Focusing on Beverage Container Recovery – New Research, Challenges, and Opportunities

NRC 24th Annual Congress

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Session Objectives

- Present detailed, new perspectives on beverage container generation and recovery
- Focus on unique analysis of where containers are consumed
- Explore challenges and opportunities in two main channels:
  - Residential
  - Workplace

Project Background

- Consulting team engaged by the Beverage Packaging Environment Council (BPEC)
- Support organization's efforts to increase beverage container recycling
- First public discussion of background research developed to educate/guide BPEC members

Research Areas

- Beverage containers in the waste stream
- Where containers are consumed
- Priorities for recycling efforts to increase rates

Some Definitions

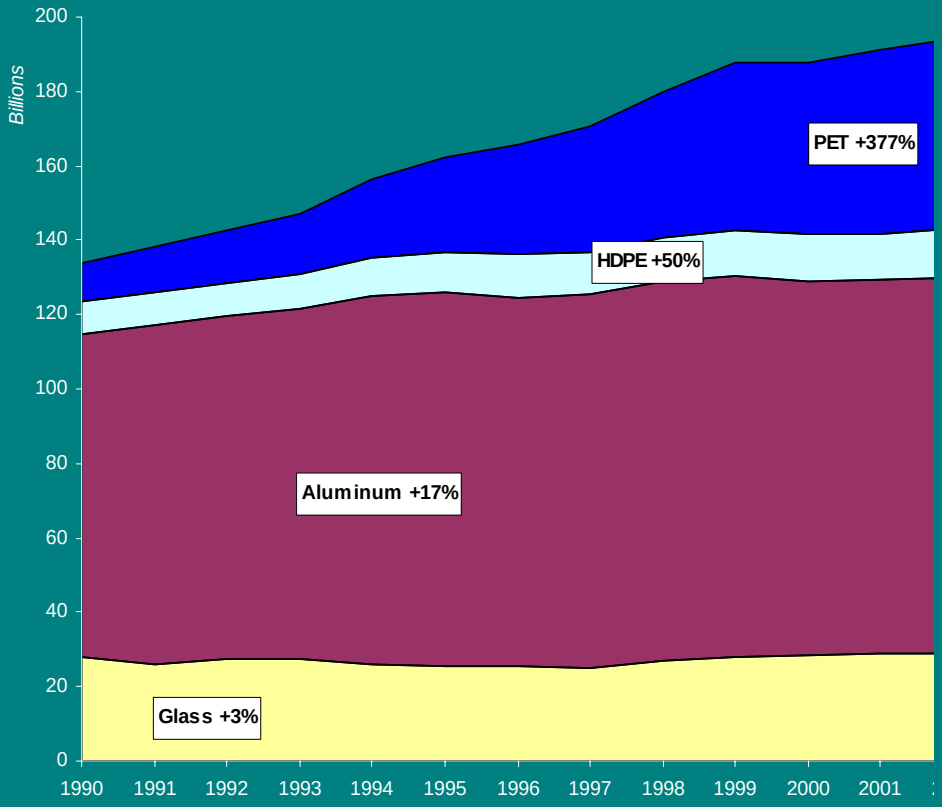
- What's a beverage container?
  - For our purposes, an aluminum can or a glass, PET, or HDPE bottle containing a RTD beverage of any type
- What's excluded?
  - Steel beverage cans, paperboard (gable-top) cartons, aseptic packaging (boxes, pouches), bulk packaging, secondary packaging

Data Sources

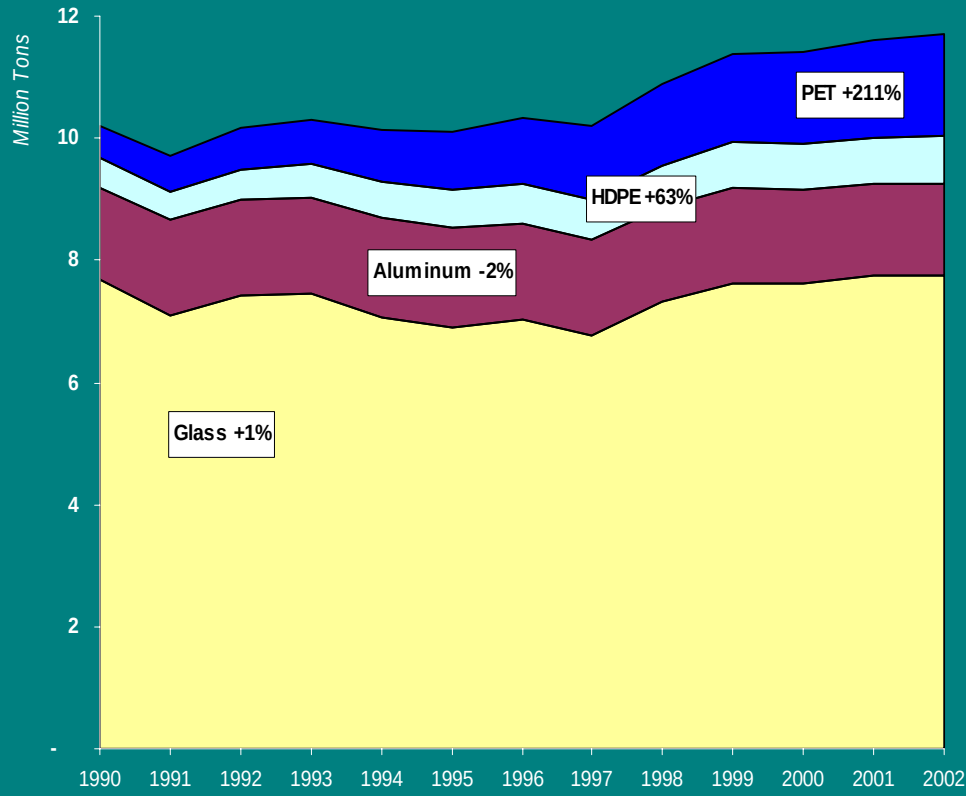
- Public sources
  - Annual supplier/trade association data on packages and/or weight sold and recycled
  - Purchased market research data
- Private sources
  - Industry surveys in deposit states
  - Point of consumption data from proprietary industry market research

Beverage Container Sales

All Containers +45% (25%/cap.)

