Financial Incentives to Increase Recycling

The Volume-Based Waste Fee System in Urban Areas

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State of Waste in New York City

MSW hauling costs New York City $1 billion annually

- Collection: $228/ton
- Tip Fees: $90+ dollars/ton (& rising)
- Long-Distance Hauling: $305 million/ year

PlaNYC sets out ambitious goals

- Double recycling by 2017 from 15→30%
- Reduce MSW volume 75% by 2030

New York City Is not on track

Philosophy of VBWF Programs

The **Volume Based Waste Fee** (VBWF) model charges a variable rate for waste collection and disposal depending on volumes produced. Recycling is provided for free.

Benefits of VBWF (volume-based waste fee) system:

- Reduces waste and improves recycling via simple market incentives
- Enhances awareness of costs associated with MSW production
- More equitably distributes costs of disposal among highest users

Adoption of VBWF Programs

Growing in popularity

Available to about 25% of the US population– including programs in 30 of the largest 100 cities in the US

70% growth between 1997-2006

Simple and Effective

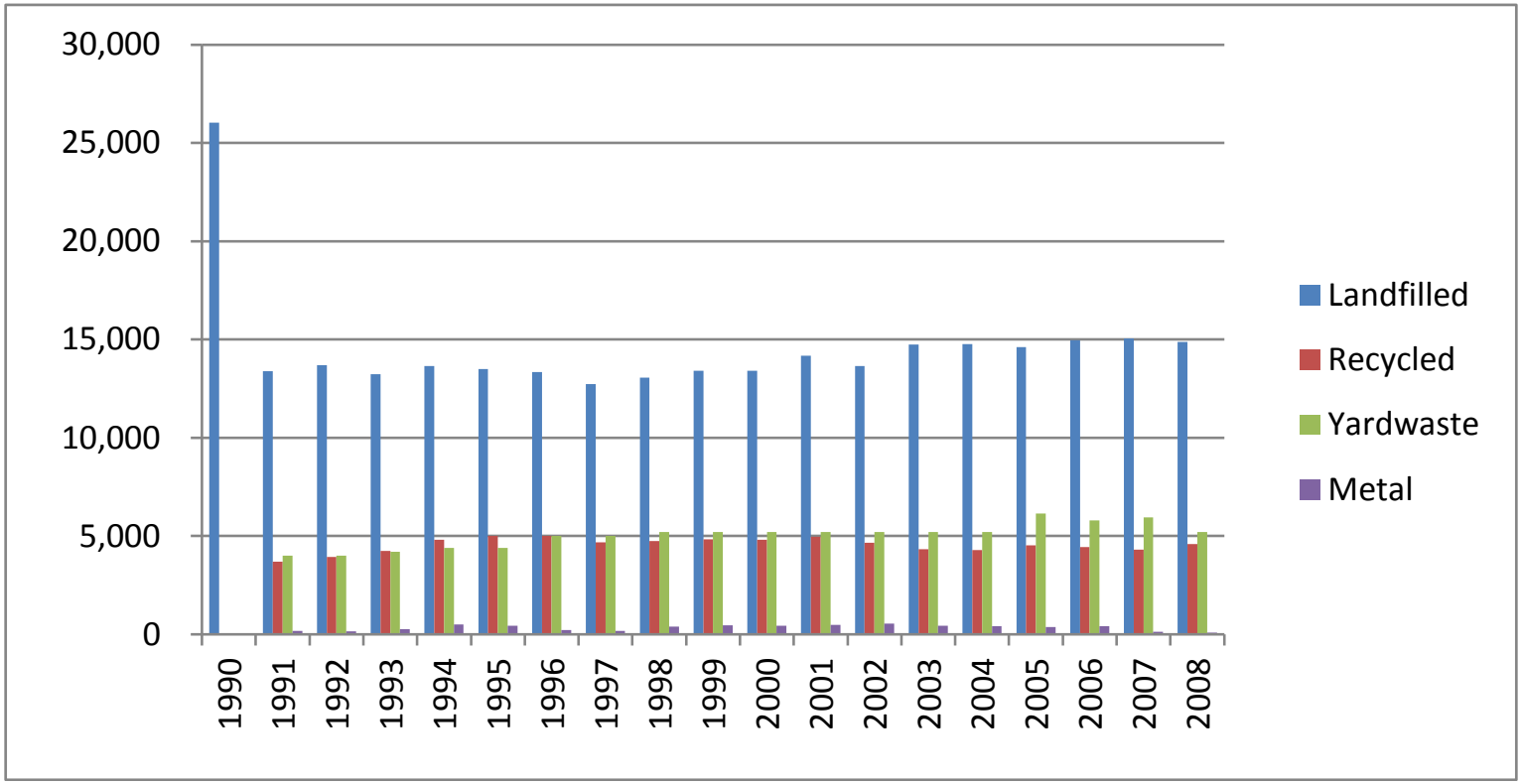
PAYT programs reduce residential MSW by approximately 17% mass

