



# Compostable Organics out of Landfills



The logo for COOL 2012 is displayed on a blue banner. The word "COOL" is in light blue and "2012" is in orange, both in a bold, outlined font. A globe is positioned behind the text, with a target grid pattern overlaid on it.

**COOL 2012**

**Compostable Organics Out of Landfills by 2012**

**Why COOL?**

# COOL 2012

Compostable Organics Out of Landfills by 2012

How can we prevent potent landfill methane emissions  
AND build healthier soils?

► **By getting COOL.**

What's COOL?

- **Compostable Organics Out of Landfills and back to soils,  
a community level campaign to divert food waste  
and other organics to higher and better end uses.**

Help support the campaign:

Become a Partner and bring the campaign to your community.

- [www.cool2012.org](http://www.cool2012.org)



The COOL 2012 campaign was created by GrassRoots Recycling Network, BioCycle Magazine and Eco-Cycle.

## Sponsors



WhiteWave Foods, Inc.



Eco-Products



California Resource Recovery Association



Northern California Recycling Association



Richard Anthony Associates



# **Organics Recycling Industry**



**Climate Change**

**Zero Waste**

**Sustainable Agriculture**

**Jobs Economic Development**





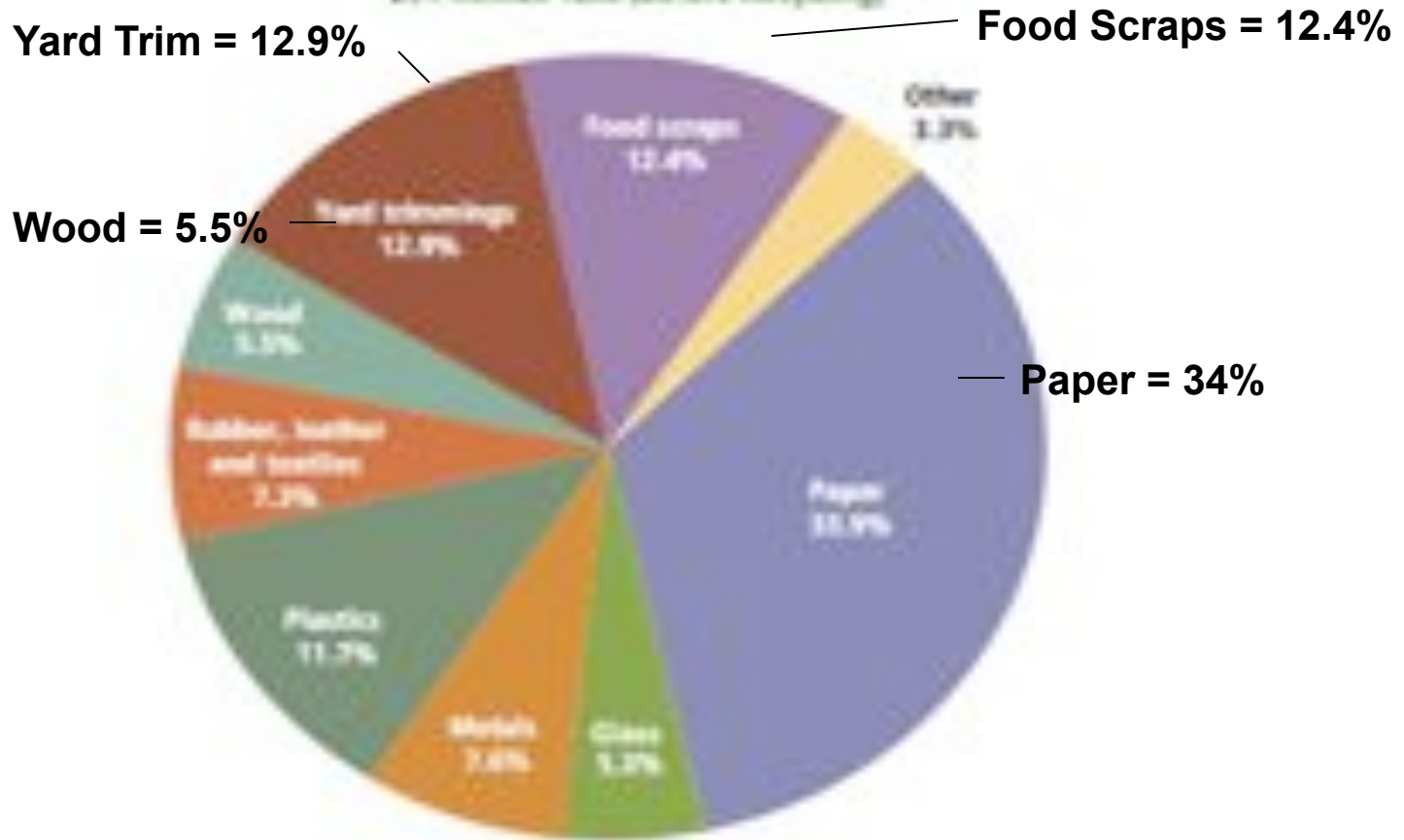
**Organics Recycling**



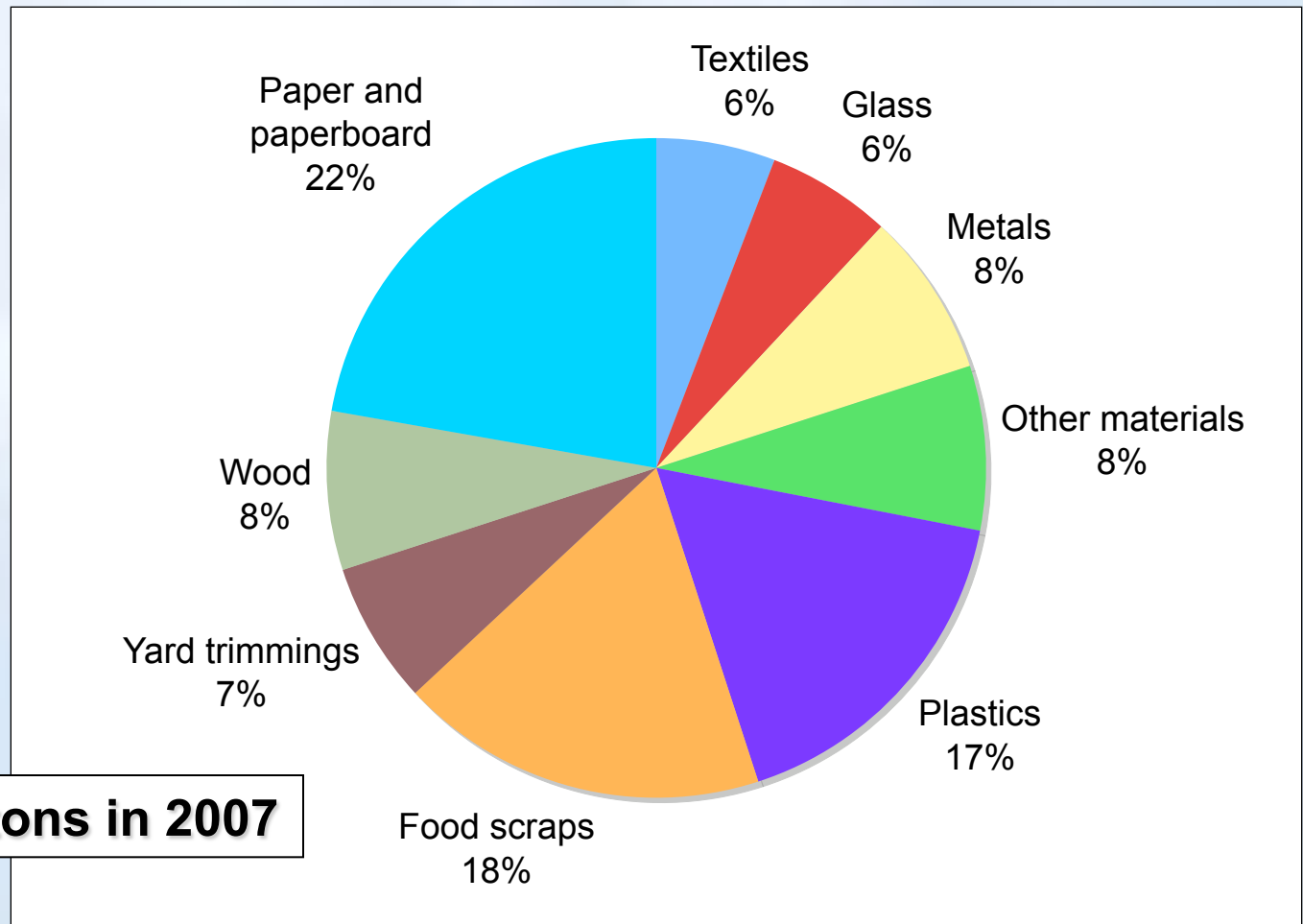
**Zero Waste**

# MSW Landscape: USEPA 2006 Waste Generation

Figure 5. Total MSW Generation (by Material), 2006  
251 Million Tons (Before Recycling)



