



# AARPP – Assessments, Audits, Reinvestments, Piloting & Planning

*Doing what it takes to build a Zero Waste program*

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# Sandia National Laboratories – NM campus

- Campus facility, tenant on KAFB – over 800 buildings, over 17,800 acres
  - Campus arrangement offers challenges, but also affords many efficiencies
- Contractor to the Federal DOE – Federal laws apply as well as DOE orders and goals
  - Pollution Prevention Act of 1990
  - DOE Strategic Sustainability Performance Plan goals
- Buildings & Infrastructure – design, build, operate, maintain, **service**, renovate and demolish
  - SNL/NM Waste Management and Pollution Prevention Dept.



# Materials Sustainability & Pollution Prevention (MSP2)

- Vision - The MSP2 program promotes and integrates materials sustainability into all SNL/NM operations.



Reduce, Reuse, Recycle, Buy Green

- Part of SNL Environmental Management System; primary tenet is continual improvement in reducing environmental impact
  - e.g., pursue zero waste
- “You can’t manage what you don’t measure”



# Assessments

- FY04 Recycling Opportunity Assessment
  - Identified mixed paper as the prime opportunity
- FY09 Recycling Opportunity Assessment
  - Updated the FY04 ROA and expanded it to include over 50 different waste streams, primarily non-hazardous.
  - Low, medium and high priority action items
- FY13 Recycling Opportunity Assessment
  - Updated the FY09 ROA, provided status
  - Reassessed and revised actions items
  - Still has a wider focus than CSW



# Audits

- Waste Characterization Audit (2009)
  - At largest office building
  - At medium off-site office building for visiting researchers
  - At on-site cafeteria
- In pursuit of LEED<sup>®</sup> EB-OM certification (2010)
  - At small office building
  - Used similar protocol