- Increase in recycling programs,
- Diversion to yard waste composting programs
- Reduction in nonrecyclable waste

Suburban Case Study: Binghamton, NY

Since bag-based PAYT/VBWF was applied in 1991:

- *Cut landfilling 50% the year introduced*
- *Recycling rate steady at 41%*
- *Elimination of line item tax for waste disposal*



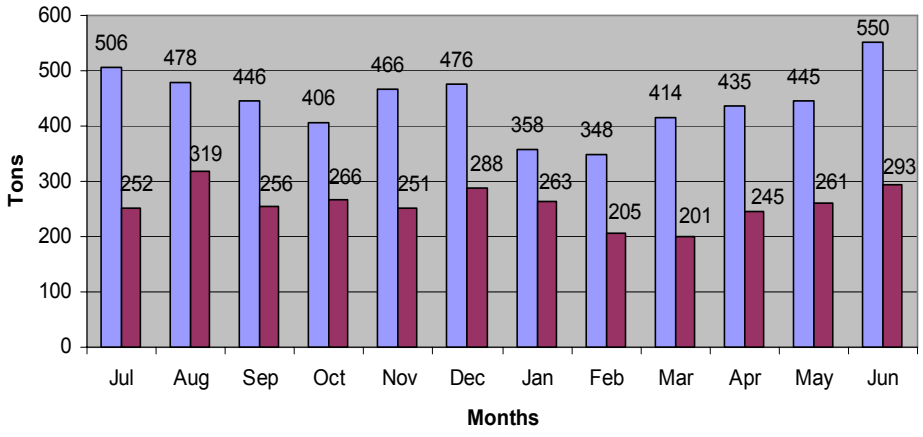
City Of Binghamton Summary Solid Waste Report, 2012

Low-Density Case Study: Sandwich, MA

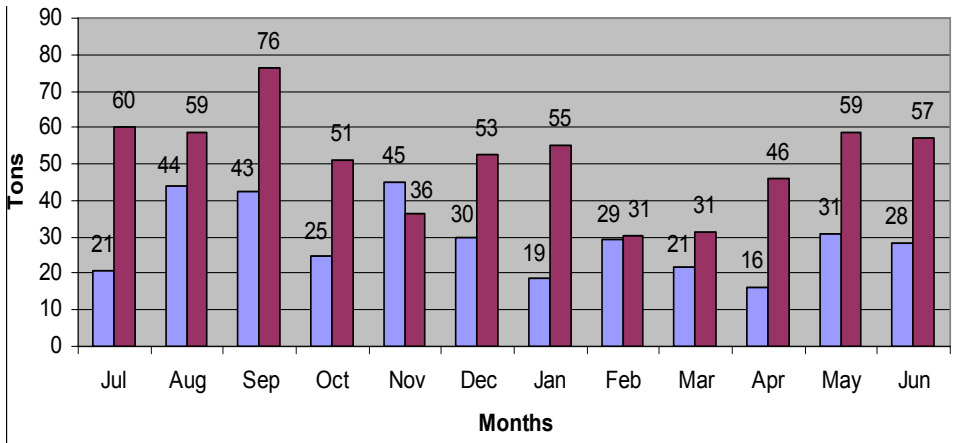
Since sticker-based PAYT/VBWF was applied in 2011:

