



LESS IS LESS:

GARBAGE IN AMERICA

NEW ERA: NO LONGER THE SAUDI ARABIA OF TRASH

WHY DOES THIS MATTER?

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- “Commissioners discuss solid waste shortfall.”

COMMON WASTE-RELATED HEADLINE THESE DAYS

- ALSO SEEING IT IN RELATION TO LESS MATERIAL IN CURBSIDE RECYCLING PROGRAMS

WHAT ARE THE IMPACTS OF LESS WASTE ON YOUR RECYCLING & WASTE MANAGEMENT OPERATIONS?

CAVEAT: LOTTA FACTOIDS, DON'T WORRY SO MUCH ABOUT DETAILS – I AM MORE INTERESTED IN PAINTING A PICTURE.

SEGUE: LET'S START WITH OUR RAW MATERIAL

OUR RAW MATERIAL



- 4.40 pounds *every day*.
- 97 pounds/week average family
- *250 million tons a year*.

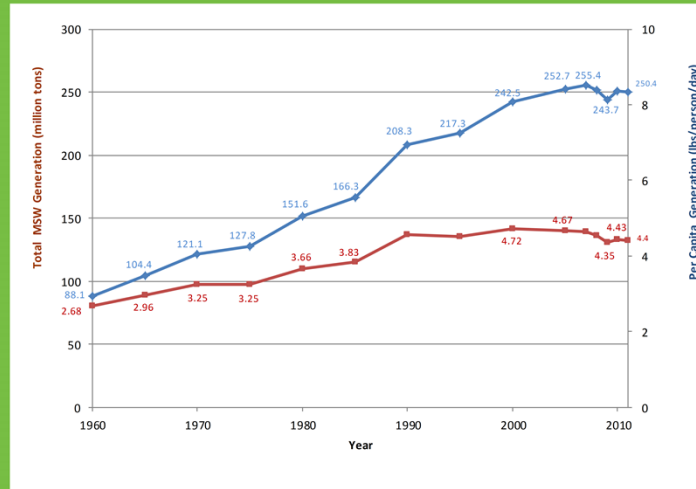
4.40 POUNDS PER DAY

97 POUNDS PER WEEK AVERAGE FAMILY (3.14 PEOPLE)

- 79.5 POUNDS PER WEEK AVERAGE HOUSEHOLD (2.58 PEOPLE)

250 MILLION TONS A YEAR OF WASTE PRODUCED BY HOMES, BUSINESSES, RESTAURANTS, ETC.

MSW GENERATION RATES



EPA DATA 1960 – 2011

NOTE THAT TOTAL WASTE PEAKED IN 2005
PER CAPITA WASTE PEAKED IN 2000

WASTE GENERATION IS A FUNCTION OF POPULATION GROWTH, THE
ECONOMY & HOW WE USE MATERIALS

IN THE PAST, POPULATION & ECONOMIC GROWTH MEANT MORE GARBAGE
OVERALL

THAT IS NO LONGER THE CASE

NOTE HOW MUCH GARBAGE GREW BETWEEN 1980 & 1990

- & HOW THE GROWTH SLOWED DOWN BETWEEN 1990 & 2000
- & VIRTUALLY STOPPED B/W 2000 & 2011

WHAT COULD HAVE BEEN



- 1990: 208.3 million tons
- 2000: 286.2 million tons (projected)
- 2000: 243.5 million tons (real)
- 2000: **42.7 million ton shortfall**

IF THE WASTE STREAM HAD GROWN FROM 1990 TO 2000 AT THE SAME PACE AS FROM 1980 TO 1990 (37.4%) WE WOULD HAVE PRODUCED AN EXTRA 42.8 MILLION TONS OF GARBAGE IN 2000

WHAT COULD HAVE BEEN



- 2000: 243.5 million tons
- 2010: 250.4 million tons (actual)
- 2010: 284.6 million tons (projected)
- 2010: **34.2 million ton shortfall**

& IF THE WASTE STREAM HAD GROWN FROM 2000 TO 2010 AT THE SLOWER PACE OF THE PREVIOUS DECADE (16.9%), WE WOULD HAVE PRODUCED AN EXTRA 34.2 MILLION TONS OF WASTE

SEGUE: WHY DIDN'T WE?