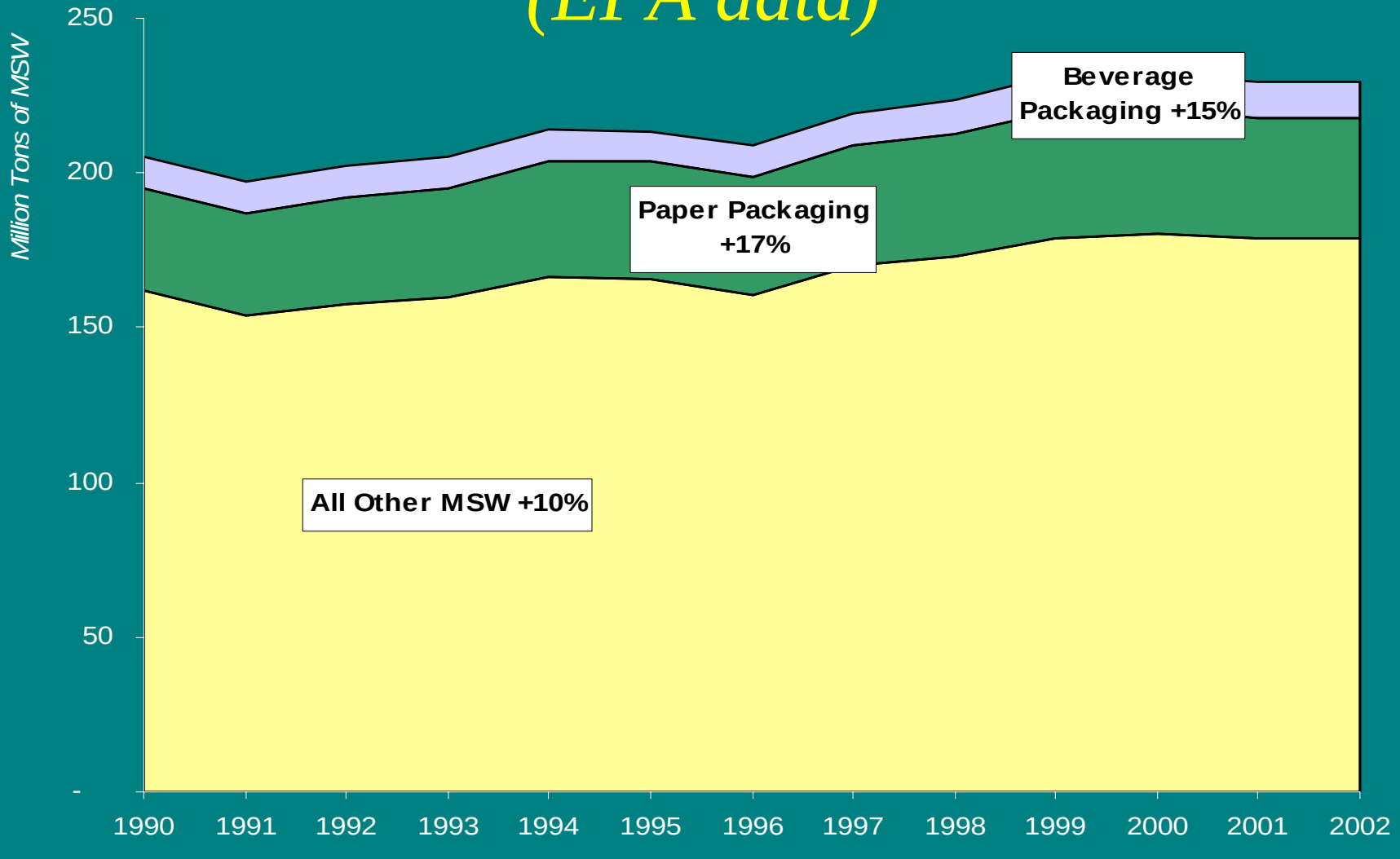


Weight +15% (0%/cap.)



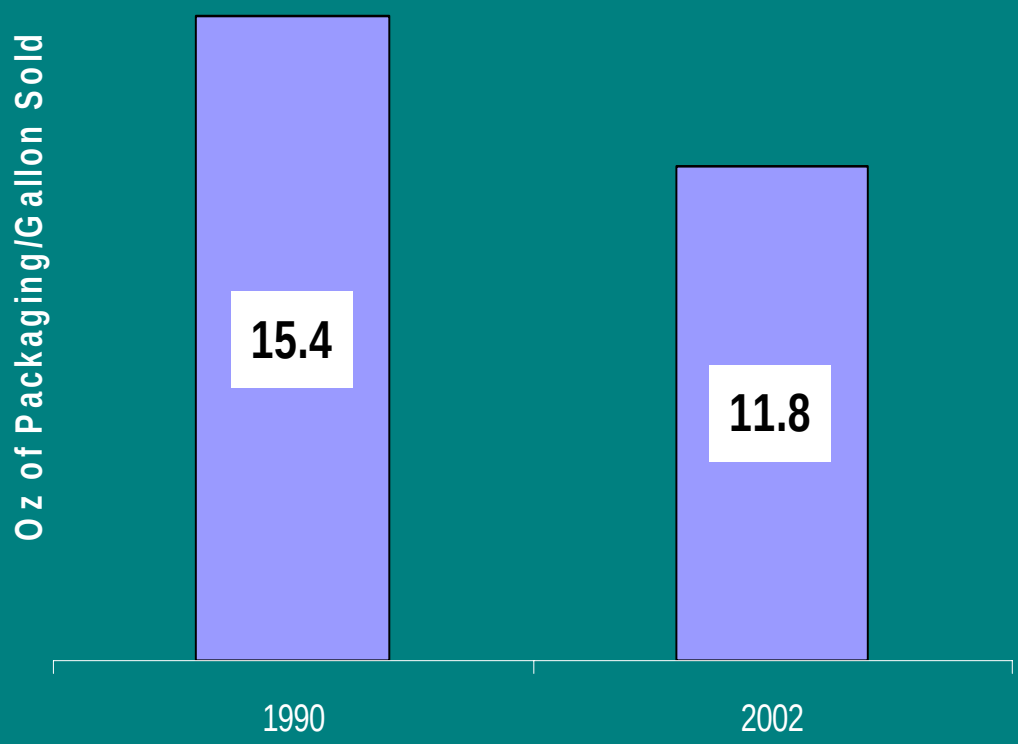
Beverage Packaging Holding Steady at 5% of MSW

(EPA data)



Improved Packaging Efficiency

- Packaged consumption of beverages
  - Up 45% 1990-2002
  - Up 25% per capita
- Packaging efficiency has grown 23%



The Single Serve Explosion?

