

# Consumption, Climate, Zero Waste and the Green New Deal

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# Abstract

Solutions to climate change are usually limited to alternative energy, alternative transportation, energy conservation, and related topics. This is based on contribution of carbon to the atmosphere by electrical generation, buildings, and transportation sectors. But in 2009 USEPA presented a paper at a zero waste conference in Devens, MA, showing an alternative view of carbon emissions to the atmosphere. In this systems view, EPA showed that materials management, specifically, production, transportation and use of consumer goods, packaging and food accounted for about half of carbon emissions to the atmosphere. Looked at this way, it becomes clear to professionals in the fields of waste prevention, reuse, recycling and composting, that these methods, aka Zero Waste solutions, together are a long-neglected but productive way to combat climate change. And yet, this information, this EPA pie chart, is not known by those who have been devising Green New Deals or other programs to combat climate change. The purpose of this paper is to draw the connections between consumption, climate change, zero waste and the Green New Deals that are being discussed across the US so that those who are developing and voting on them will be doing so with this critical information about carbon sources and solutions.

# Questions to answer

**Which activities contribute the most carbon to the atmosphere?**

**What is the relationship of goods, packaging and food consumption to climate change?**

**How much do zero waste strategies reduce GHG emissions?**

**Can Municipal Climate Impact Plans include Zero Waste elements to reduce GHG emissions?**

**Can Zero Waste Solutions Generate More Jobs?**

**Does the Green New Deal have any Zero Waste Provisions?**

# A Word on Climate ...

- 350 ppm ambient CO<sub>2</sub> had been the agreed upon limit that we couldn't exceed or we couldn't go back. (It was 280 before the industrial revolution)
- We passed 415 ppm in spring 2019 due to increased carbon emissions
- Between 2030 and 2045, NYC will have 500 year floods every 5 years

**This is what that  
looks like →**

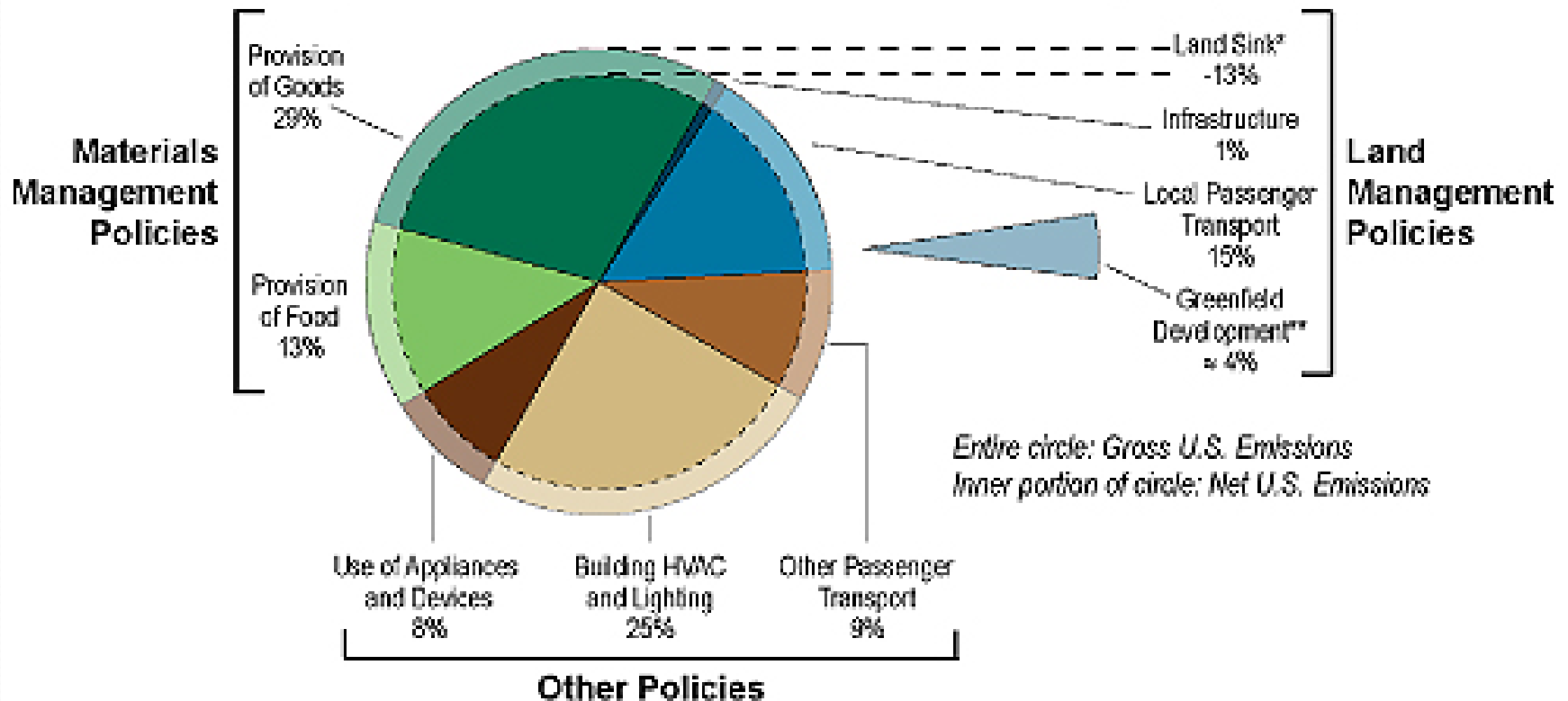
**Then there's the  
1,000 year floods...**