(NOTE: IF QUESTIONS ARISE ABOUT STATE DATA VS EPA DATA: COLLECTIONS OF STATE SOLID WASTE DATA SHOW HIGHER WASTE GENERATION TONNAGES. IS THAT BETTER DATA THAN EPA'S? NO! STATE 'S DEFINE & REPORT SOLID WASTE DIFFERENTLY.

IN THE LAST PUBLISHED STATE DATA REPORT OF PER PERSON YEARLY WASTE GENERATION

- *ARKANSAS IS 1.64 TONS*
- *LOUISIANA , OKLAHOMA , MISSISSIPPI & MISSOURI ARE 1.32 , 1.21 , 0.92 & 0.82 RESPECTIVELY*
- *WHAT ELSE CAN EXPLAIN SUCH WIDE DIFFERENCES B/W NEIGHBORING STATES?*

WHY LESS WASTE?



- Evolving ton
- Source reduction
- Zero waste
- Recycling/composting? No!
- Recession? No!

EVOLVING TON (REPUBLIC SERVICES COINED THIS TERM)

SOURCE REDUCTION

ZERO WASTE

WE RECYCLED & COMPOSTED MORE IN BOTH DECADES

- BUT THOSE ARE MANAGEMENT, NOT “LESS WASTE” TECHNIQUES

THE RECESSION WAS A FACTOR AFTER 2008

- BUT HAD AT MOST A MINOR IMPACT ON MSW
- BIG IMPACT ON C&D
- 90's A HOT ECONOMY BUT WASTE GENERATION SLOWED DOWN

OTHER FACTORS MORE PROMINENT

SEGUE: LET'S LOOK AT THESE MORE CLOSELY STARTING WITH THE EVOLVING TON

THE EVOLVING TON



- Less paper
- More plastic
- Electronics
- Future products?

OUR RAW MATERIAL IS CHANGING DRAMATICALLY

LESS PAPER, MORE PLASTICS, LESS HEAVIER PACKAGING

NEW PRODUCTS DISPLACING OLD

PAPER: 2000 - 2011



- 17, 640,000 tons less
- 20% decrease
- Mostly printed paper

NOT USING PAPER TO TRANSMIT KNOWLEDGE – USING BITS & BYTES INSTEAD

VIRTUALLY ALL OF THE PAPER LOSS IS IN PRINTED GRADES:

- NEWSPAPERS & MAGAZINES
- PRINTING & WRITING PAPER

ANOTHER 10 – 20% DECLINE IN 2012 & SMALLER DECLINE THIS YEAR

PAPER PACKAGING DOWN 1.9 MILLION TONS

- *CORRUGATED BOXES DOWN 770 ,000 TONS (2.3%)*
- *PAPER BAGS DOWN 740 ,000 TONS: 50%*

TISSUE PAPER, PAPER PLATES, ETC. UP SLIGHTLY

- *360,000 TONS (4%)*

GLOBAL PRODUCTION UP 0.2% PACKAGING & TISSUE UP GRAPHIC PAPER DOWN

PLASTIC: 2000 - 2011



- 6,290,000 tons more
- 25% increase

PLASTIC UP 6.2 MT: 25%

PACKAGING BIGGEST COMPONENT: 44%

- *UP 25% OR 2.7 MILLION TONS BETWEEN 2000 & 2011*

DURABLES NEXT: 36%

NONDURABLES : 20% (PLATES, CUPS, TRASH BAGS, DISPOSAL DIAPERS, CLOTHING, FOOTWEAR, ETC.)