# U.S. Municipal Waste Disposed

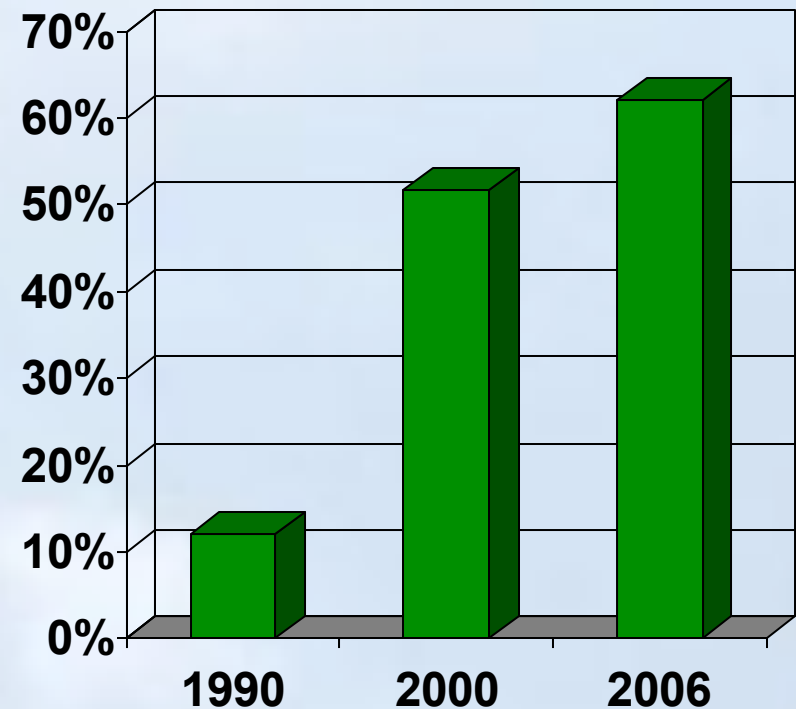


**169.2 million tons in 2007**

# Organics in the landfill: Yard trimmings

- 2<sup>nd</sup> largest category of materials generated
- Generally 50% grass, 25% brush and trees, and 25% leaves
- 62% recycled or composted
- Huge gains in recovery between 1990 and 2000 after 20+ states banned yard waste from landfills.

**U.S. recovery rate**





# Organics in the landfill: Food

- 31.3 million tons generated in the U.S. in 2006.
- 680,000 tons diverted - a 97.8% wasting rate!
- 30+ U.S. communities now offering food waste collection.



EPA food waste hierarchy

# Organics in the landfill: Paper

- **#1** in quantity generated
- **#1** in amount recycled
- **#1** material headed to landfill and incinerators
- Paper and pulp industry:
  - #1 user of industrial process water per ton of product
  - #3 industrial consumer of energy
  - #4 emitter of greenhouse gases among manufacturing industries
  - #4 in industrial sector emissions of TRI chemicals to water and 3<sup>rd</sup> in such releases to air
  - 40%+ of industrial wood harvest used to make paper

## Benefits of Recycled Paper

Compared to copy paper made from 100% virgin forest fiber, a copy paper made from 100% recycled content reduces:

- total energy consumption by 44%
- net greenhouse gas emissions by 38%
- particulate emissions by 41%
- wastewater by 50%
- solid waste by 49%
- wood use by 100%