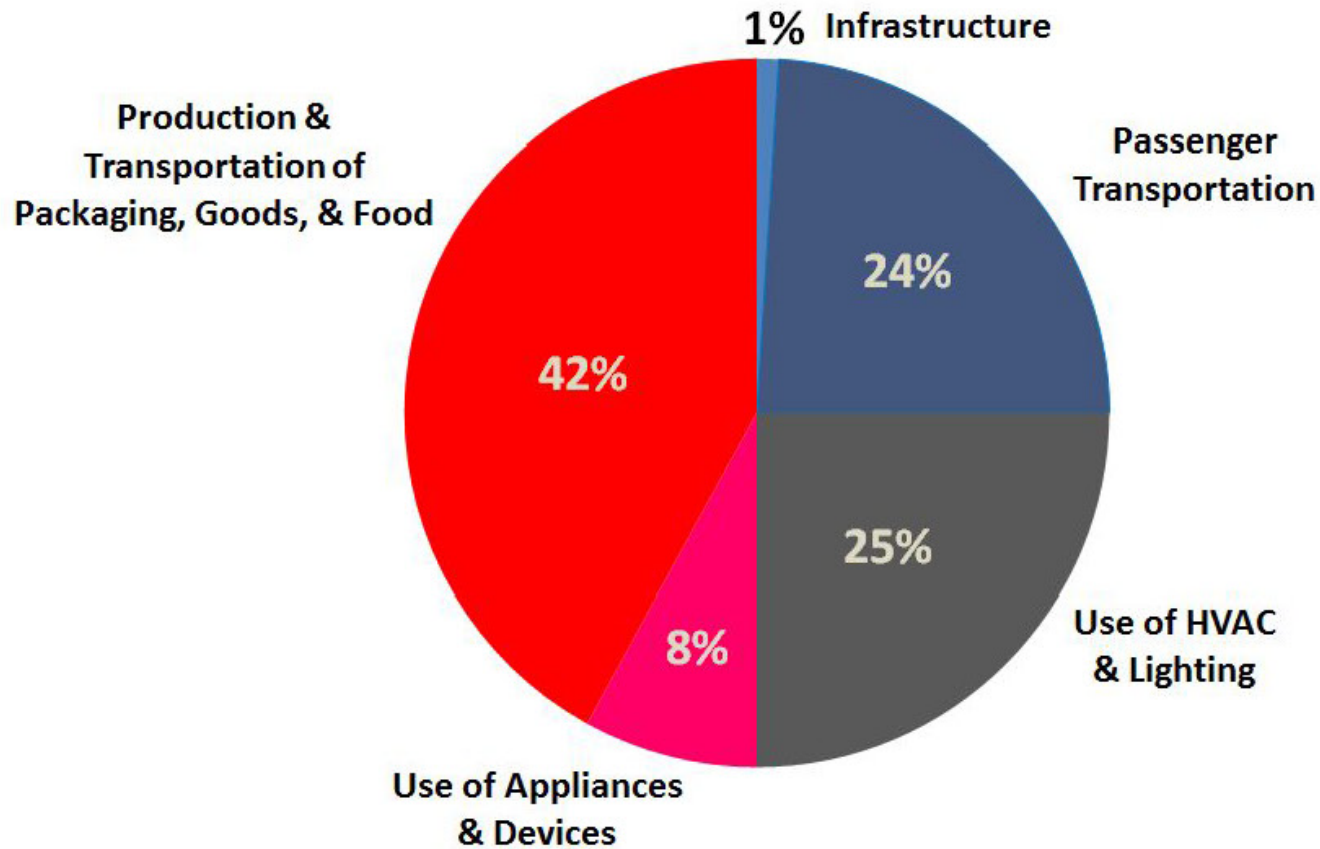
# Source of Carbon Contributions to the Atmosphere

The 2006 report from the USEPA suggests that way Americans procure, produce, transport, use and dispose of goods and services — what the agency refers to as “**materials and land management**” — **accounts for 50% of the nation’s greenhouse gas emissions.**

Figure ES-1  
Systems-Based View of U.S. GHG Emissions (2006)



## The Most Important Graph Re-Expressed Systems-Based View of Greenhouse Gas Emissions (EPA, 2006)



Opportunities to Reduce Greenhouse Gas Emissions through Materials & Land Management Practices, U.S. Environmental Protection Agency Office of Solid Waste & Emergency Response, September, 2009

Re-expressed by Maggie Clarke, Ph.D., 2019

## *Reducing Consumption is key to reducing carbon emissions*

- *“For every pound a consumer throws away, there’s 70 pounds of upstream waste. We’ve got to reduce consumption and produce our products better”<sup>1</sup>*
- **Upstream: mining, logging, refining, manufacturing, and transportation inbetween.**
- *Waste Prevention and Reuse are far more effective at reducing climate impacts than Recycling and Composting.*

<sup>1</sup> “The Next Efficiency Revolution: Creating a Sustainable Materials Economy” , John Young and Aaron Sachs, Worldwatch Institute, 1994, p. 13.

# Materials Production Is a Significant Part of the Carbon Footprint

EPA recognized as far back as 1990 that the largest impact of waste is in materials production as compared with downstream (recycling and disposal) in the life-cycle of waste. EPA realized that reducing the demand for consumer goods, packaging and food would reduce emissions generated in the extraction of materials (e.g., logging and mining), refining and manufacturing processes, and transportation of materials between these steps.