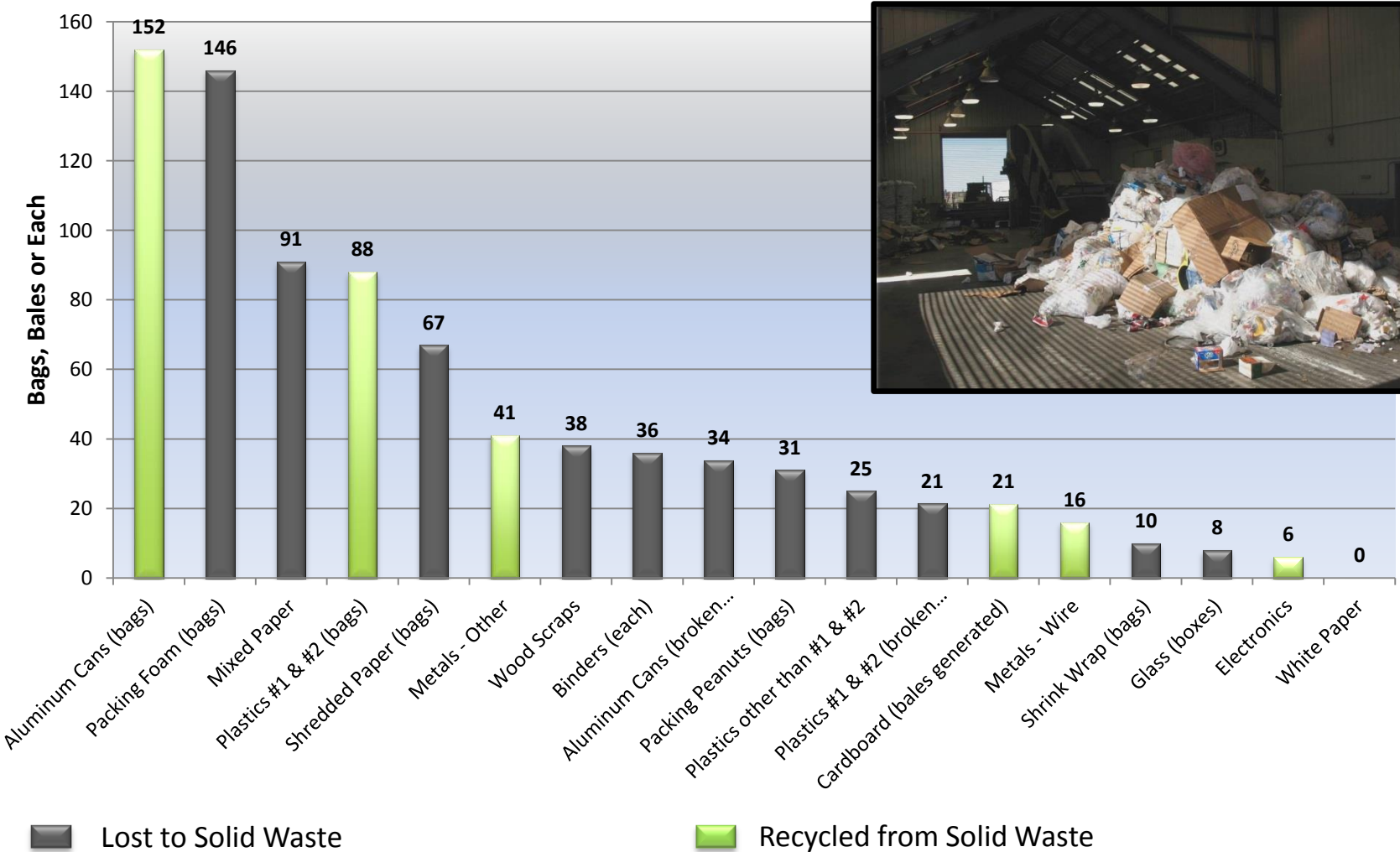
# Dumpster Assessment

- Trash, Cardboard (OCC) & Mixed Paper; in 2009
  - 25% OCC was being recovered from trash rather than through recycle dumpsters... so...
    - Rode the route a few times
    - Mapped all dumpsters in GIS (how initiated)
    - Removed excess trash dumpsters
    - Added more OCC dumpsters where needed
    - Upsized OCC dumpsters to reduce overflow to trash
    - Changed dumpster sizes at docks for easy top-loading





# Tipping floor assessment - 2011





# Waste Audit 2014 – Study\* Objectives

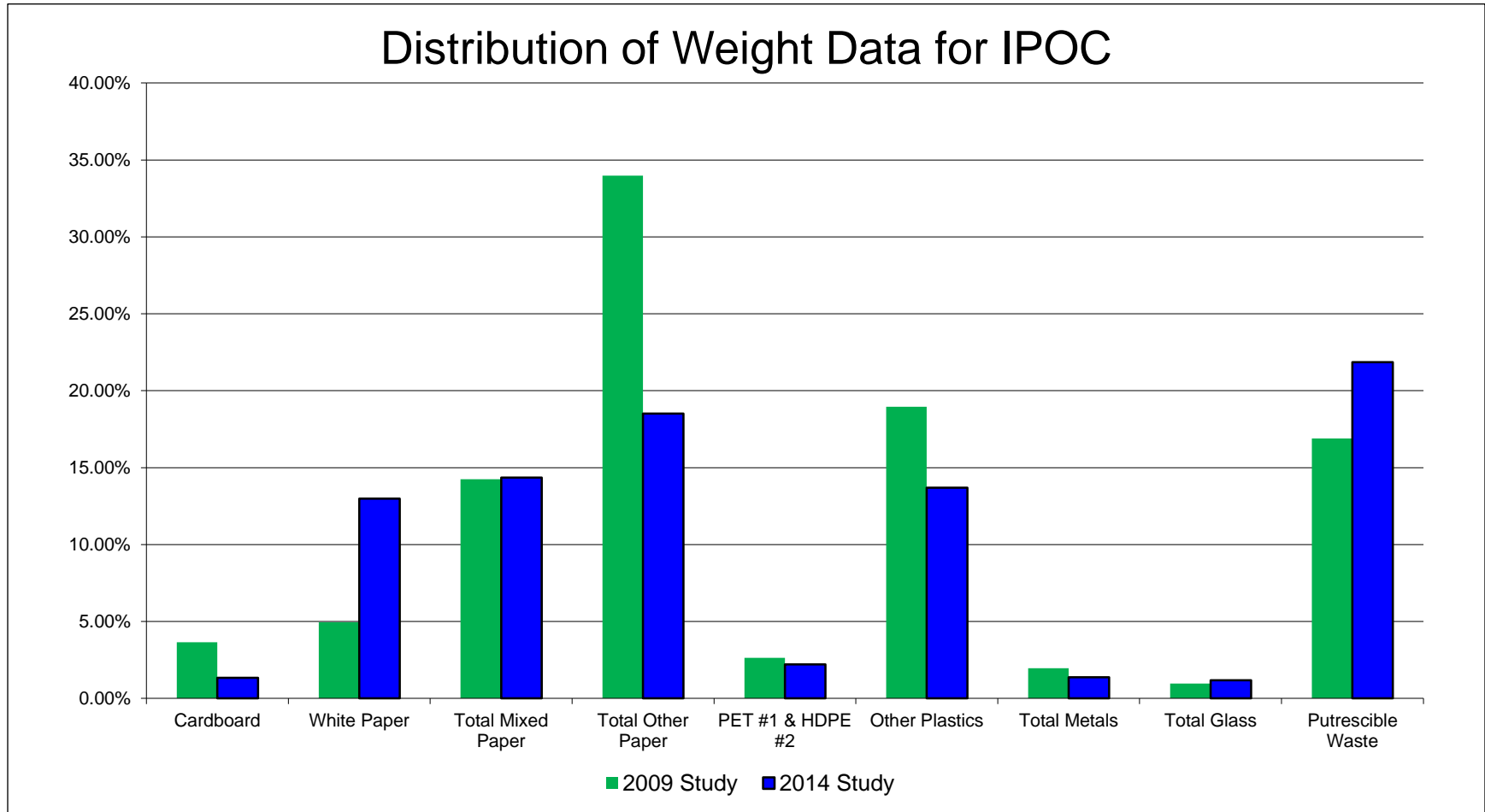
- Obtain representative estimate of the solid waste generated on a typical weekly and monthly basis for two off-base buildings, the full service on-base cafeteria and two on-base mixed use buildings
- Estimate the amount of recyclables in the waste stream at these facilities, with a focus on all paper/fiber types, #1&#2 plastics, #3-#7 rigid plastics, foam & stretch wrap, aluminum cans, other scrap metal (including office batteries)
- Assessing changes in the waste streams of the buildings audited in 2009