*Source: Environmental Defense Paper Calculator*



**Why landfills?**

# Wasting = Climate Change

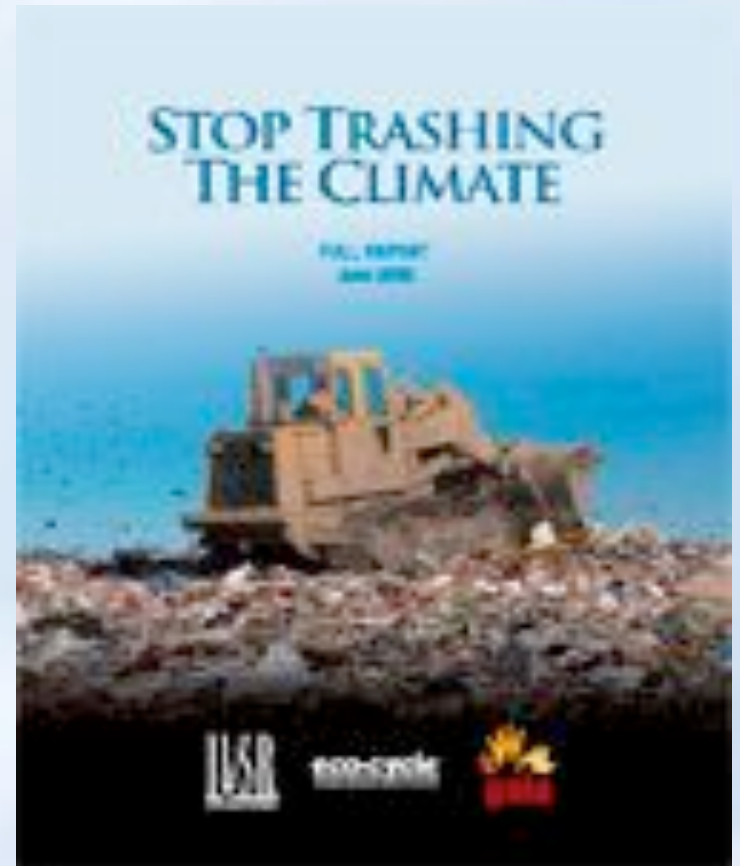




# Wasting = Climate Change

US consumes 1/3 of  
the world's timber

Deforestation = 30%  
GHG emissions





# Wasting = Climate Change

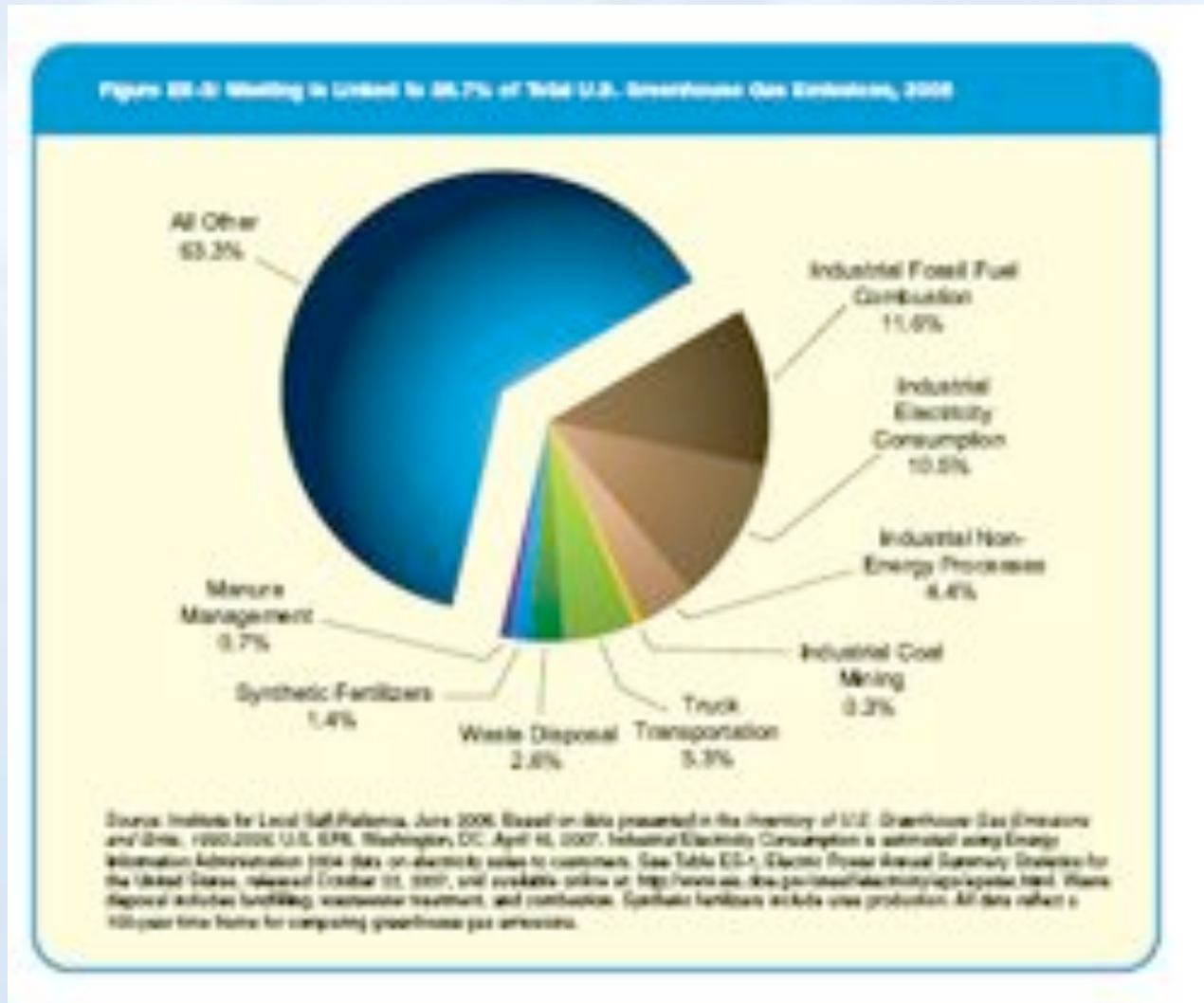
US = 5% World Population

US = 22% GHG

US = 30% World's Waste



# Wasting = 36.7% U.S. Greenhouse Gas Emissions



Source: Stop Trashing the Climate , ILSR, June, 2008

# Zero Waste = Climate Protection

**Table ES-1: Greenhouse Gas Abatement Strategies: Zero Waste Path Compared to Commonly Considered Options** (annual reductions in greenhouse gas emissions by 2030, megatons CO<sub>2</sub>-eq.)