- *Solid waste reduced by 42%*
- *Recycling rate improved from 29% to 54%*

MSW Volumes 2011-2012



Recycling Volumes 2011-2012



Sandwich Department of Public Works: Pay As You Throw 12 Month Update

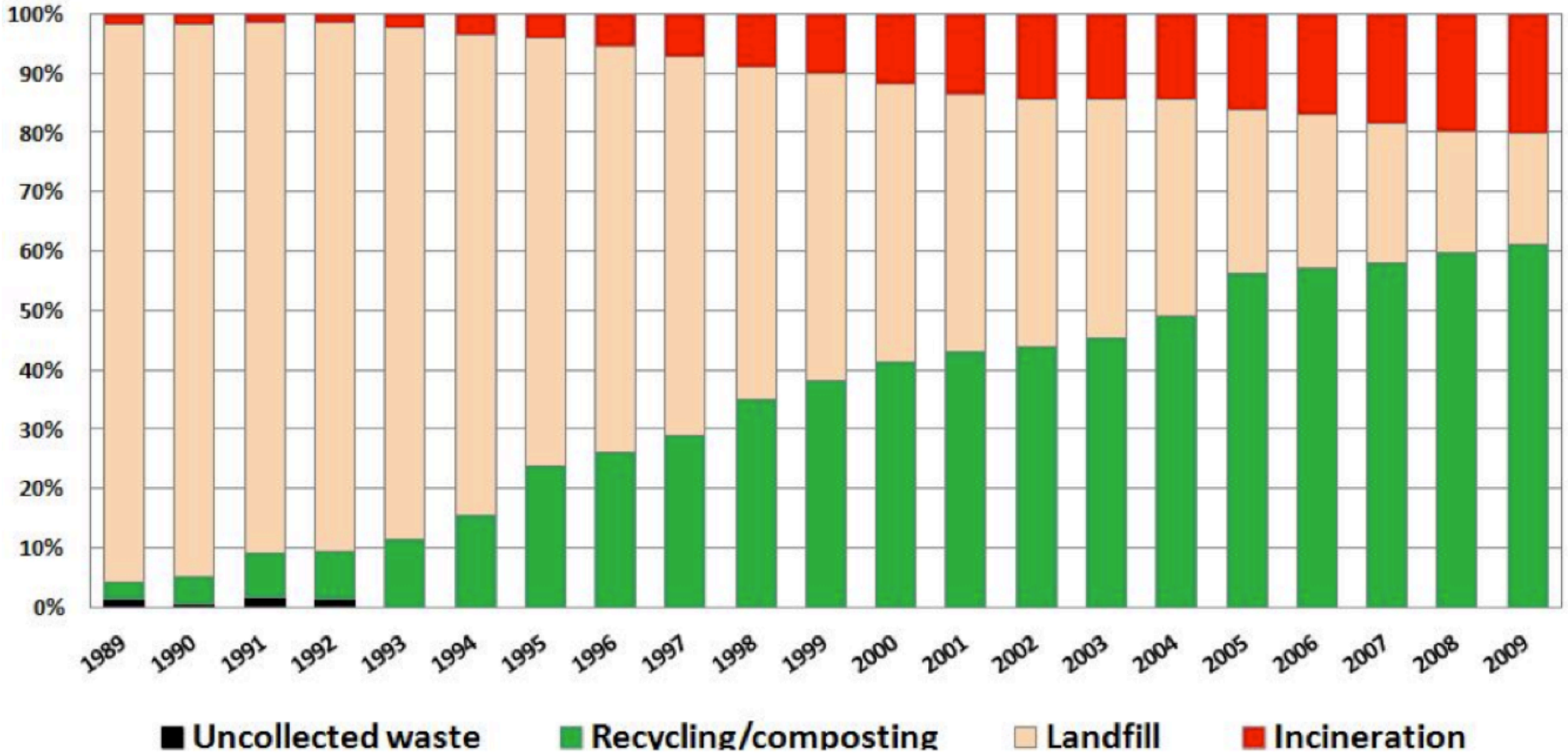
Suburbs Versus City

Suburbs Versus City

Urban Case Study: South Korea

Since bag-based PAYT/VBWF was applied in 1995:

- *Per capita waste reduced by 26% to 2.2lbs/day*
- *Total recycling rate increased by 213%*