\*Conducted by Engineering Solutions and Design

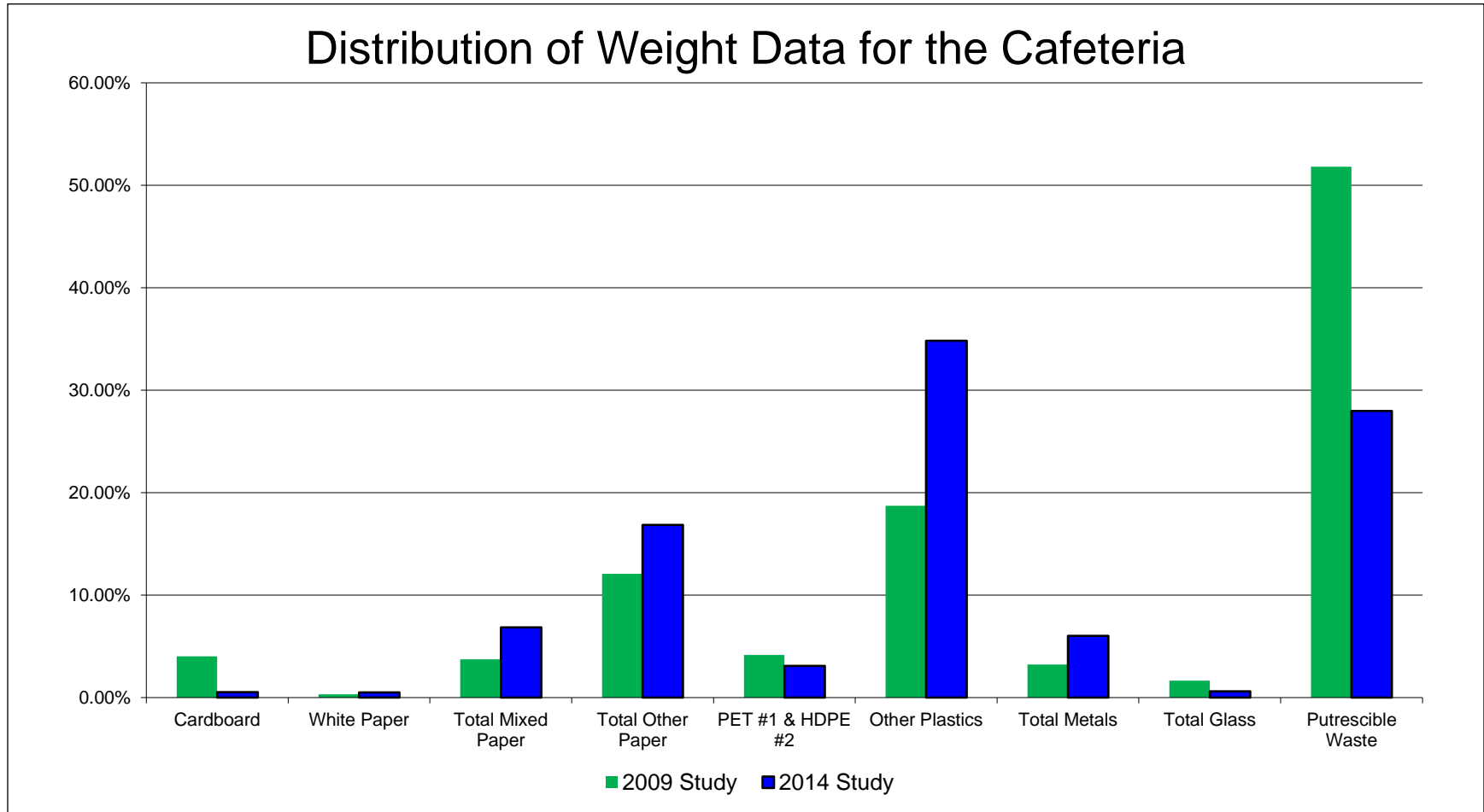


# Waste Audit 2014





# Waste Audit 2014





# Waste Audit 2014 – comparison of two office buildings

Component	Average Percentage*		
	823	831/832	Difference
Cardboard	6.91	8.72	1.81
White Paper	11.29	6.23	5.05
Wet Paper	14.88	9.33	5.55
Total Mixed Paper	25.76	29.39	3.63
Total Other Paper	14.90	9.39	5.51
PET #1	3.04	2.23	0.81
HDPE #2	0.48	0.64	0.16
Other Plastics	16.38	24.21	7.83
Aluminum Cans	1.22	0.87	0.35
Putrescible Waste	17.48	15.21	2.27

\* The average percentage for each of the waste stream components is calculated by adding the component's percentage of each sample and then dividing by the number of samples (in this case 3)



# Waste Audit 2015 – IPOC SFW2

- Prompted by two managers taking action after hearing briefing on ZW Strategic Plan
- Baseline in March 2015
- Measure progress by August 2015





# Waste Audit 2015

## Recyclable-at-IPOC Materials Found in Trash

- SFW2 is one sixth of the occupied area inside IPOC, and the population is almost evenly distributed.
- If all occupants' waste-generating habits were the same, 1/6 of total building's total "recyclables found in the trash" would be the expected value from SFW2.

Pounds/week	SFW2 Actual	SFW2 Expected	All IPOC 9/2014
Mixed paper	14.55	31.45	188.7
Rigid Plastics #1-7	6.85	19.2	115.2
White paper	6.56	28.4	170.4
E-Scrap	0.95	n/a	no data
Aluminum	0.62	1.55	9.3
Cardboard	0.40	2.95	17.7



# Reinvesting Recycling Revenues

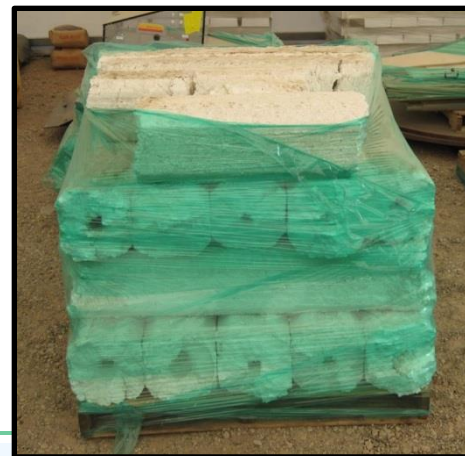
- Two Tents (storing, staging)
- Foam grinder/densifier machine
- Roll-offs and tilt hoppers
- Dumpsters & painting existing dumpsters
- Bins (battery recycling, composting)
- Stretch wrap machines
- Signs and labels
- Recycling Field Tech, van, tools
- Recycle streams that cost
- Occasionally:
  - Pallets (when needs exceed salvage)
  - Gaylord boxes
  - Outdoor bins (97% PCRC)