OTHER



- Metals: more
- Textiles: more
- Wood: more
- Food waste: more
- Yard waste: more
- Glass: less

2000 – 2011:

PAPER & GLASS LOSSES SLIGHTLY GREATER THAN THE COMBINED INCREASES IN METALS, TEXTILES, WOOD, FOOD & YARD WASTE

- *NOTE GLASS CONTAINERS MOSTLY USED FOR BEVERAGES*

*METALS UP 3.1 MT
TEXTILES UP 3.0 MT
WOOD UP 2.5 MT
FOOD WASTE UP 5.6 MT
YARD WASTE UP 3.2 MT
TOTAL: 17.4 MT*

GLASS DOWN 1.3 MT

ELECTRONICS



ELECTRONICS: TOP VS BOTTOM

- CELL PHONE – VIDEO CAMERA – LAPTOP – PHOTO CAMERA – WALKMAN – WATCH – PAGER
- ALL REPLACED BY A SMART PHONE THAT FITS IN YOUR POCKET

ELECTRONICS ARE EVOLVING – GETTER SMALLER & MORE SOPHISTICATED (iAIR)

- TOTAL PC SHIPMENTS HAVE DECLINED LAST SEVEN QUARTERS:

EPA DID NOT COVER ELECTRONICS SEPARATELY IN ITS WASTE DATA UNTIL THE LATE 90'S

THE EVOLVING TON: THINGS CHANGE, DON'T THEY?

LOOKING AT THE EVOLVING TON, WHO PREDICTED LESS PAPER, MORE PLASTICS & OR THE iPhone IN THEIR SOLID WASTE MANAGEMENT PLANS?

- OR THE IMPACT OF THESE CHANGES ON THE REVENUES OF MRFS?

HOW MANY PLANS & STUDIES HAVE BEEN BASED ON THE IDEA THAT THE WASTE STREAM WILL REMAIN UNCHANGED FOR 20 OR 30 YEARS?

SEGUE: HOW DO WE MANAGE THIS EVOLVING WASTE STREAM?

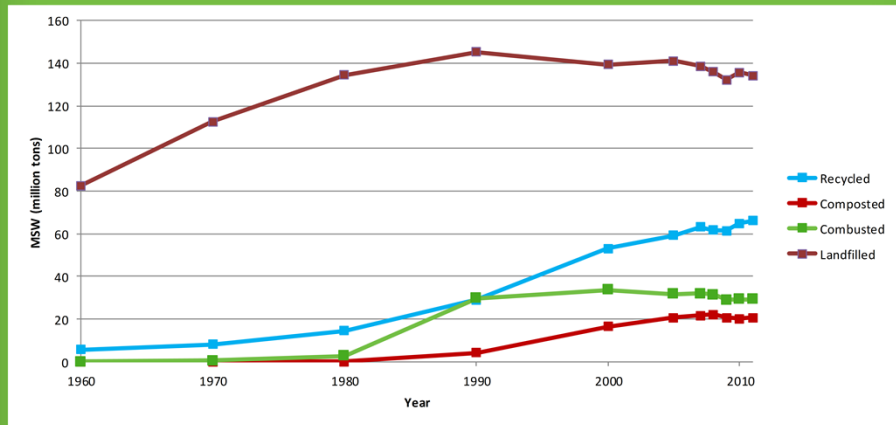
MANAGEMENT TRENDS



- Less disposal
- More recycling
- More composting
- More AD?