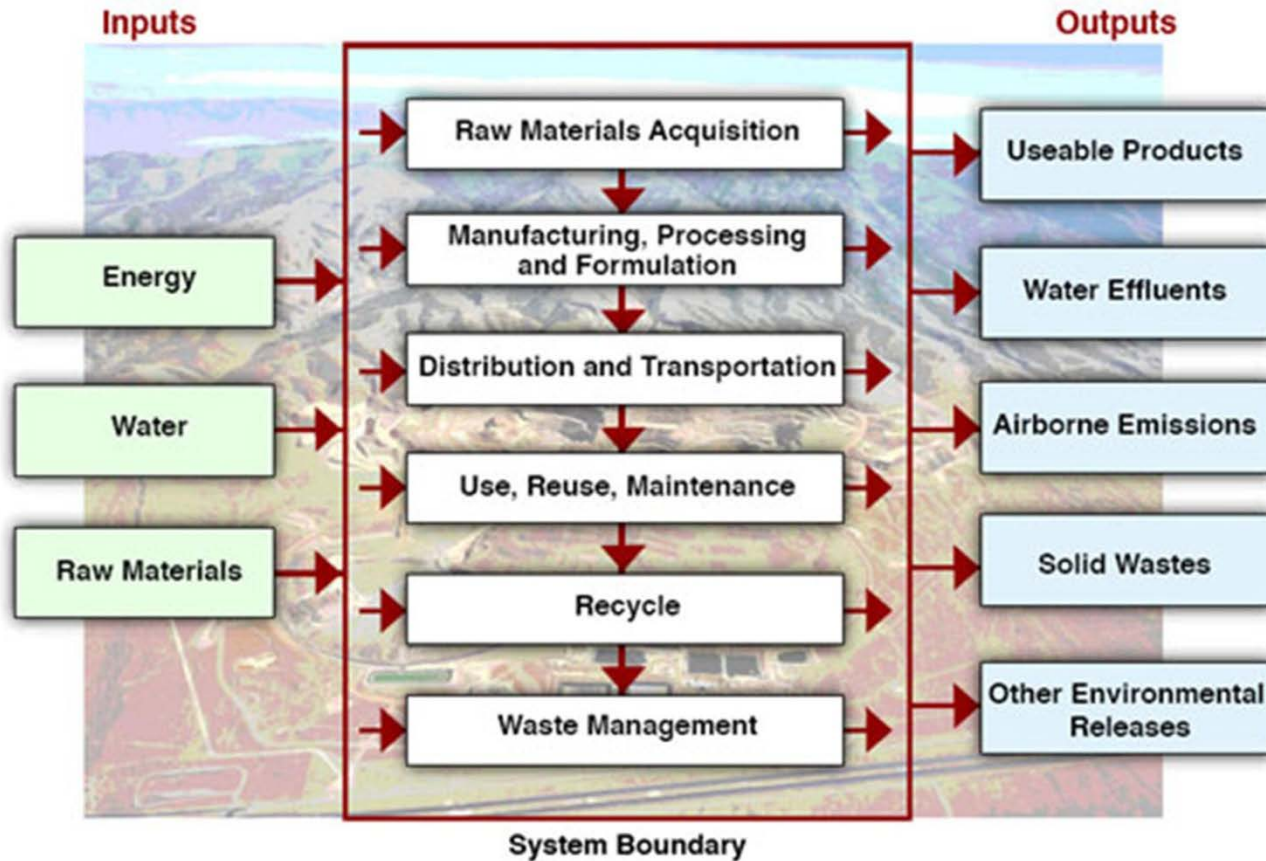
Reducing the use of paper and wood products allows the trees to remain as carbon sinks in the forests.

Reducing landfilling and incineration by using zero waste methods like recycling reduces carbon emissions to the atmosphere.



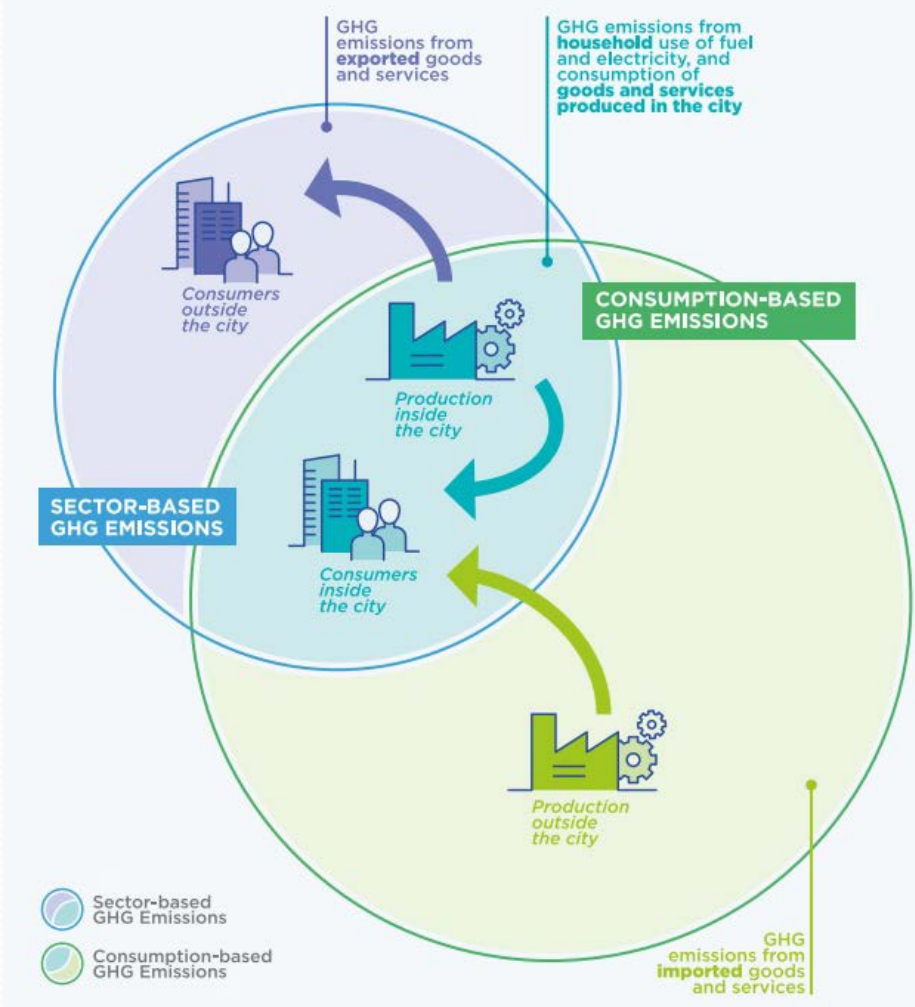
# Why Reducing Consumption is So Important