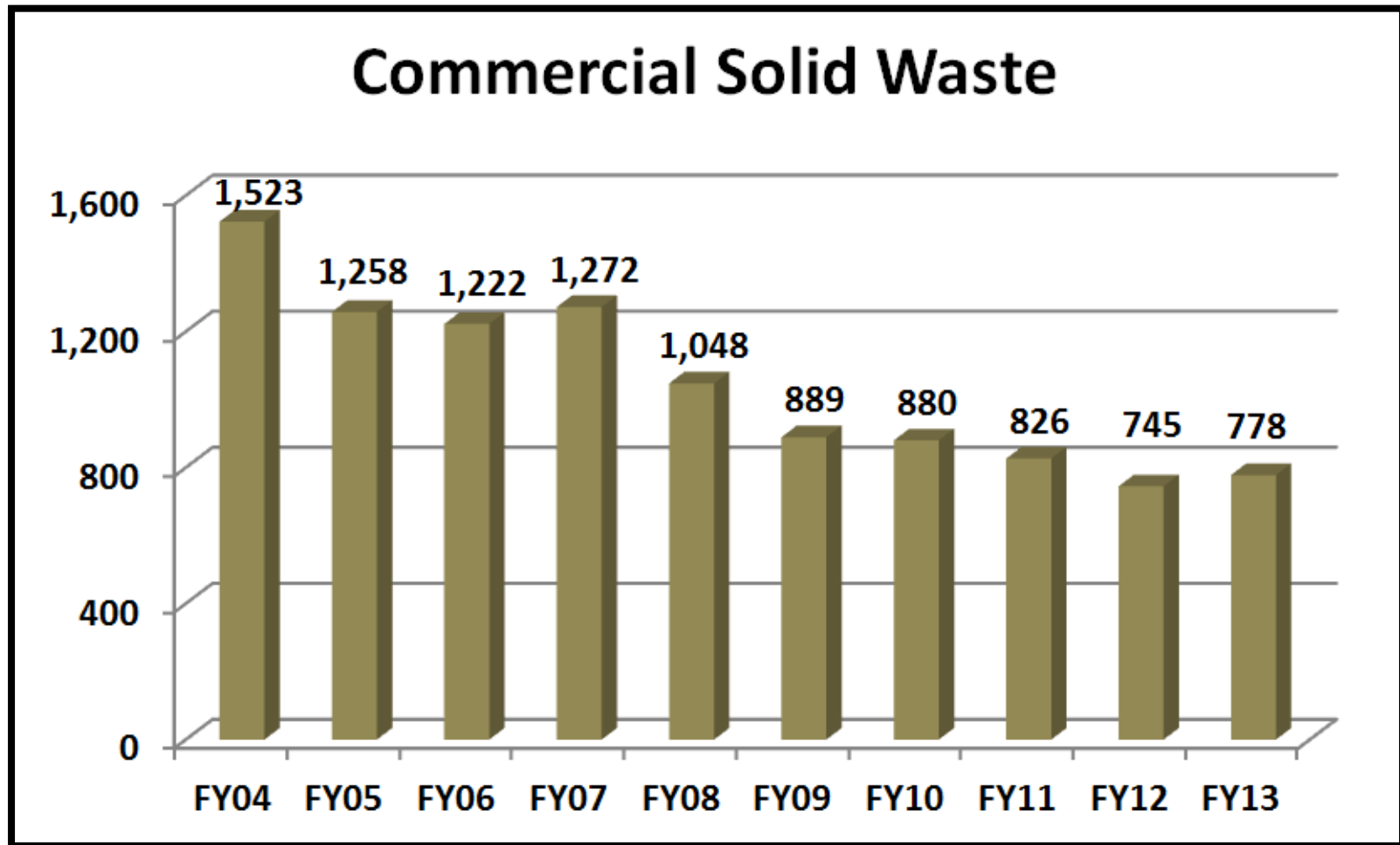
# Recycling – pilot efforts

- Mixed Paper initiated April 2008 with 8 re-painted OCC dumpsters
  - Resulting from 2004 ROA
  - Now up to 60 mixed paper dumpsters deployed
  - Volunteer at outset, now part of Custodial work plan
- Stretch wrap in 2009
- Alkaline batteries in 2009
- Composting in 2010 (after 2009 audit)





# SNL/NM Trend, in metric tons





# Zero Waste Planning

- Zero Waste by 2025 Strategic Plan – developed\* in 2014
  - Impetus – seems we have plateaued
  - Enlisted consultant expert in Zero Waste planning
  - Benchmarked with fellow Labs & other DOE sites
  - Onsite visit, interviews with staff, partners, participants
- Need to work on behavioral change as much as infrastructure
  - Outbrief with Direct and Upper Management
    - Very engaged, with one major piece of advice
- Zero Waste Communications Plan – developed in 2015
  - Multi-faceted, multi-media