THESE TRENDS WILL ONLY INCREASE

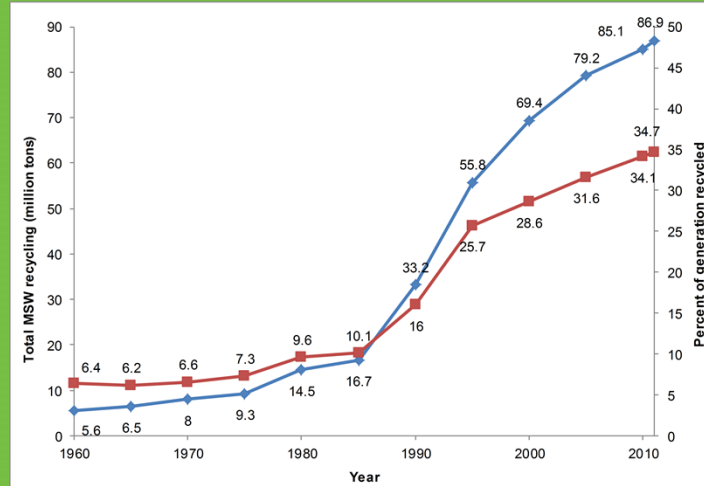
MANAGEMENT TRENDS



1960 – 2011

EPA DATA

RECOVERY RATES



EPA DATA 1960 - 2011

NOTE THE JUMP IN THE 90'S:

- GARBAGE BARGE IN 1987 LEAD TO RECYCLING LEGISLATION FROM 88 – 90

INCREASE SLOWING DOWN: CAN'T GO STRAIGHT UP FOREVER,
NONETHELESS, 25 % INCREASE IN TONNAGE SINCE 2000

MORE THAN 9000 COMMUNITIES HAVE CURBSIDE COLLECTION PROGRAMS FOR RECYCLING

- CURBSIDE PROGRAMS FOR APPROXIMATELY 70 PERCENT OF U.S. POPULATION.
- LEAST SERVED AREAS ARE RURAL
- AREAS FOR IMPROVEMENT: MF – COMMERCIAL ESP SMALL BUSINESSES & PUBLIC SPACE

RECYCLING: 2000 – 2011



- Packaging recycling now 38,300,000 tons
- Up 9,430,000 tons (32.6%)
- Packaging recycling rate now 51%

NOTE: THESE INCREASES OCCURRED EVEN THOUGH PACKAGING GENERATION WAS VIRTUALLY THE SAME IN 2000 AS IN 2011

RECYCLING: 2000 - 2011



- Printed paper recycling tonnage now 17,240,000
- Up 720,000 tons
- Printed paper recycling rate now 74%
- Up from 42%

NOTE: INCLUDES NEWSPAPER AS PRINTED PAPER

MODEST INCREASE IN RECYCLING TONNAGE

ROBUST INCREASE IN RECYCLING RATE

THIS OCCURRED EVEN THOUGH GENERATION WAS DOWN BY 16 MILLION TONS (41%)

- CURBSIDE PROGRAMS STARTED COLLECTING MIXED PAPER

RECYCLING: 2000 - 2011



- Metals: flat
- Glass: up
- Plastic: up
- Textiles: flat
- Wood: up

TREND IS CLEAR: MORE RECYCLING & SEGUE TO OTHER ORGANICS

METALS:

- *STEEL CANS UP (70%)*
- *ALUMINUM CANS FLAT (55%)*

GLASS: UP BUT STILL LOW (34%)

PLASTIC: UP BUT STILL LOW:

- *PET: 29%*
- *HDPE: 28%*
- *OTHER CONTAINERS: 15%*
- *ALL PLASTIC PACKAGES: 13%*

TEXTILES: 15%

WOOD: 15% FROM 10%

ORGANICS



- Composting tonnage up 4,250,000 tons
- Composting rate up 26%
- Feeding America
- Anaerobic digestion limited

ALMOST ALL EPA COMPOSTING TONNAGE IS YARD WASTE

- FOOD WASTE RESIDENTIAL 100+ COLLECTIONS AT THE CURBSIDE: LEFT COAST, MINNESOTA
- COMMERCIAL INCREASINGLY PROMINENT

FEEDING AMERICA:

- 2,000,000 MILLION TONS IN 2013
- 530,000 TONS DIVERTED BY RETAILERS FROM DISPOSAL TO FEEDING THE HUNGRY
- CHANGE IN CALORIC CONTENT FROM BAKERY STARCHES TO DAIRY, PRODUCE & MEAT

ANIMAL FEED:

- 15 MT MFR (FWRA STUDY) + 5 MT LAND APP
- 2.7 MILLION TONS SPENT BREWERS GRAINS (FDA RESTRICTIONS?)