Greenhouse Gas Abatement Strategy	Annual Abatement Potential by 2030	% of Total Abatement Needed in 2030 to Stabilize Climate by 2050 <sup>1</sup>
<b><u>ZERO WASTE PATH</u></b>		
Reducing waste through prevention, reuse, recycling and composting	406	7.0%
<b><u>ABATEMENT STRATEGIES CONSIDERED BY MCKINSEY REPORT</u></b>		
<b>Increasing fuel efficiency in cars and reducing fuel carbon intensity</b>	340	5.9%
Improved fuel efficiency and dieselization in various vehicle classes	195	3.4%
Lower carbon fuels (cellulosic biofuels)	100	1.7%
Hybridization of cars and light trucks	70	1.2%
<b>Expanding &amp; enhancing carbon sinks</b>	440	7.6%
Afforestation of pastureland and cropland	210	3.6%
Forest management	110	1.9%
Conservation tillage	80	1.4%
<b>Targeting energy-intensive portions of the industrial sector</b>	620	10.7%
Recovery and destruction of non-CO <sub>2</sub> GHGs	255	4.4%
Carbon capture and storage	95	1.6%
Landfill abatement (focused on methane capture)	65	1.1%
New processes and product innovation (includes recycling)	70	1.2%
<b>Improving energy efficiency in buildings and appliances</b>	710	12.2%
Lighting retrofits	240	4.1%
Residential lighting retrofits	130	2.2%
Commercial lighting retrofits	110	1.9%
Electronic equipment improvements	120	2.1%
<b>Reducing the carbon intensity of electric power production</b>	800	13.8%
Carbon capture and storage	290	5.0%
Wind	120	2.1%
Nuclear	70	1.2%

# Zero Waste = Climate Stabilization

- Zero Waste Path 7.0%
- Fuel Efficiency 5.9%
- Industrial Sector 10.7%
- Buildings & Appliances 12.2%
- Electric Power Production 13.8%



**Why landfills?**



# Methane = 72x carbon

## Compostable Materials= Methane



# Methane = 72x carbon

Landfill Methane = 21% of US Coal-Fired Plants



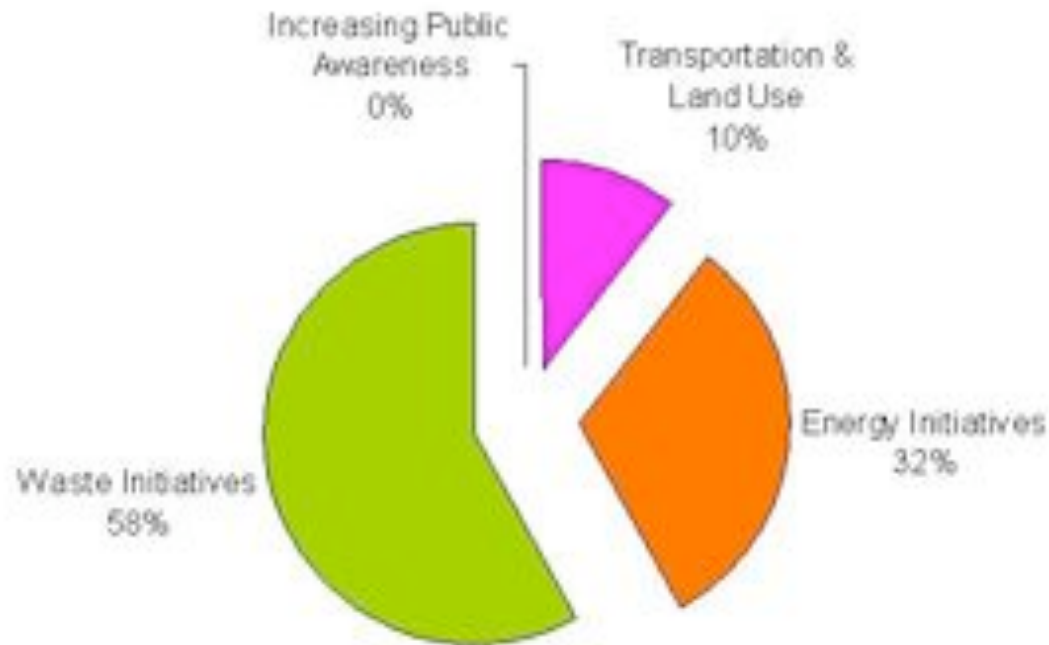
# Reducing methane is vital to avoid crossing irreversible tipping points

***[Methane] deserves special attention in efforts to stem global warming...Given the difficulty of halting near-term CO<sub>2</sub> growth, the only practical way to avoid [dangerous interference] with climate may be simultaneous efforts to reverse the growth of [methane].”***