\*SBM & Gary Liss & Associates



# Zero Waste Plan recommendations

## Tools for Ensuring Progress

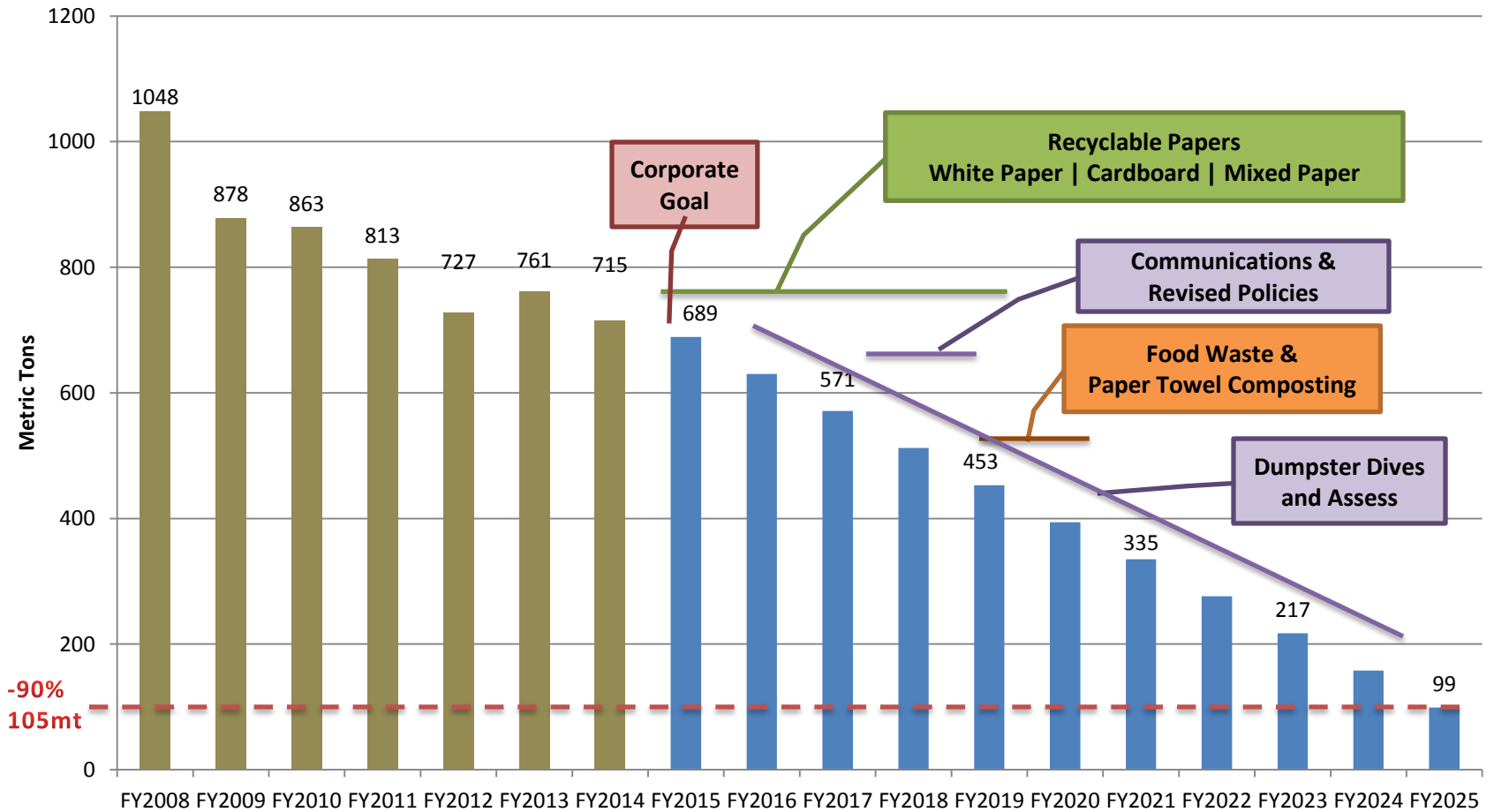
- Monthly Data Tracking
- Recycling Opportunity Assessment every 4 years
- Waste Characterization Study every 2-3 years
- Internal Waste Analyses annually
- Tactical Road Map – list steps required to complete the strategy
- Annual Budget - forecast of requirements and targets for upcoming year
- Semi-annual Business Review to leadership

## Next Steps

- Gain Executive Management Support for Zero Waste Corporate Goal
- Initiate steps for recycling improvements and compost expansion
- Determine team for branding, signage and education project
- Integrate findings from 2014 Waste Characterization Study
- Join USZWBC for info and to get certified



# Path to Zero Waste





## Questions or Comments?

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