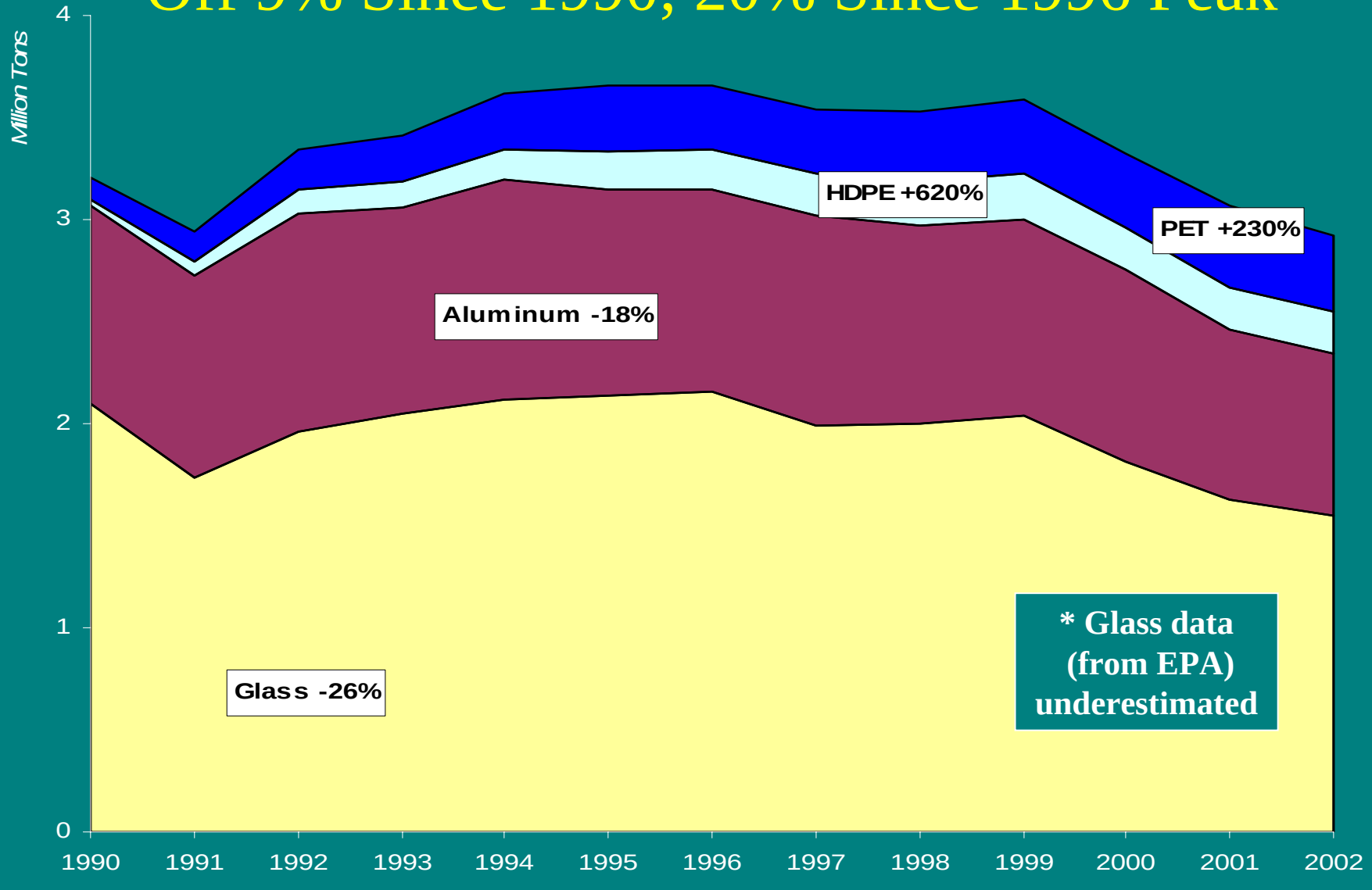
- Average beverage container size **unchanged** at 21 oz between 1990 and 2002

Explaining the Surprise

- Misperception comes from focus on specific material/product combinations, not big picture
- Water growth in PET; teas/fruit drinks in glass both dramatic, but modest impact on overall mix
- Cans and beer bottles still dominate
  - 75% of packages in 1990, 65% in 2002
  - CSD PET gains offset by losses in CSD glass
  - Beer glass sales growth largely unrecognized and offset by losses in cans

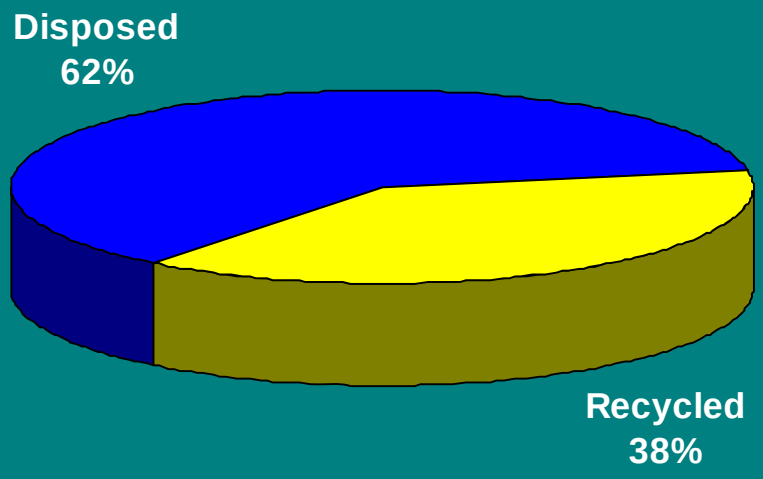
Tons Recycled:

Off 9% Since 1990; 20% Since 1996 Peak

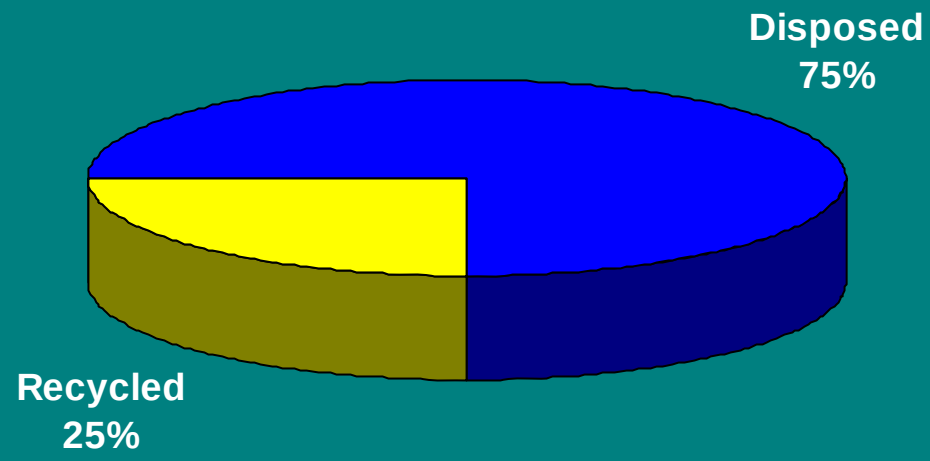


2002 Recovery Rates*

Container-Based



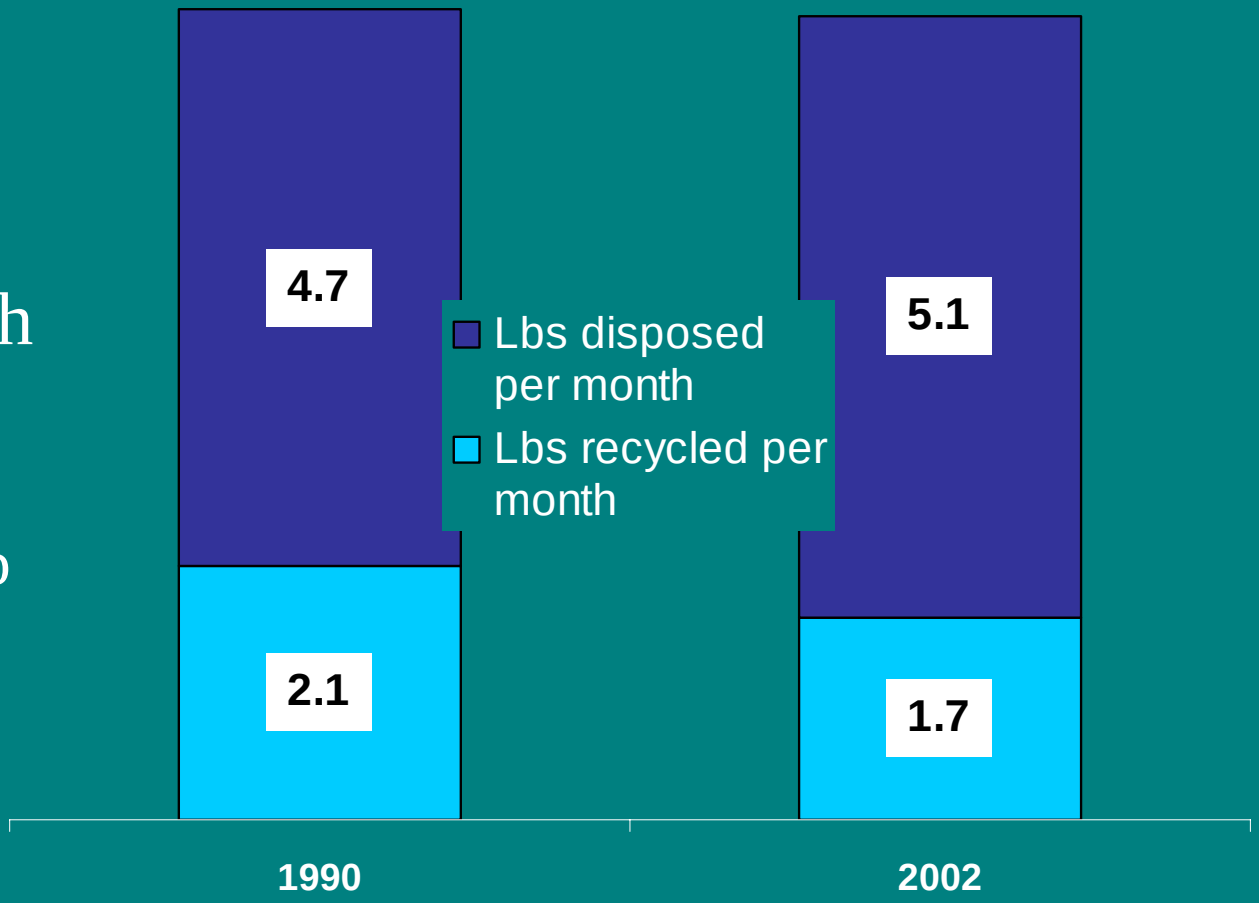
Weight-Based



* *Both pulled down by underestimated glass rate, but weight-based is more affected by it*

Average Consumer Behavior

- Containers purchased steady at 6.8 lbs per month
  - Recycling down 19%
  - Disposal up 9%



Where Containers Are Consumed

- First-ever access to industry marketing data
- Unique and unprecedented perspective on potential for recovery
- Identifies where product is *consumed* – not where it is *purchased (i.e.*, where empty container could first be captured for recycling)
- Critical to targeting options

Data Development - Generation

Beverage sales – tons from supplier data

Beverage sales – units from suppliers, packaging data, NB surveys

Reconcile totals to generate matrix of sales

Package Material and Size	**Product Category** *(ctrs and weight)*					
		CSD	Beer	Water	Juice	Etc
	Alum 12 oz					
	PET 8 oz					
	PET 12 oz					
	PET 0.5 l					
	PET 20 oz					
	Etc.					

Marketing data – share of units sold for each cell of matrix (e.g., CSD aluminum 12 oz)