**—James Hansen**

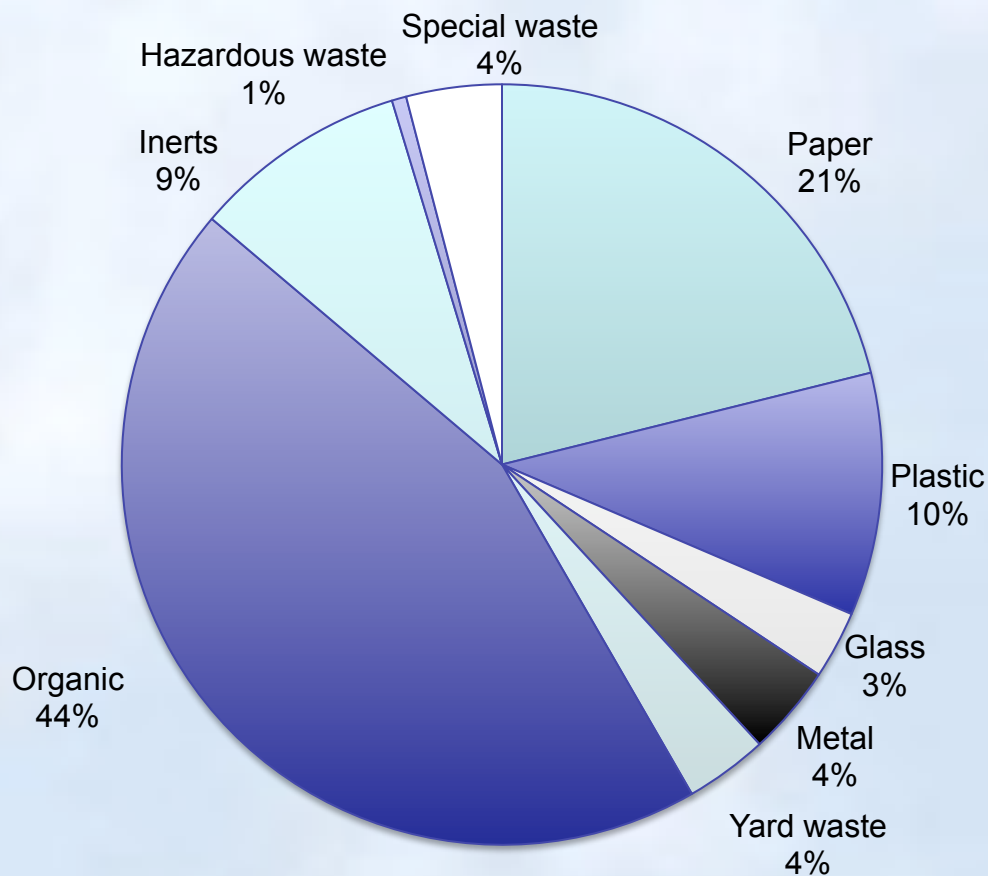
*Greenhouse gas growth rates, Nov 16 ‘06*  
Proceedings National Academy of Sciences

# City of Alameda GHG Reduction Analysis



Zero waste initiatives offer  
the most GHG reduction potential


# Alameda Citywide Waste Composition



Source: 2008 Alameda County Waste Characterization Study, [Stopwaste.org](http://Stopwaste.org)



# Alameda Firsts

- **Cart collection program 1997**
  - **Food scrap diversion 2002**
  - **Comprehensive construction and demolition recycling requirements 2002**
  - **Climate Protection Local Action Plan 2008**
  - **Ban on polystyrene to-go containers 2008**
  - 48% diversion 1995
  - 65% diversion 2000
  - 68% diversion 2005
- 

The image shows three recycling carts side-by-side. The first is a gray cart labeled 'Gray Cart Solid Waste'. The second is a blue cart labeled 'Blue Cart Recyclables'. The third is a green cart labeled 'Green Cart Organics'. Each cart has a yellow sticker on its front with additional information.





# Organics Recycling



## Sustainable Agriculture

**All that we did, all that we said or sang  
Must come from contact with the soil . . . .**

- William Butler Yeats, *The Municipal Gallery Revisited*

***“The nation that destroys  
its soil destroys itself.”***

Franklin D. Roosevelt (1882-1945)

Feb. 1937, to state governors, urging uniform soil conservation laws

# Soil Depletion

- Modern agriculture mines the soil for nutrients and **reduces soil organic matter** levels through repetitive harvesting of crops and inadequate efforts to replenish nutrients and restore soil quality.
- 30% of the worlds croplands have become degraded or unproductive in the last 40 years due to soil depletion.

# Compost Benefits

- **Suppressing plant diseases and pests**
- **Reduces or eliminates the need for chemical fertilizers**
- **Higher yields of agricultural crops**
- **Improving soil structure (tilth) which improves water holding capacity and erosion control, and improves drainage and permeability by keeping aeration channels open**
- **Buffering soil acidity**



# Compost Benefits

- Facilitating reforestation, wetlands restoration, and habitat revitalization efforts by amending contaminated, compacted, and marginal soils
- Cost-effectively remediating soils contaminated by hazardous waste
- Removing solids, oil, grease, and heavy metals from stormwater runoff
- Capturing and destroying 99.6 percent of industrial volatile organic chemicals (VOCs) in contaminated air
- Offering stronger protection against changing climate conditions (Sources: [EPA](#) and [European Commission](#) links at [cool2012.org](#))

# Fertilizers vs. Compost

- Inorganic fertilizers are energy-intensive, create waste, pollute surface water, do not restore the soil, and are a significant source of greenhouse gas emissions.
- 50% of fertilizer applied never makes it into plant tissue.