## Life cycle Assessment (LCA) Overview



Sustainable Facilities Tool, General Services Administration. <https://sftool.gov/plan/400/life-cycle-assessment-lca-overview>

# Consumption-based GHG emissions accounting properly assessing emissions to those who *demand* products, packaging and food



Source: Consumption based GHG emissions of C40 Cities Climate Leadership Group, Leeds, UK March 2018

# Climate Action Plans

**As far back as 2004, cities like San Francisco have included zero waste programs as part of their citywide Climate Action Plans, which also include alternative energy projects like wind energy and solar energy, and energy conservation. There are many municipal zero waste plans including zero waste.**

**EPA advises state & local jurisdictions on writing Climate Action Plans & has plan listing on website: “A climate change action plan lays out a strategy, including specific policy recommendations, that a local government will use to address climate change & reduce its greenhouse gas emissions”**

# San Francisco's 2004 Plan included Zero Waste

- EPA advises state and local jurisdictions on writing Climate Action Plans and has a listing of plans on its website:
- “A climate change action plan lays out a strategy, including specific policy recommendations, that a local government will use to address climate change and reduce its greenhouse gas (GHG) emissions” San Francisco’s 2004 Climate Action Plan includes sections detailing zero waste measures accomplished and planned.
- These represent 302,000 tons of CO<sub>2</sub> reduced from a total of 2,614,000 for all categories of actions (also including transportation, energy efficiency, and

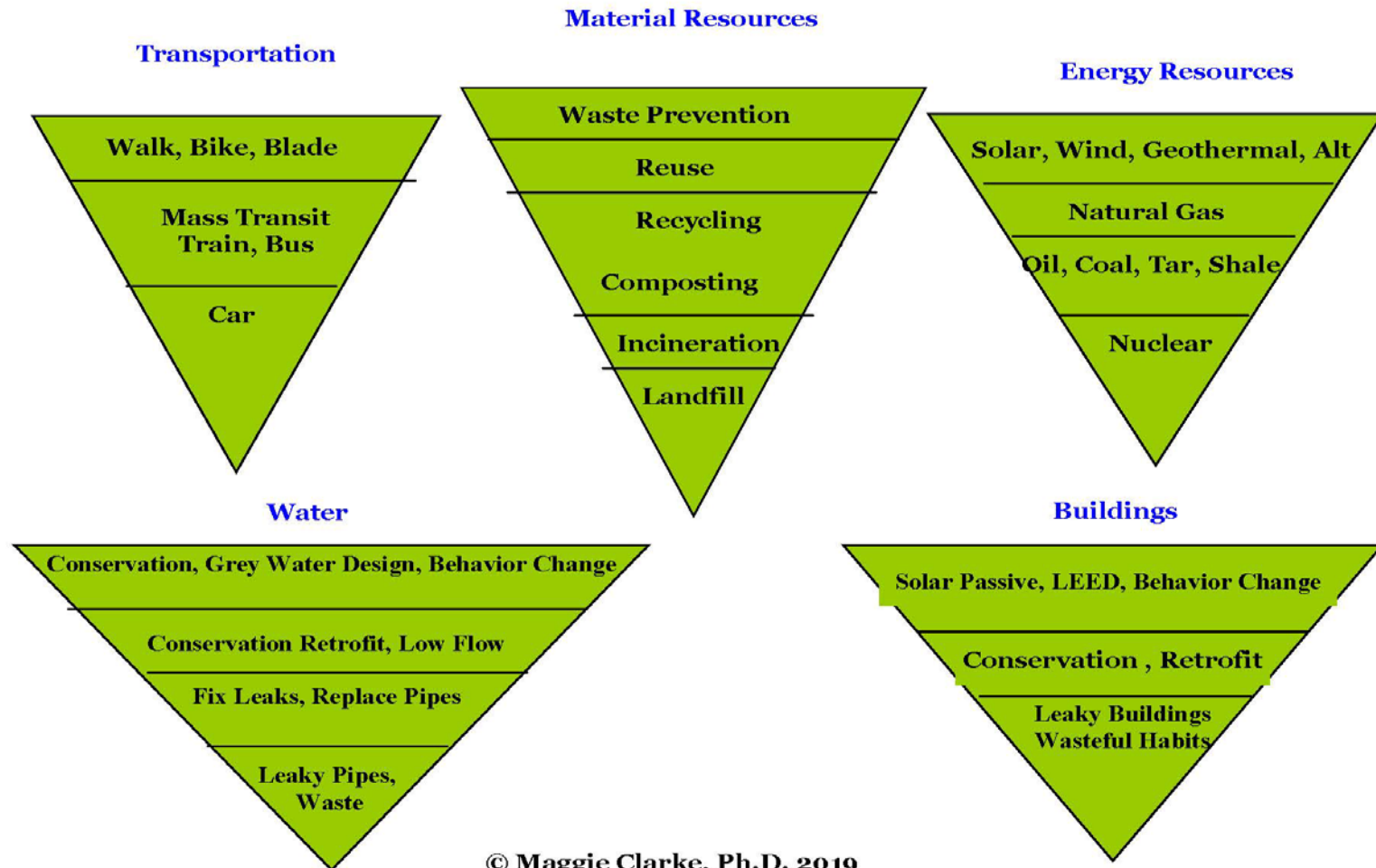
Solid Waste Action Categories	Estimated CO <sub>2</sub> Reduction (tons)
A. Increase Residential Recycling and Composting	70,000
B. Increase Commercial Recycling and Composting	109,000
C. Expand Construction and Demolition Debris Recycling	57,000
D. Support Alternate Collection Methods for Recyclable Materials	66,000
E. Promote Source Reduction, Reuse and Other Waste Reduction <sup>95</sup>	–
F. Expand Municipal Programs <sup>96</sup>	–
<b>Total</b>	<b>302,000</b>