ANAEROBIC DIGESTION LIMITED

- DAIRY MANURE AD LEADING MARKET FOR COMMERCIAL FOOD WASTE IN IN, MI & PA
- 10% ADDITION FOOD WASTE = DOUBLE ENERGY PRODUCTOIN
- DIGESTATE AS ANIMAL BEDDING
- NY STATE GRANT PROGRAM
- COST & INFRASTRUCTURE & HOW GET TO THE FACILITIES (NOT

PACKERS)

SEGUE TO SOURCE REDUCTION

SOURCE REDUCTION



EPA 1996: 23.2 million tons less:

- Avoiding the curb
- Lightweighting
- Reuse

HOW DOES SOURCE REDUCTION FIT IN?

1999 EPA REPORT: NATIONAL SOURCE REDUCTION CHARACTERIZATION REPORT FOR MSW IN THE US

- ESTIMATED IMPACT OF SOURCE REDUCTION ON THE AMOUNT OF MSW GENERATED IN 1996
- LOOKED AT BOTH PRODUCTS THAT HAD SOURCE REDUCED & THOSE THAT “EXPANDED”
- ONE OF EPA’S NEATEST & LEAST KNOWN REPORTS

KEYS WERE LIGHTWEIGHTING, REUSE & AVOIDING THE CURB

SEGUE: YARD WASTE SAW THE BIGGEST REDUCTION BY SIMPLY “AVOIDING THE CURB” THROUGH BACKYARD COMPOSTING & GRASSCYCLING

NOTE: EPA ALSO ESTIMATED “SOURCE EXPANSION “B: INCREASES IN GENERATION AS A RESULT OF CONSUMER SPENDING

- *MOSTLY MORE CORRUGATED BOXES & PRINTED PAPER*
- *SOURCE EXPANSION ADDED 6.6 MILLION TONS*
- *THAT WAS OFFSET BY 30 MILLION TONS IN SOURCE REDUCTION*

ZERO WASTE



- “Zero waste” means?
- 100+ communities
- Smart capitalism

ZERO WASTE IS ?

LOCAL GOVERNMENTS PASS RESOLUTIONS ADVOCATING ZERO WASTE

- MOSTLY INCREASED RECYCLING & CENTRALIZED COMPOSTING
- PAY AS YOU THROW (WITH INCREASED COMPOSTING & GRASSCYCLING)
- LITTLE LOCAL GOVERNMENTS CAN DO TO REDUCE CONSUMPTION

SMART CAPITALISM

- TURN A COST CENTER INTO AN ASSET/REVENUE CENTER
- MORE URGENCY AS COMPANIES LOOK FOR NEW WAYS TO GET AN EDGE ON THEIR COMPETITORS

COMPANIES



- Kroger
- Honeywell System Sensor
- MillerCoors
- General Mills
- Subaru
- General Motors
- AB InBev
- Dell
- Unilever
- Proctor & Gamble
- Ford
- Volvo
- Toyota
- Bridgestone
- Southern Tier Brewing
- Walmart
- NY State Legislature
- Kona Brewing

COMPANIES IN THE NEWS BETWEEN MID-JUNE AND LATE SEPTEMBER

WHO KNOWS HOW MANY I MISSED?