% Home

%Office

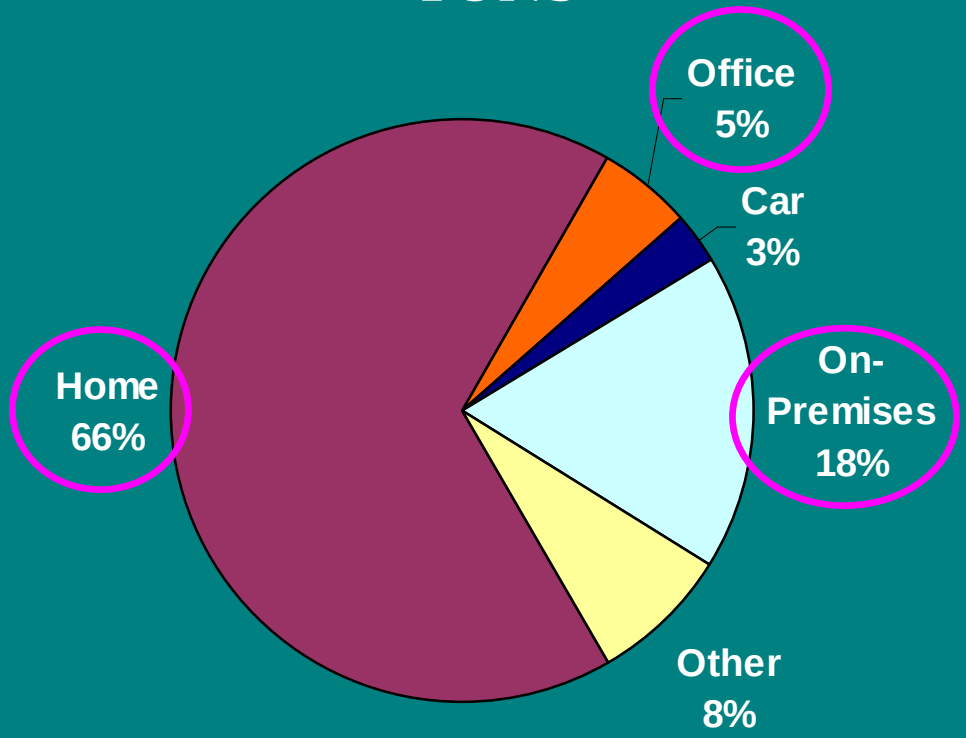
% Car

% On-premises

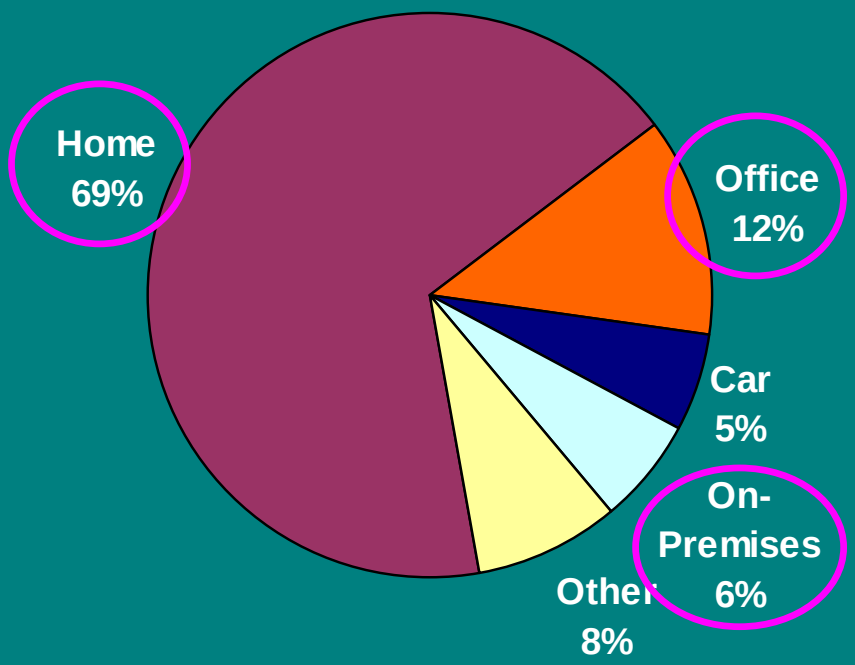
Aggregate aluminum, glass & PET tons and containers by point of consumption

Where Beverage Containers Are Consumed

TONS



CONTAINERS

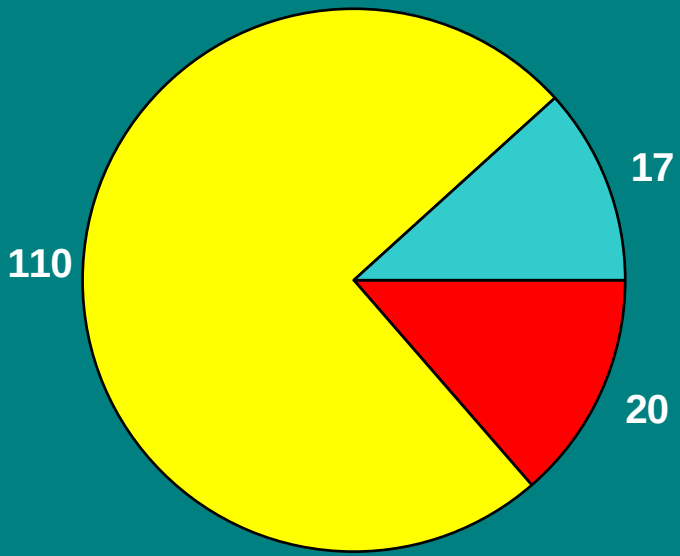


Point of Consumption Lessons

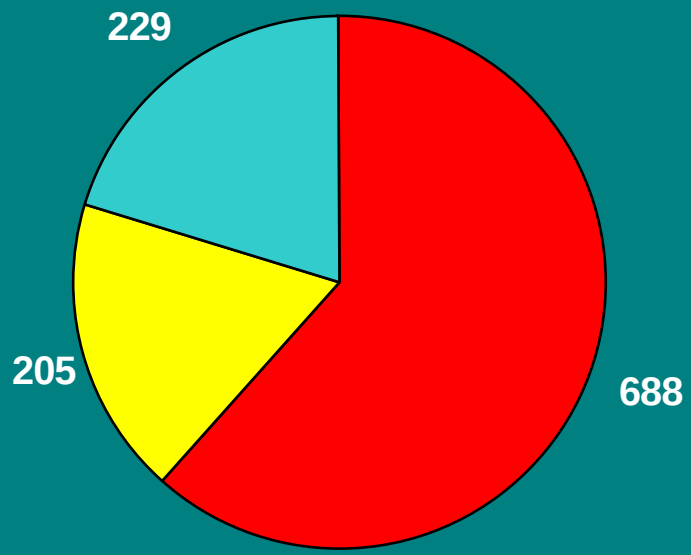
- Home still dominates – for every material by container or weight
- Workplace and on-premises are #2 and #3
- 3 top sites
  - 89% of tons
  - 87% of containers
  - More developed recovery infrastructure
- Remaining locations
  - Potential for litter
  - Car is largest plus others (parks, beaches) with infrastructure challenges

What's Consumed At Home?