# Green New Deal

- **House Resolution 109**
- **Says the US creates 20% of GHG –ignoring that our consumer demand has us offshoring even more**
- **Correct injustices, like original New Deal –**  
*Creates jobs, vulnerable, color, migrant, rural, low-income, disabilities, youth, etc*
- **New jobs in large-scale investments: zero-emission technologies, sustainable infrastructure, new energy grid, high speed rail, clean manufacturing, eliminate pollution and GHG in agriculture**

# Zero Waste in the Context of Sustainability

All Sectors have hierarchies, lowest impact, most jobs on top



# Job benefits of Zero Waste

The Green New Deal legislation also refers back to the original New Deal, which prioritized job creation.

More jobs are created at the top of sustainability hierarchies than at the bottom.

Repair and reuse of products creates orders of magnitude more local jobs than landfilling and incineration do on a per ton basis.

**Table 7: Job creation in the U.S.  
from reuse and recycling versus disposal**

Type of Operation	Jobs per 10,000 TPY
<b>Product Reuse</b>	
Computer Reuse	233
Textile Reclamation	93
Misc. Durables Reuse	69
Wooden Pallet Repair	31
<b>Recycling-based Manufacturers</b>	
Paper Mills	19
Glass Product Manufacturers	29
Plastic Product Manufacturers	102
<b>Conventional Materials Recovery Facilities</b>	<b>11</b>
Composting	4
Landfill and Incineration	1

TPY = tonnes per year

Note: Figures are based on interviews with selected facilities around the U.S.  
Source: Brenda Platt and Neil Seldman, *Wasting and Recycling in the United States 2000* (GrassRoots Recycling Network, Athens, Georgia, U.S.: 2000), p. 27.

# Flaws in Green New Deal:

- Nuclear power is not off the table!!!
- No specific recommendations like cap and trade or carbon taxes
- the most glaring omission in the GND is its **lack of any climate solutions employing ZERO WASTE strategies!**

**Successfully challenging mindless, unfettered, virgin-material consumerism and economic growth that has adverse environmental externalities are the final third rail we have to conquer in order for the environmental movement to mature**