SEGUE : WHAT THEY DID

SUBSTANCE



- Increase diversion to 65% by 2013
- Defect rate down by 80%
- No waste to landfill
- Donated food waste...decreased overall generation by 40%
- Auto production plant landfill free
- Zero waste to landfill at 116 facilities, 45 in North America
- Reduce packaging use by 100,000 tons annually by 2017
- Waste-free packaging by 2020
- Reduced waste by one million household bins
- Zero waste to landfills at 45 factories
- Five year plan to reduce waste by 40% per vehicle
- Zero waste to landfill
- 95% reduction in waste to landfills all North American plants, averaged over 3 years
- Two tire manufacturing plants zero waste to landfill
- Spent brewery grains to animal feed instead of landfill
- 80 percent waste reduction, increase use of recycled plastic
- Publish bills electronically, not on paper
- 11% lighter glass beer bottles

NY STATE LEGISLATURE STATE CONSTITUTION REQUIRES BILLS BE PRINTED & ON LEGISLATORS DESKS 3 DAYS BEFORE VOTE CAN BE TAKEN

- 19 MILLION PAGES EVERY TWO YEARS. (?PAGE COUNT)
- CONSTITUTIONAL AMENDMENT PENDING TO ALLOW ELECTRONIC COPIES.

ARKANSAS ANECDOTE (CO. LF NEEDED REV CALLED STATE TO COMPLAIN)

NOTE: GM REN CENTER

- ZERO WASTE TO LANDFILL
- 51% TO WTE (WHICH CREATES ASH)
- BUT HONEST ABOUT IT

SEGUE: WHAT DOES THIS MEAN FOR THE FUTURE?

FUTURE: SOURCE REDUCTION



- Limits of lightweighting?
- New materials or products?
- Reuse?
- Do we care about reduce?

LIMITS OF LIGHTWEIGHTING?

- STILL MUST PROTECT PRODUCT AND PACKAGE INTEGRITY

INDUSTRY PROJECTIONS FOR INCREASE IN PLASTIC PACKAGING BOTH RIGID & FLEXIBLE

- NOTE PACS REPLACING BOTTLES FOR DETERGENT

IF A NEW PACKAGE CANNOT BE RECYCLED BUT HAS A LIGHTER ENVIRONMENTAL FOOTPRINT IS THAT GOOD OR IS RECYCLING ALL WE REALLY CARE ABOUT?

FUTURE: RECYCLING



- More mandatory recycling: commercial and multi-family
- More dirty MRFs?
- Less paper, more plastic at MRFs
- More C&D recycling
- On-line shopping

SAN JOSE MULTIFAMILY

MIXED WASTE PROCESSING: DIRTY MRF

LESS PAPER THEREFORE LESS \$ AT MRFS

- & PROCESSING COST OF MORE, LIGHTER DIFFERENT TYPES OF PLASTICS

ON-LINE SHOPPING: 6% OF SALES BUT

- BEGINNING OF LONG-TERM CHANGE IN SHOPPED HABITS REDUCING BRICK & MORTAR STORE TRAFFIC TO ON-LINE
- PACKAGING IMPLICATION: CORRUGATED OR FLEXIBLE OR BOTH?

CHANGES IN COMPOSITION OF RECYCLABLES & CHANGES IN REVENUE MIX ALONG WITH INCREASED VOLATILITY IN COMMODITY PRICES STRESS MRF ECONOMICS

FUTURE: ORGANICS



- More food waste diversion
- More composting
- Anaerobic digestion?
- Landfill gas?

MOVE CAREFULLY & AVOID MISTAKES WE MADE WHEN RECYCLING EXPANDED

- VT, MA, CT FORCED USE OF AD/COMPOSTING IF AVAILABLE
- NEED COMPETITION NOT FORCED USE
- “WE’RE THE PHONE COMPANY. WE DON’T CARE, WE DON’T HAVE TO”

IMPACT OF FOOD WASTE BANS FROM LANDFILLS

FUTURE: OVERALL



- Less waste
- Less disposal
- Evolving material mix
- Continued zero waste by industry

IF ECONOMY TAKES OFF, WILL WASTE GENERATION FOLLOW?

DISPOSAL NEEDED FOR A LONG TIME

- FLAT, NOT IN FREE FALL

EXCITING TIMES!

THE FUTURE AIN'T WHAT IT USED TO BE!



FOR MORE INFORMATION:

Chaz Miller

202-364-3742

www.environmentalistseveryday.org

cmiller@wasterecycling.org