# The Soil-Climate connection

- Soils are the largest terrestrial carbon sink. Twice as much carbon in the soil as in the biomass that grows in soil.
- More carbon emitted from soils than from fossil fuel combustion from 1860s - 1970s.
- Over 20 years, most agricultural soils lose 50% of their organic carbon due to industrial agriculture's reliance on inorganic fertilizers and extensive tillage

**We're wasting the very carbon and nutrients  
our soils so desperately need to sustain our  
society.**

**Man - despite his artistic pretensions,  
his sophistication, and his many  
accomplishments - owes his existence  
to a six inch layer of topsoil and the  
fact that it rains.**

- Author Unknown

# Dual Challenges: Agriculture & Water Conservation

## San Diego County, California

- Maximizing water usage
  - Reduced supply availability
  - Rapidly escalating price
- Minimizing runoff pollution
  - Growers must be in compliance with Clean Water Act
  - Runoff testing mandate already adopted

# Maximizing Water Usage

- Mulching helps retain soil moisture
- Organic content of soil increases moisture holding capacity
- Mulching can reduce competition for water from weeds
- Organics help keep water where placed
- Aid in root development, plant efficiency
- Mulch helps protect against soil temperature rise



# Minimizing Runoff Pollution

- Irrigation and stormwater better retained when organics are present
- Organics can slow movement of pesticides and nutrients through the soil
- Mulch can reduce weed growth and need for herbicides
- Mulch can help with disease suppression, reducing need for chemical applications
- Organics aid in erosion control
- Organics reduce soil compaction, resulting in less runoff



**Organics Recycling**



**Economic Development**

# Hawaii Economic Development Board

- The Hawaii Island Economic Development Board, Inc. supports balanced, sustainable economic development in the context of broad community goals and objectives, in partnership with federal, state, county and private resources
- The Program of Work focuses on specific economic initiatives in:
  - Science & Technology
  - Diversified Agriculture
  - Tourism Product Development
  - Infrastructure
  - Communication
  - Community Social Initiatives



# FEEDING PEOPLE, ANIMALS AND SOILS ON THE ISLAND OF HAWAII

## A “COOL” Program



- Zero waste as an economic stimulus
- Adopted COOL Resolution January 2009
- Linking self reliance and resource management
- 90% used to be grown on the island, now 90% is imported
- Island of farmers and all but one (Arctic) climate

# Organics Out of the Landfill Resolution

## Compostable Organics Out of Landfills by 2012

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**WHEREAS**, landfilling biodegradable materials, such as food, paper, yard trimmings and agricultural products is greatly contributing to global warming. **WHEREAS**, these biodegradable materials, including paper products, food scraps and yard trimmings, are landfilled in the County of San Diego every day. These materials amount to approximately half of the County's discarded resources, and when buried in a landfill, decompose without oxygen and generate methane, an efficient atmospheric heat-trapping gas and a major factor in climate change. **WHEREAS**, methane is now understood to be 72 times more potent than CO<sub>2</sub> in causing climate changes over a 20-year period, the amount of time scientists have determined is left before the planet passes the "tipping point" on irreversible climate change. Landfills are the number one source of human-caused methane in the United States and emit the greenhouse gas equivalent of 20 percent of our country's coal-fired power plants every year. **WHEREAS**, landfilling any material wastes valuable natural resources. Discarded organic materials contain vast stores of macro- and micro-nutrients needed by agricultural and natural ecosystems to replenish soils. When these materials are not returned to the soil, other nutrient sources must be found. In most cases, petroleum-based and energy-intensive fertilizers are imported and substituted for natural nutrient sources. **WHEREAS**, commercial farming and shortsighted land use policies favoring energy-intensive pesticides, fertilizers and irrigation water have resulted in dramatic increases in greenhouse gases discharged into the atmosphere for more than fifty years. These practices have contributed to one-third of the increase in atmospheric CO<sub>2</sub>, while causing erosion, sedimentation, water pollution and the progressive stripping of organic matter, beneficial microbes, carbon and other essential nutrients from our soils. **WHEREAS**, healthy soils are capable of holding twice the carbon stocks of plants. Release of soilbound carbon through tilling and other shortsighted farming practices causes soils to *contribute to*, rather than protects against, global warming. These methods also compromise the ability of soil to grow food locally, nutritiously, and sustainably. **WHEREAS**, land degradation is considered a fundamental and persistent problem by the United Nations Environment Programme. **WHEREAS**, healthy soils restored with organic materials protect against flooding, erosion, and drought, promote biodiversity, filter pollutants, buffer soil acidity, and suppress plant diseases and pests while bolstering agricultural yields. **WHEREAS**, Agriculture land in San Diego County (the 5th largest industry) requires the healthier soils that can be produced through diverting organic materials from the landfill and returning the nutrients and organic matter back to farmland to grow its own. This is a critical component of re-creating a more sustainable society on our region. **WHEREAS**, the quickest and cheapest way to immediately reduce our community's greenhouse gas emissions and improve the health of soils on the island is to get compostable organics out of landfills and back into our soils through composting and anaerobic digestion technologies.