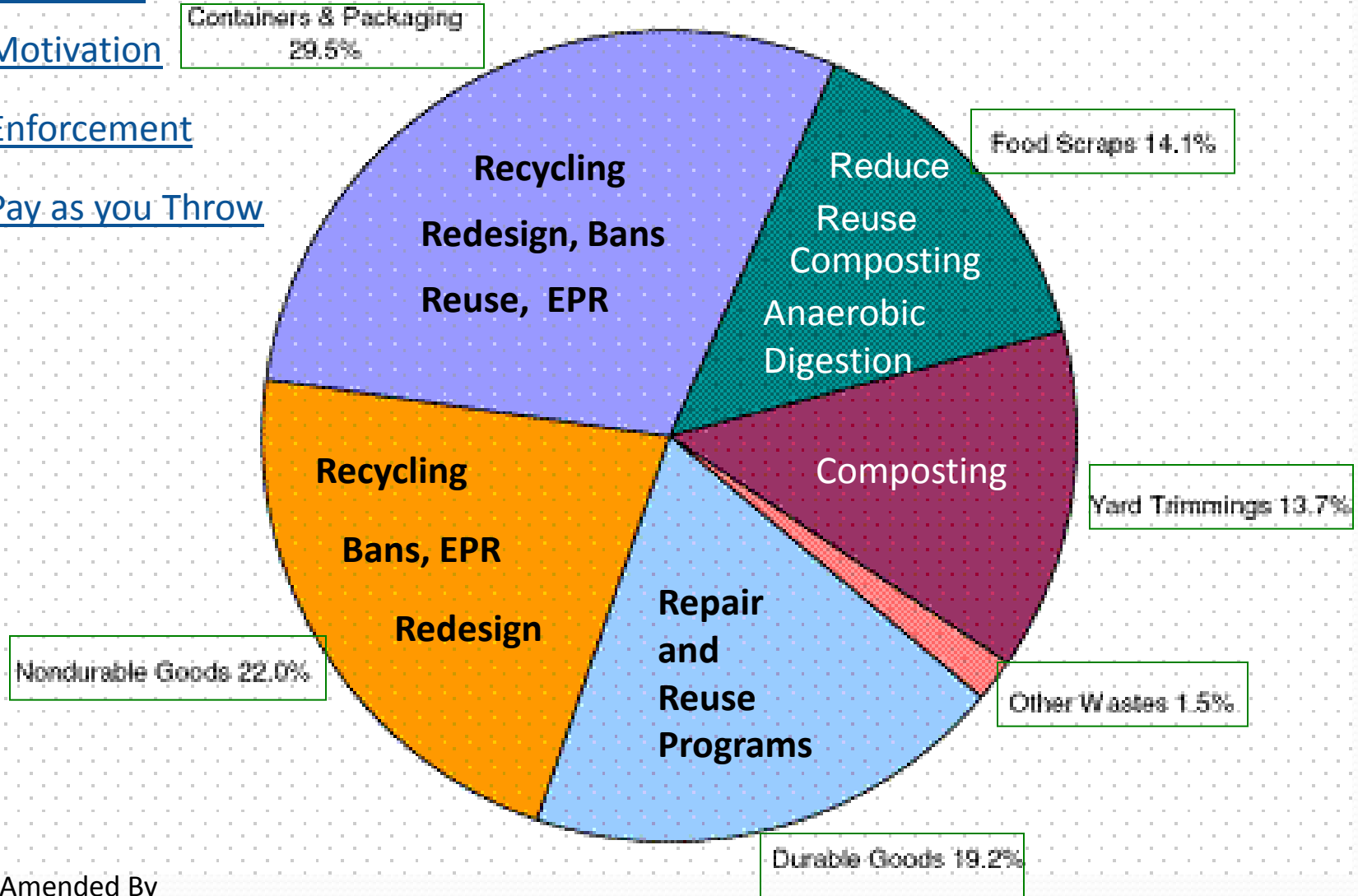
# Zero Waste Solutions

Education

Motivation

Enforcement

Pay as you Throw



Amended By  
Maggie Clarke, Ph.D.

Source: Municipal Solid Waste in the United States, 2009 Facts and Figures, USEPA Office of Solid Waste, EPA530-R-10-012, December 2010

# Conclusions & Recommendations

- **Since sustainable materials management addresses 42% of the carbon emissions problem, zero waste solutions and the circular economy should become high priority solutions for any Green New Deal legislation, program budgets and statewide plans with the purpose of reducing climate change.**
- **State and local budgets for zero waste solutions are typically starved while disposal budgets dominate.**
- **Serious reductions to climate change would occur if zero waste programs, legislation, billing systems like Pay as you throw, improved education and enforcement were to be adequately funded and prioritized in the state.**
- **Much of the materials disposed in incinerators and landfills can be prevented, reused, recycled or composted with proper programs and legislative support.**
- **The best solution is a plan for 2030 with milestones laid out in each year addressing all slices of the pie with programs and legislation, fully paid for, and which add up to 90% reduction/diversion.**

# **The Green New Deal Must Have Zero Waste Initiatives!**

## **Call to Action:**

- 1. Environmental groups should be aware and spread the word: Outreach: website, social**
- 2. Legislators should understand the link between carbon emissions and zero waste solutions**
- 3. Legislators must be encouraged to include Zero Waste initiatives in the Green New Deals on federal, state and local levels.**



# Consumer Demand and Climate Change

## Rethinking Consumer Demand For a Zero Waste World

**Consumer demand drives greenhouse gas (GHG) emissions to our atmosphere.**

The accumulation of greenhouse gas emissions in our atmosphere causes global temperatures to rise.

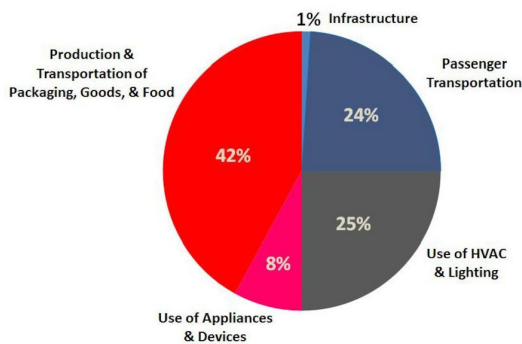
Even small increases in global temperatures cause sea levels to rise, crops to fail and excessive rain or drought.

By 2030, these climate changes will cause Manhattan and other parts of NYC to flood every five years rather than every 500 years.



*Manhattan Flooded by Rising Sea Levels*

### System-Based View of Greenhouse Gas Emissions<sup>1</sup>



"For every pound a consumer throws away, there's 70 pounds of upstream waste. We've got to reduce consumption and produce our products better."<sup>2</sup> Upstream is defined as the mining, logging, refining, manufacturing and transportation that occurs between these steps before consumption.

**How consumer demand adds greenhouse gas emissions to our atmosphere:**

The pie chart on the left is important because it shows that the production, transportation and use of consumer goods, packaging and food are responsible for approximately 50% of all global greenhouse gas emissions to our atmosphere.