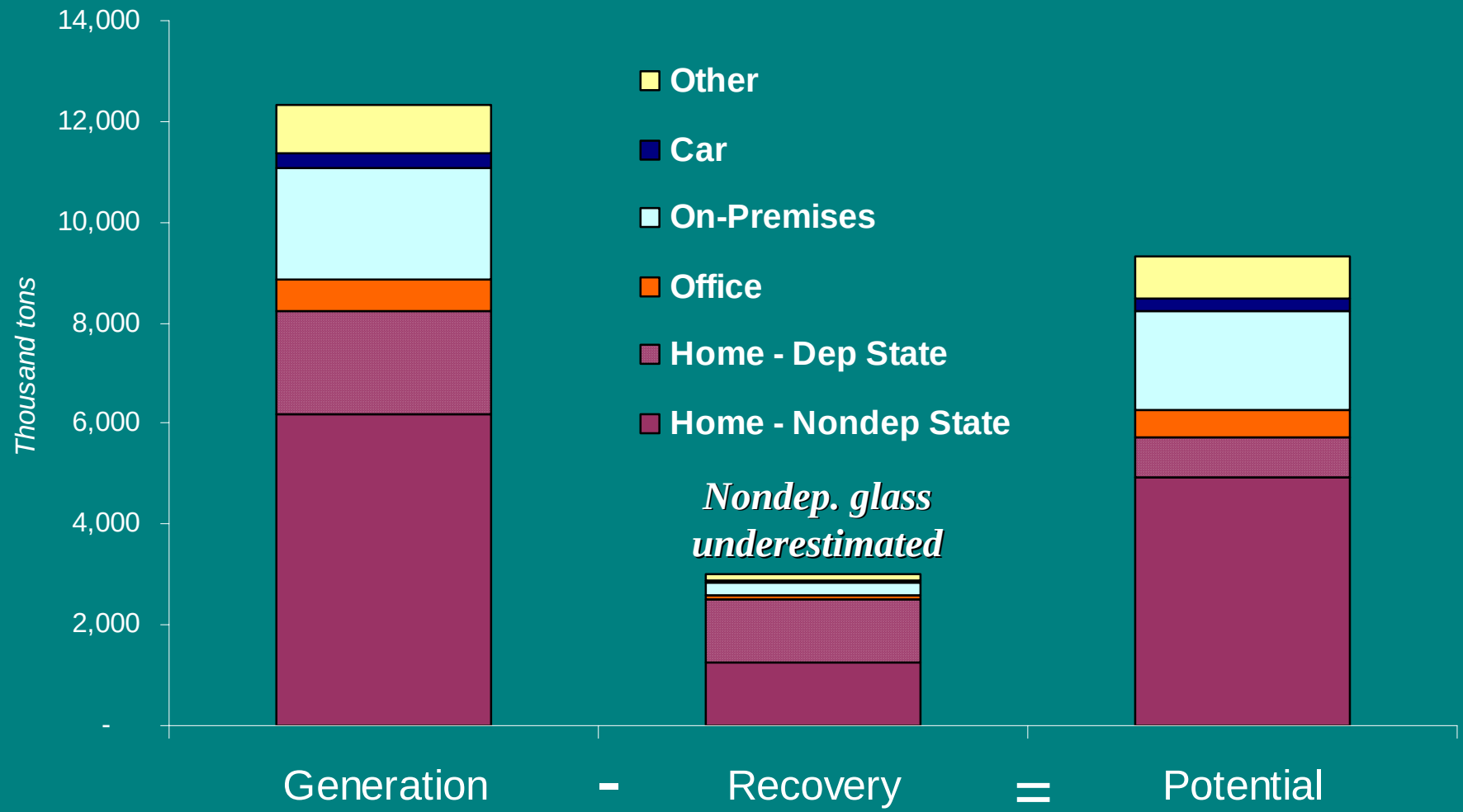
67% of All Pounds
(148 Pounds per Household per Year)



68% of All Containers
(1,100 Containers per Household per Year)

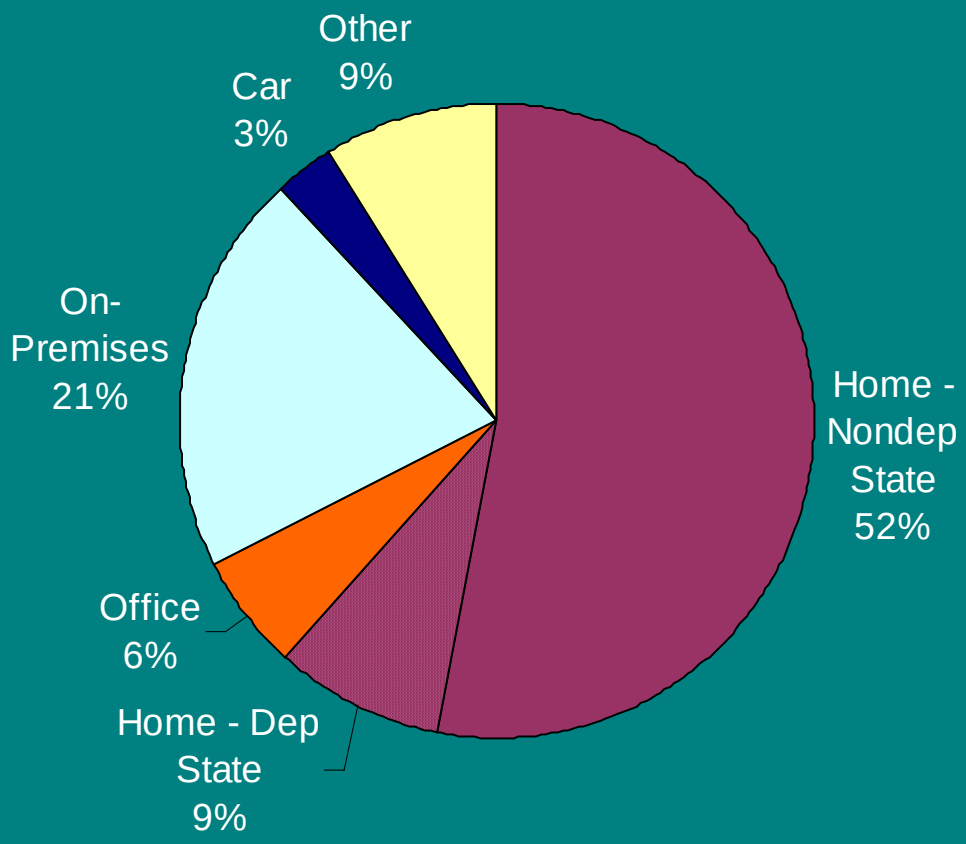


Potential Recovery (Tons)

