Tracking and measuring solid waste

Benchmarking and Goal Setting for Energy, Water and Solid Waste Management

2007 Environmental Program Series

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Why measure and track solid waste?

- Corporate goals or requirements
- Track program efficiency
- Cost accounting
- Fulfill other tracking or reporting requirements (*e.g.*, Climate Wise membership)

Measuring trash

- Trash is typically measured by volume, *e.g.*, cubic yard
- Capacity * volume * frequency → [1]conversion factor = cy / week / year or tons / week / year
- Example: 1, 3 yd^3 Dumpster is 85% full when it is emptied twice per week =

  (3 * 0.85) * 2 = 5.1 yd^3 / week = 1.1 tons / week

  (5.1 yd^3 * 0.225 [EPA conversion factor])

[1]http://www.epa.gov/epaoswer/non-hw/recycle/recmeas/download.htm

Measuring recycling and diversion

- Recyclables usually measured in pounds / tons by material type, for example:
  - 500 tons of loose (flattened but not baled) cardboard
  - 125 pounds of commingled containers
- Business may choose to **weigh** material (*e.g.*, parcel scale) before it is hauled or
- Estimate based on **volume** and use conversion factor[1] to calculate tons
  - 3, 3-yard Dumpsters of loose cardboard / week =

    3 * 3 * 0.05 = 0.45 tons of loose cardboard / week
- Some vendors will provide monthly itemized report of recycling / diversion activity

[1]http://www.epa.gov/epaoswer/non-hw/recycle/recmeas/download.htm

Measuring costs

- Trash costs usually based on “per pull” cost and size of container
- Recycling charges highly variable based on pick-up charge + rebate (for some materials)

Benchmarking and tracking solid waste reduction

- Diversion rate
- Per capita (generation and reduction)
- Cost (including source reduction and other avoided costs)

Diversion rate

- Diversion rate:
  - % diverted from total solid waste
  - *Example:* 50 tons recycling + 75 tons trash = 125 tons total solid waste = 40% diversion rate
- Zero Waste = 100% diversion (or all waste is diverted from landfill disposal)

Diversion benchmarks

- Diversion rates typically not regulated or mandated (exceptions include California laws requiring community diversion rates of >50%)
- Diversion related benchmarks vary according to business type (estimated):
  - Breweries: >95% diversion
  - Office buildings: 50-75%+ diversion
  - Restaurants: >50% diversion
  - Retail: 50-75% diversion
  - Manufacturing: 50-75%+
  - Residential: >50% diversion

Per capita

- Divide recycling or landfill tons by number of employees
- Or normalize to business size (*e.g.*, per 100 ft^2)
- Per capita solid waste benchmarks (by building type)[2]:
  - Office buildings: 1.5 lbs /100 ft^2 / day
  - Retail: 3 lbs / 100 ft^2 / day
  - Restaurants: 2 lbs / 100ft^2 / day

[2]USGBC LEED Reference Guide for New Construction & Major Renovations

Tracking costs

- Track total costs: (cost to landfill + cost of recycling program) + **avoided costs**
- Avoided costs include avoided landfill tipping fees plus source reduction (using less)
- Example: 50 tons of cardboard = $8,000 to landfill (+ worth $1,400 in rebates); net avoided costs = $9,400

Other benchmarks

- City of Fort Collins City Council Policy Goal: 50% community diversion by 2010
  - Fort Collins diversion rate (2006): ~26%
- LEED – New Construction
  - MR Credit 2.1-2.2: 50-75%+ construction waste diversion for 1 or 2 points
  - MR Pre-req 1: Storage and Collection of Recyclables

Which method?

- Consider several metrics to track programs over time:
  - Diversion rate +
  - Per capita +
  - Costs
- Things to consider:
  - Pay attention to classes of heavy materials that skew diversion rates
    - Multi-part diversion rate can help isolate trends
  - Recycling refers to all types of diversion activity, including reuse, donation, composting, etc.

Resources

- fcgov.com/recycling
- fcgov.com/climatewise
- *Measuring Recycling: A Guide for State & Local Governments*:
  www.epa.gov/epaoswer/non-hw/recycle/recmeas/download.htm
- *USGBC LEED Reference Guide for New Construction & Major Renovations*
  www.usgbc.org/leed

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