**THEREFORE**, we agree to phase these materials out of our landfills by 2012, and to redirect these materials back to our soils as useful soil amendments. Staff would establish a plan on how to best accomplish this and how to work with local agencies to encourage the use of compostable organics to sustain the health of our soils.

# **PROBLEM: Landfilling food and paper is heating the planet.**

- Biodegradable materials in a landfill decompose anaerobically, without oxygen, and produce methane.
- Landfills are #1 source of human-caused methane and a major player in climate change.
- More than half of our discarded resources are organic materials-paper products, food scraps and yard trimmings.



# GET COOL

**Local Soils:** Support local farmers and sustainable food production with community composting infrastructure.

## Compost:

- Sequesters carbon in the soil
- Suppresses diseases and pests
- Reduces or eliminates the need for chemical fertilizers
- Promotes higher yields of agricultural crops
- Improves soil structure, water holding capacity and erosion control, drainage and permeability
- Buffers soil acidity and much more!



Photo courtesy Washington State University

# GET COOL

**Stop Creating Methane Now:** There is only one proven method to truly prevent methane emissions — keep compostable organics out of landfills.

Public policy needs to first support the elimination of methane by requiring source separation of compostables and recyclables, then mitigate methane from existing sources where organics have already been buried. Landfills should not be considered sources of “renewable” energy.



Photo courtesy of Eco-Cycle

# Get COOL by 2012

- Prevent potent methane emissions
- Build healthier soils
- Replenish carbon stocks in soils
- Support sustainable agriculture
- Build local economies

Visit [www.cool2012.org](http://www.cool2012.org) for best practices, fact sheets, background materials and more.

**The technology exists, the need is certain  
and the time to act is NOW.**





# GET COOL: 4 steps

1. **Seize the Paper:** Commit to recycling a minimum of 75% of all paper and composting the rest by 2012.

The infrastructure to recycle and market the paper already exists. Global demand has never been higher. We can do better.



# GET COOL: 4 steps

**2. Source Separate:** Require source separation of residential and business waste into three streams: compostables, recyclables and residuals.

Best practice: Stockton, CA  
“recyclable material, green waste and food waste shall be separated from other solid waste for collection...”



Photo courtesy San Francisco's Fantastic Three Program



# COOL Communities

- San Diego County AB939 Citizen's Advisory Committee has passed a COOL resolution
- County of Hawaii has passed a COOL resolution
- Austin, TX
- Dubuque, IA
- Alameda County, CA
- Los Angeles ZW Plan

# COOL Communities

- Your community next?

# Methane over the short term

**Methane is now understood to be 72 times more potent than CO<sub>2</sub> over a 20-year period (IPCC).**

This means our landfills emit the greenhouse gas equivalent of 20 percent of U.S. coal-fired power plants every year!

U.S. Landfill emissions

100 year impact:

132 Tg CO<sub>2</sub> Eq.

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U. S. Landfill emissions

20-year impact:

452.6 Tg CO<sub>2</sub> Eq.

- **An agricultural adage says the tiny animals that live below the surface of a healthy pasture weigh more than the cows grazing above it. In a catalogue selling composting equipment I read that two handfuls of healthy soil contain more living organisms than there are people on the earth. What these beings are and what they can be doing is difficult to even begin to comprehend, but it helps to realize that even though they are many, they work as one.**
  - Carol Williams, *Bringing a Garden to Life*, 1998
- **All that we did, all that we said or sang  
Must come from contact with the soil . . . .**
  - William Butler Yeats, *The Municipal Gallery Revisited*
- **We could have saved the Earth but we were too damned cheap.**
  - Kurt Vonnegut, Jr.
-

- Soil is a resource, a living, breathing entity that, if treated properly, will maintain itself.  
It's our lifeline for survival. When it has finally been depleted, the human population will disappear. .... Project your imagination into the soil below you next time you go into the garden. Think with compassion of the life that exists there. Think, the drama, the sexuality, the harvesting, the work that carries on ceaselessly. Think about the meaning of being a steward for the earth.  
- Marjorie Harris, *In the Garden*, 1995

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- **To study the self is to forget the self. To forget the self is to be enlightened by the ten thousand things.**
  - **Dogen**
- **The more we understand individual things, the more we understand God.**
  - **Benedict De Spinoza, 1632 - 1677**
- **God is in the details.**

Mies Van Der Rohe
- **Details are all there are.**
  - **Maezumi**



**By the deficiency or absence of one necessary constituent, all the others being present, the soil is rendered barren for all those crops to the life of which that one constituent is indispensable.**

- Julius von Liebig, German physical soil chemist,  
Law of the Minimum, 1840

- .....the soil is the largest carbon sink on earth.
- **Nothing can be created out of nothing.**  
*"Nil posse creari De nilo."*  
- Lucretius, 99 - 55 B.C.
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