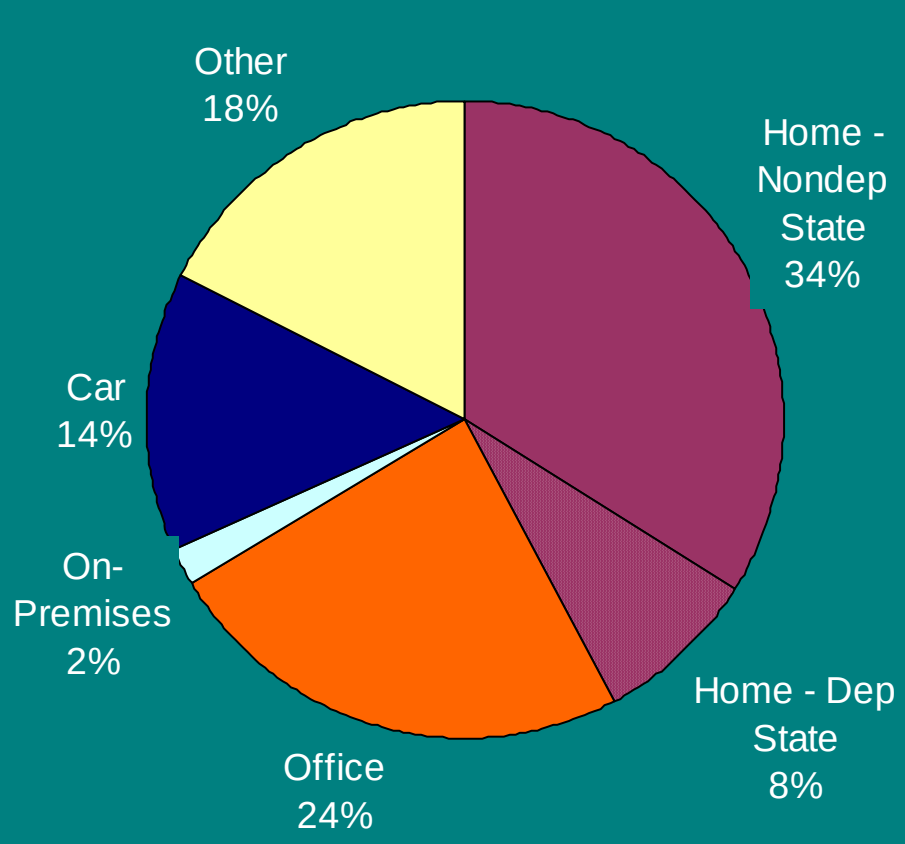


Potential Recovery

Weight



Containers



Increasing Recovery of Beverage Containers from Households

Questions

If most beverage containers are still consumed at home, and most households (56% *BioCycle*, AF&PA) have curbside collection:

Why isn't the recycling rate higher?

and

What can be done about it?

First, Data Issues

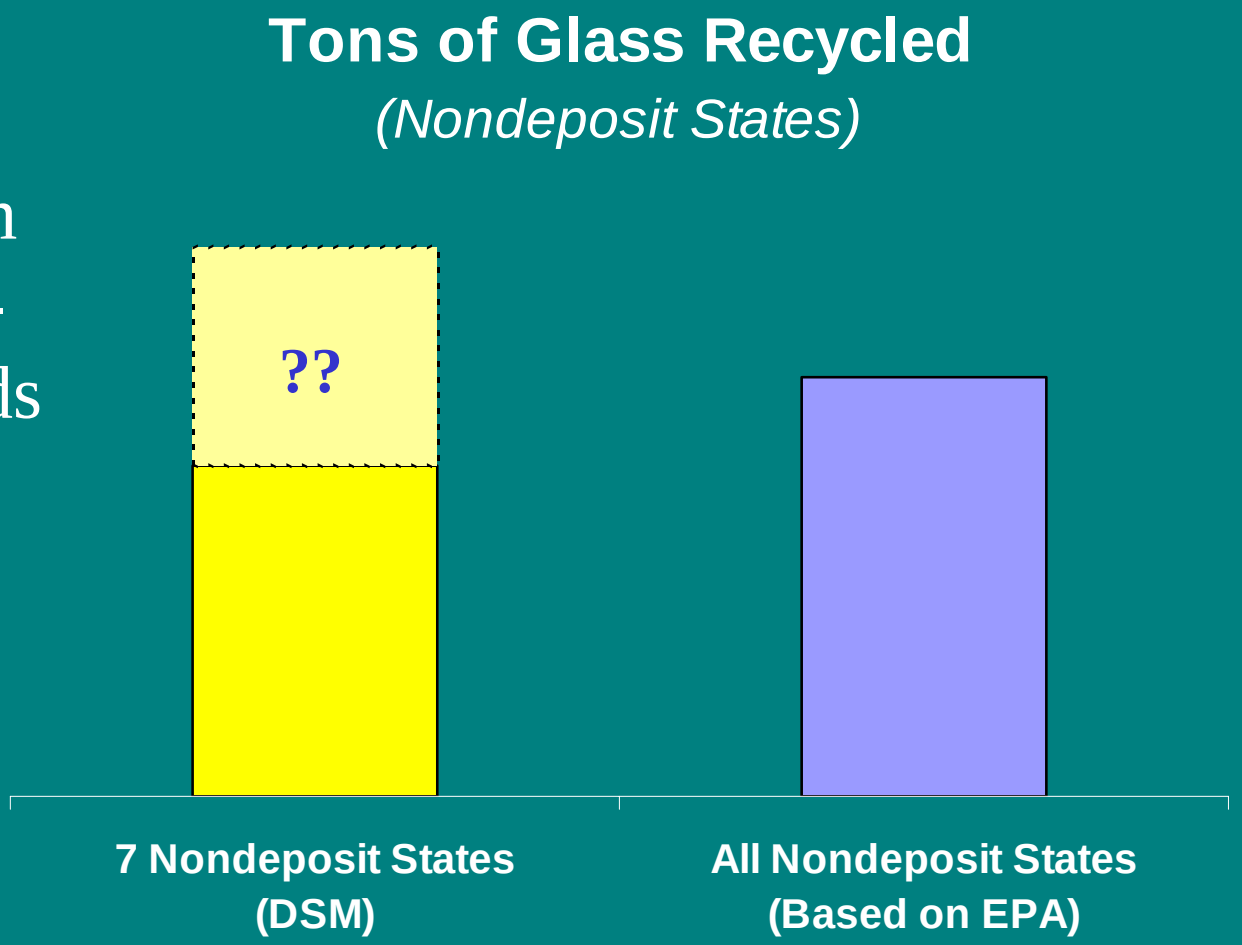
- Understated glass recovery rate
- Poor data surrounding curbside recycling service and curbside trash collection

Glass Data

- Existing (EPA) approach may miss significant amounts of glass recycling
  - No industry-wide glass recycling data
  - Significant amount to aggregate
- State data are limited
  - No systematic collection
  - State definitions and tracking vary widely
  - Recovery of glass for non bottle uses not measured or counted by some states

We Think Glass Recovery Is Significantly Under-Reported

- Sample data from only 7 of 39 non-deposit states adds up to 79% of the estimated nondeposit state total



Poor Curbside Collection Data

- Recycling
  - *Biocycle* survey is valuable, but limited
  - Most states do not collect reliable data on curbside access
  - Some reported access is subscription
  - Some programs may not offer bins, reliable service, or education
  - Some don’t collect glass or plastic
- Refuse
  - No good access numbers (we estimate at ≈ 80%)
  - Access indicates potential for recycling collection as well

Those With Curbside Access Could Recover Much More

- 56% of population has some access to curbside recycling, but:
  - Subscription = only 7% to 15% participation
  - Poor outreach, no bins, poor scheduling = low performing programs
- Curbside *refuse*, but dropoff *recycling:*
  - Only 10% to 20% participation