This 50% of the carbon sources to the atmosphere can be reduced by programs, legislation and incentives that reduce generation of goods, packaging and food and increase reuse, recycling and composting rates. These are known collectively as zero waste systems.

<sup>1</sup>Opportunities to Reduce Greenhouse Gas Emissions through Materials & Land Management Practices, U.S. Environmental Protection Agency Office of Solid Waste & Emergency Response, September, 2009 as Re-expressed by Maggie Clarke, PhD, 2019

<sup>2</sup>The Next Efficiency Revolution: Creating a Sustainable Materials Economy by John Young and Aron Sachs, Worldwatch Institute(1994). p. 13.

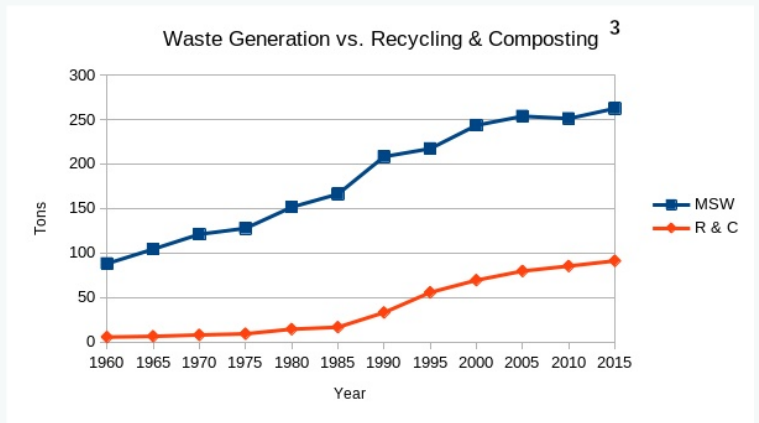
**Municipal solid waste generation has tripled in the US since 1960.**

Recycling and composting, which started to increase in 1990, has started to level off.

The line graph on the right shows clearly how recycling and composting efforts in the United States are not keeping up with municipal solid waste generation.

Of the 250 million tons of municipal solid waste generated in the year 2015 only 40%, 100 million tons, was recycled or composted. The remaining 60% was landfilled or incinerated.

We need to decrease the consumer demand for goods, packaging and food, in addition to increasing our reuse, repair, recycling and composting efforts.



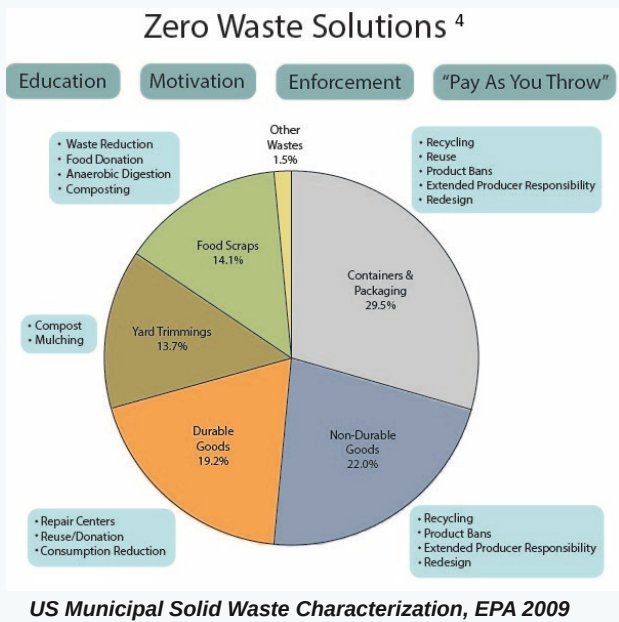
*Recycling and composting efforts are not closing the gap with solid waste generation*

**The best path to Zero Waste requires reducing consumer demand combined with increasing reuse, repair, recycling, and composting**

The graph to the left illustrates some of the most important programs that will reduce consumption and increase recycling and composting.

Consider, for example, the 29.5% of the total waste generated by the consumption of containers and packaging. Traditional recycling and reuse combined with product bans, extended producer responsibility and packaging redesign can reduce carbon emissions. Thus, policy measures are combined to reduce pre-consumer and post-consumer waste and curb emissions.

Any Green New Deal or climate change mitigation legislation must include funding for Zero Waste programs that reduce the totality of carbon impacts from consumer demand for products, food and the associated packaging, because half of carbon emissions can be reduced by Zero Waste solutions.



<sup>3</sup>Advancing Sustainable Materials Management 2016 & 2017 Tables and Figures. U.S. Environmental Protection Agency Office of Solid Waste Nov. 2019

<sup>4</sup> Municipal Solid Waste in the United States, 2009 Facts and Figures. U.S Environmental Protection Agency Office of Solid Waste. Dec. 2010 Re-expressed by Maggie Clarke, PhD and Denville Cooper, 2019



# What is Zero Waste?

## Zero Waste means

- The conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, materials, packaging, and food
- That no materials go to landfill or incinerator
- That no materials are discharged to land, water, or air, threatening environmental or human health

(Definition from Zero Waste International Alliance)



## How to Achieve Zero Waste

### To achieve zero waste (or get darn close) there must be

- An Integrated sustainable **System** of programs, legislation, plans, innovation, and incentives
- An absence of contractual obligations to landfill and/or incinerate
- **Technology** to efficiently collect, sort, process and market all discarded material
- **Create** and support **markets** for recycled materials and repaired products
- **Political will** to stop long term disposal contracts and commit to waste prevention & diversion
- Zero Waste **Planning** including immediate and long term mandates to achieve zero waste
- Each year should have **Commitments** to programs and a budget to implement them
- As close to 100% **Public Participation** in the programs as possible