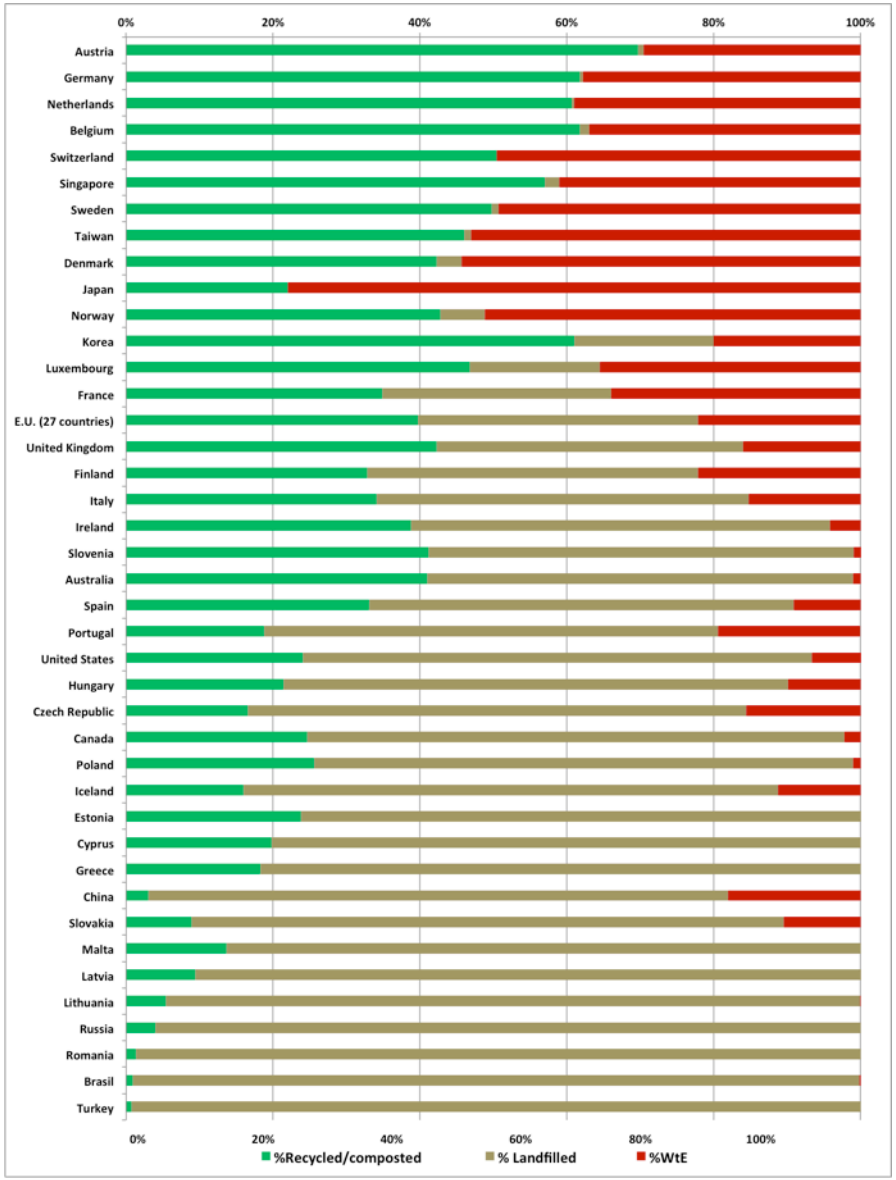
Urban Case Study: South Korea

Bags ranging from 3 liters ($0.06) - 100 liters ($2.10) available at stores

Recyclables and organics banned from MSW disposal

Yoonjun Seo: Current MSW Management and Waste---to---Energy Status in the Republic of Korea

Global Ladder of Sustainable Waste Mgmt



Sandwich. MA

South Korea

New York City

A.C. Bourtsalas and N.J. Themelis, Waste Management World, 2013

Challenges for New York City Market

Logistics

- Prevalence of multi-family buildings
- Imperative to collect all waste at curbside
- Collection fleet must function uniformly throughout city

Politics

- No tax line item – invisible costs
- Reform is politically charged
- Cost of recycling remains high

Priorities for NYC Program

- Encourages recycling and waste reduction
  - Fits existing collection infrastructure
  - Uniform program across the city

VBWF Applied to NYC Market

The future scenario:

- City mandates building owners discard MSW in licensed 30-gallon bags
- Tiered System
  - Initial allocation based on 50% recycling rate
  - Additional bags available for purchase
- Free recycling
- Escalating fines for noncompliant buildings