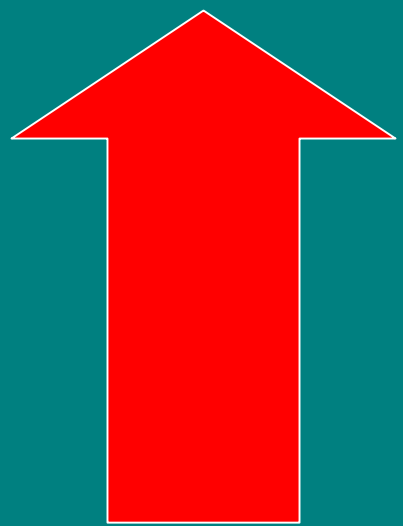
Our Best Guess

- Only about ½ of curbside households have same day collection for beverage containers

Data Needs

- To improve understanding of issue and improve response to problems:
  - Better glass recovery data
  - More refined recycling access information – not all served by “best” programs
  - Refuse collection service

Increasing Recovery of the 52% of Beverage Container Material in Non-Deposit Households



Key Is Parallel Access

- Estimate that 80% +/- of households have curbside (or containerized) refuse collection
- Highest recovery (beverage and other) requires same day curbside recycling collection

Estimated Household Recycling and Refuse Systems in Non-Deposit States

Collection Systems	Percentage
Curbside Refuse (78% overall)	
Dropoff recycling	33%
Subscription curbside recycling	11%
Non-subscription curbside recycling	
High performing	7%
Medium performing	21%
Low performing	7%
Dropoff Refuse (22% overall)	
Dropoff recycling	16%
No recycling	5%
Total, Non-Deposit States	100%

Totals do not add due to rounding

Expected Household Recycling Program Performance

Collection Systems	Participation	Capture	Recovery
Curbside Refuse			
Dropoff recycling	15%	60%	9%
Subscription curbside recycling	10%	80%	8%
Non-subscription curbside recycling			
High performing	80%	80%	64%
Medium performing	60%	75%	45%
Low performing	40%	60%	24%
Dropoff Refuse			
Dropoff recycling	65%	75%	49%
No recycling	5%	75%	4%

Allocation of 52%…Where The Remaining Tons Are

Collection Systems	Percentage
Curbside Refuse (78% overall)	
Dropoff recycling	39%
Subscription curbside recycling	14%
Non-subscription curbside recycling	
High performing	4%
Medium performing	16%
Low performing	7%
Dropoff Refuse (22% overall)	
Dropoff recycling	12%
No recycling	7%
Total, Non-Deposit States	100%

Optimizing Recovery

- Parallel collection systems
- Properly sized recycling set-out containers
- PAYT, or other financial incentives
- Simple, consistent messages
- All containers included in collection
- Single stream collection
- Adequate education and promotion budget

Potential Impact

- Increase beverage container recovery by 1.9 million tons (+ 20 percentage points)
- Increase recovery of non-beverage containers
- Leverage 5 to 7 million tons of additional paper recovery

Conclusions

- There is plenty of low hanging fruit left in household refuse
- Expanding curbside recycling would
  - Substantially boost rates for containers
  - Substantially increase paper recovery
  - Move US toward a more sustainable materials recovery system

Workplace Beverage Container Recycling

Issues and Opportunities

Presentation Overview

- **Recycling Potential**
  - Quantifying opportunities for container recycling in the workplace
- **Models**
  - Model programs for workplace recovery
- **Issues**
  - Issues that must be addressed to move forward

Current Status

- **Limited infrastructure for container recycling:** cardboard, paper much more extensive
- **Programs vary widely:** from mandatory recycling, full collection service, technical assistance to very limited or no collection
- **Limited data available** on number of businesses served, participation rates

Containers in the Workplace

	Generation – Total Consumption		**Potential (Not Recovered Today)**
	% of Generation	Containers per Employee	% of Potential
PET	20%	90	24%
Aluminum	12%	107	19%
Glass	2.3%	7	2.5%

High Potential Opportunities

- **Metropolitan areas where businesses, containers, and infrastructure are concentrated**
  - Largest Metropolitan Statistical Areas (MSAs)
  - Non-bottle bill states
  - Some infrastructure exists for recycling
- **Businesses where containers are concentrated**
  - Larger firms (>20 employees)
  - Office, institutional, retail, manufacturing (exclude construction, restaurants, hotels)
- **25% of employees/containers in 12 MSAs; 50% in top 44**

Assessing Potential Impacts – Largest 44 MSAs

	Deposits	Non-deposit	Totals
More Commercial Programs in Place	7	15	22
Fewer Commercial Programs in Place	6	16	22
Totals	13	31	44

Potential Recovery Impact

- 15 MSAs only
  - 6,700 tons of aluminum
  - 11,000 tons of PET
  - 7,400 tons of glass
- Impact on recovery in target cities
  - 2% increase in beverage container rate (by weight)
  - 4% increase in beverage container rate (by container)
  - 7% increase in PET containers recovered

Model Programs

- Keys to success:
  - Convenience/access
  - In-house champions
  - Cost-effectiveness
  - Management commitment

Models

- Commingled collection
  - Containers collected with paper; requires coordination with paper recyclers to address separation/processing issues
  - Leverages existing infrastructure; likely the least cost solution
- “Bundled Recycling” collection & rate structures
  - Recycling collection provided to all businesses in service territory
  - Paid for through garbage rates; similar to residential recycling
  - Requires municipal contract or ordinance
- Curbside service for smaller businesses
  - Use of toters; serviced through residential contracts
- Mandatory recycling/Disposal bans
- Resource management contracting

Issues & Challenges

- **Data gaps -** Lack of data on services, recovery levels, programs, cost, effectiveness
- **Indifference -** Commercial recycling not a priority for public sector recycling coordinators; private sector focused only on paper
- **Sorting/separating** – Containers from fiber
- **Infrastructure** – Collection & processing
- **Engagement** – How best to engage businesses
- **Cost/economics** – Encouraging local, least-cost solutions

Conclusions

- Productive channel to capture containers, especially PET and aluminum
- Start in larger MSAs with some infrastructure in place targeting larger offices
- Refine/develop model programs
- Improve data
- Separation issues
- Facilitate partnerships, coordination, incentives, and investment

Session Summary

- Perspectives
  - Beverage containers steady at 5% waste stream
  - Single serve issue overemphasized on beverage container generation and recovery
- Point of consumption
  - Home dominates by all measures
  - Office and on-premises strong second and third
- Plenty of low-hanging fruit still in residential
- Workplace a productive channel to capture containers, especially PET and aluminum