## A Zero Waste System requires

### Waste Prevention

- **Reduction of consumer demand.** Want less, use less
- **Product and packaging design** for reduction, reuse, repairability, recyclability, durability, reduced toxicity
- **Extended producer responsibility.** Incorporates the environmental impact costs of a product's entire life cycle into the market price
- **Circular economy business model** is an economic system that fully utilizes discards by circulating them in a sustainable manner.
- **Pay as You Throw** charges users for waste disposal while **recycling is free or low-cost**

### Reuse

- **Right to repair.** Accessibility of reasonably priced spare parts, and repair education
- **Secondhand economy.** Widespread opportunities for swap, borrow, rent, donate, thrift shops, repair
- **Reuse characterization studies** to show the economic potential for reuse (condition, fair market value of reusables, repairability)
- **Infrastructural Inventory.** Characterization of existing / expansion of new municipal reuse infrastructure
- **Upcycling.** Transforming unwanted products into new materials / products of better quality

### Recycling and Organics

- **Targeting 100%** of recyclables and organics
- **Mandatory, curbside** pickup of recyclables and organics (food and yard)
- **Efficient routing** for collection and export
- **Effective Diversion.** Discards must be reused, recycled, composted and/or anaerobically digested and delivered to processing facilities
- **Waste characterization studies** should include information about recycling and organics collection. Studies should analyze the **distribution, market value, recyclability, compostability and/or anaerobic digestibility** of every part of the discard stream

# Technology

**Material Recovery Facilities** (Sorting of Recyclables)  
**Composting** (Utilizes oxygen to decompose organic material)  
**Anaerobic Digestion** (Does not utilize oxygen to decompose organic material)

**Product Repair Facilities**  
**Dual Bin, Fuel Efficient Trucks**  
**Product Evaluations & Certification**

# Participation

**Waste is not waste but a valuable resource.** This mindset change requires **100% consumer participation.** The City must commit to sufficiently **fund education** and **enforcement** programs that utilize a multitude of consistently applied approaches. Increasing participation means making **permanent behavior changes.**

**To reduce consumption and achieve 100% participation in sorting, reuse & recycling everyone must**

- Be **aware** of program features and incentives
- Be **understanding** of how to participate and benefits of the program
- Be **positive and open** to participating
- Intend to and be **motivated** to participate consistently

**All barriers to participating should be removed and participation should be convenient.**

# Budget and Legislation

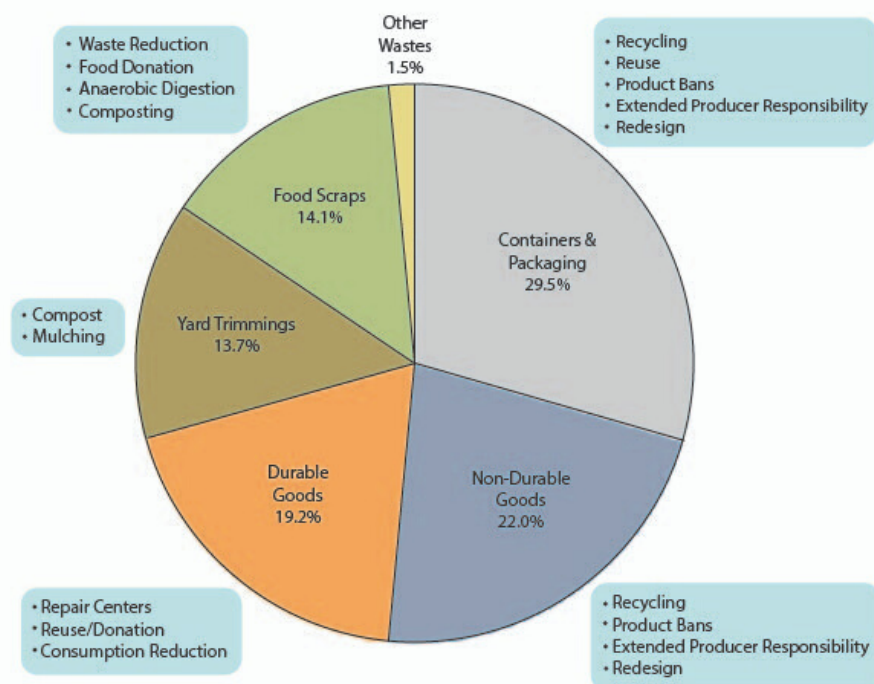
- Mandatory, curbside, universally available collection programs that transition us away from landfill and incineration
- Pilots and Research to develop, test and tweak new initiatives, adapt best practices and efficacious budgets
- Robust, continuing, multi-approach education, motivational outreach
- Sufficient capacity for product reuse infrastructure and programs (e.g. swap, rent, borrow, barter, repair, thrift) and secondary and surplus food use (e.g. food pantry donations and DonateNYC)
- Sufficient processing capacity for sorting, recycling and food scraps, and marketing
- Planning requirements, enforcement requirements, mandates for participation, PAYT, EPR

Education

Motivation

Enforcement

"Pay As You Throw"



Zero Waste Systems can **efficiently and safely manage** each material in the waste stream.

Zero Waste Systems can create more **diverse local economies** and **improve public and environmental health** by reducing air and water pollution.

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# Questions?

**For more information and copies of papers on zero waste, climate, behavior change, citizen's alternative solid waste planning and more:**

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