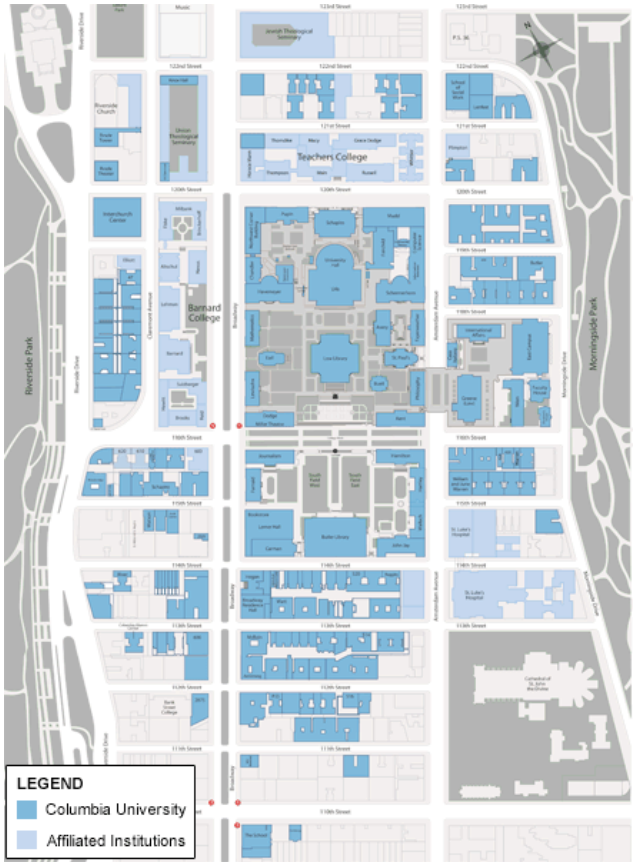
VBWF in NYC: Challenges

- Political pressure from property owners
- Potential for illegal dumping increases.
- Requires New enforcement system
- Residents in multi-family buildings insulated from the direct costs

VBWF Pilot Program: Morningside Heights

Columbia owns over 7,800 apartments serviced by DSNY curbside

Initial program would focus on participation and measurement, not yet charging for licensed bags



Goals

1. **Benchmark** changes in waste and recycling in select buildings at Columbia.

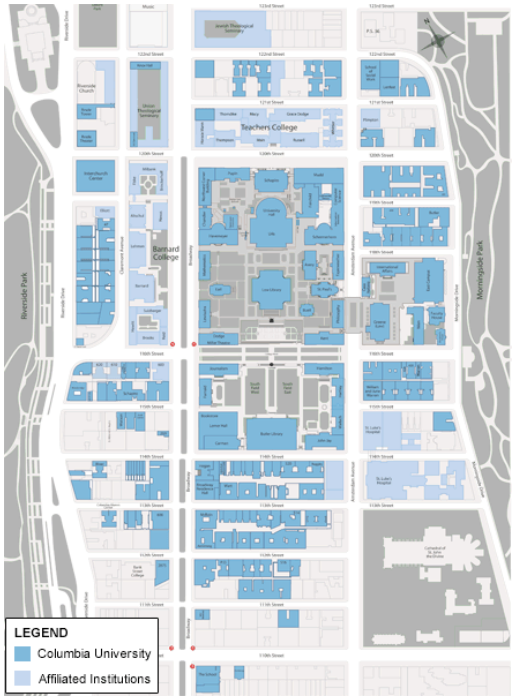
2. Determine **feasibility** of licensed MSW bags to support recycling.

VBWF Pilot Program: DSNY & Columbia

- Distribute specially marked, sequentially numbered 30-gallon bags to building managers/superintendents

- Incentive: Competition with prizes for building manager & residents who perform best

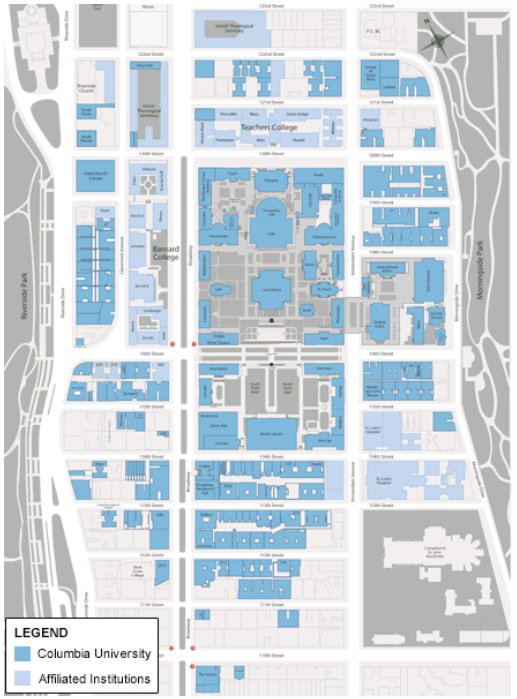
- Winners are buildings that
  1. Use fewest bags per unit
  2. Reduce MSW volume the most from baseline



VBWF Pilot Program: DSNY & Columbia

9-Month Trial for 2,000 Units

- **Market survey** with superintendents about waste volumes and bag usage
- **Procuring licensed bags** and organizing materials for building-level activities
- **Baseline survey**: 1 month of data from waste trucks serving Columbia, and on-street audits
- **Educational push** in buildings and distribution of materials to superintendents
- **Pilot program**: 4-month pilot program measuring bags used and volume of MSW/ recyclables
- **Results analysis** for future programs



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