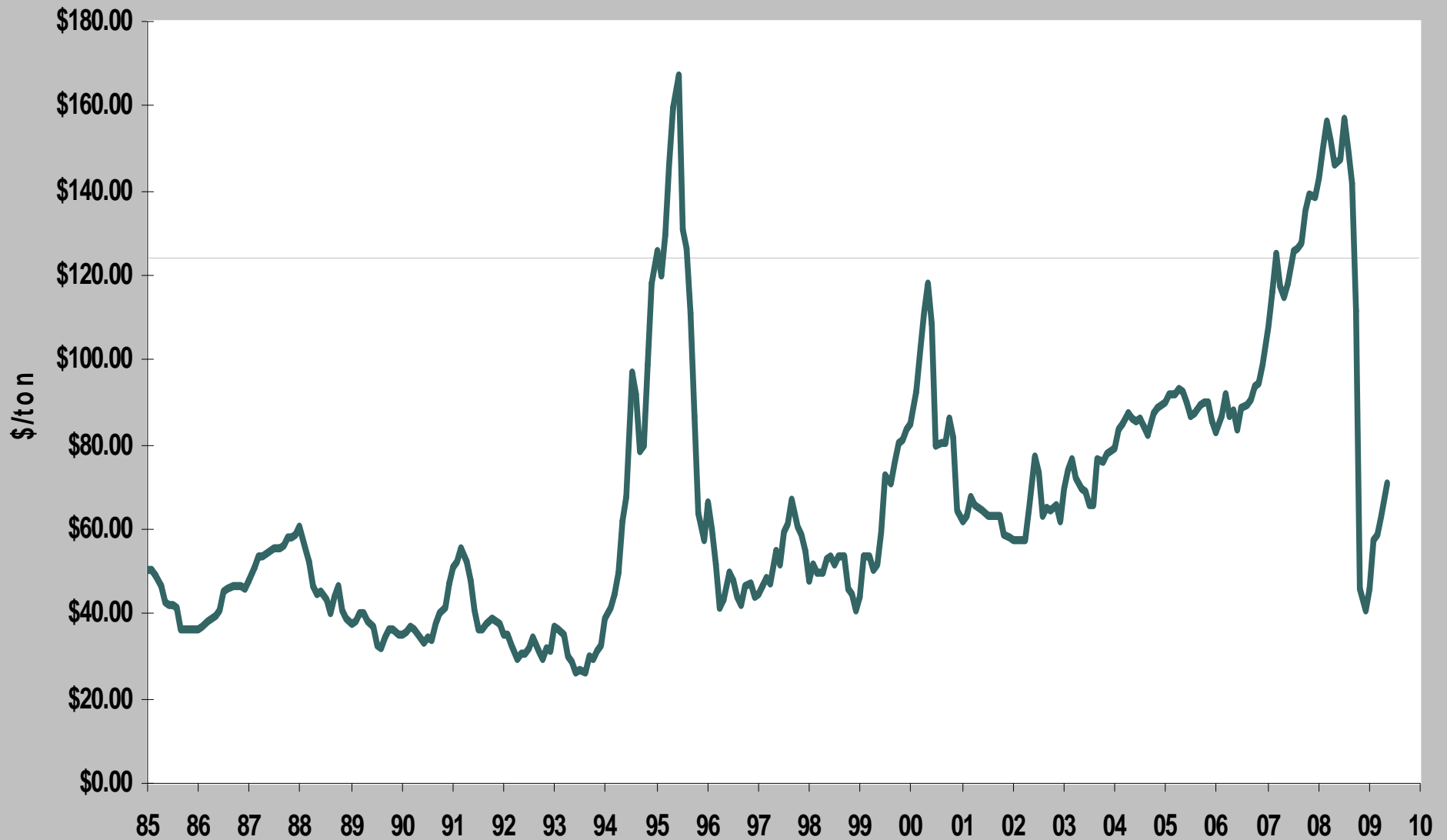


Source: AECOM Canada (2009). *Management of Municipal Solid Waste in Metro Vancouver*.

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



# Average Value for Curbside Recycled Materials Pacific Northwest, 1985-2009



# Zero Waste Strategy Methods

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- ✘ Economic Incentives – linear garbage rates, deposits and refunds, EPR, sin taxes
- ✘ Collection Opportunities - curbside, on site, streetside, and public event containers for recyclables & compostables
- ✘ Bans & Regulations – disposal bans, recycling bylaws, building code specs for collection containers
- ✘ Education & Social Marketing

# Conclusions

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- ✘ Zero waste strategy optimizes environmental and local economic development potentials of recycling
- ✘ Disposal should be viewed as bridging option on the road to zero waste
- ✘ Landfills definitely better than WTE for climate, and at least as good for human health and ecosystems
- ✘ WTE is neither clean, green, renewable, nor sustainable
- ✘ WTE needs steady fuel supply, which can interfere with waste reduction & recycling opportunities
- ✘ Recycling provides green jobs and local economic development potential

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# Thank you.

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