

8th Annual BioCycle Conference On Renewable Energy From Organics Recycling

October 6, 7, 8, 2008 • Madison, Wisconsin • Madison Marriott West

BIOCYCLE
CELEBRATES
50 YEARS
OF INDUSTRY
LEADERSHIP

AUGUST 2008

www.biocycle.net

BIOCYCLE

ADVANCING COMPOSTING, ORGANICS RECYCLING & RENEWABLE ENERGY

STOP TRASHING THE CLIMATE

Clay recycles
90% of his discards.

If we all did the same,
notes a newly released report
and outreach campaign,
greenhouse gas emissions
would be reduced to the
equivalent of shutting down
21% of all U.S.
coal-fired power plants.



ZERO WASTE

IT'S HIS FUTURE. IT'S OUR CHOICE.

**Renewable Fuel
Alternatives For
Heavy Equipment**

**Logistics Of
Composting Urban
Yard Trimmings**

**BioCycle Survey –
New England Food
Waste Composting**

TOWARD ZERO WASTE

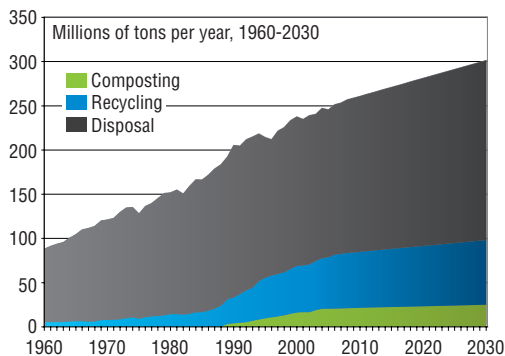
STOP TRASHING THE CLIMATE

Dramatically decreasing waste disposed in landfills and incinerators will reduce greenhouse gas emissions the equivalent to closing 21 percent of U.S. coal-fired power plants — comparable to leading climate protection proposals such as improving national vehicle fuel efficiency.

Brenda Platt and Eric Lombardi

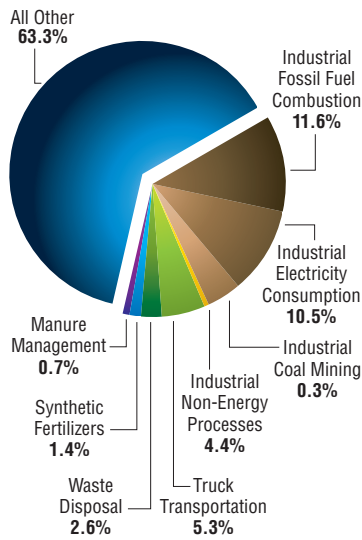
IN JUNE, the Institute for Local Self-Reliance (ILSR) joined with Eco-Cycle and the Global Anti-Incinerator Alliance (GAIA) to release *Stop Trashing the Climate*, a report documenting the link between climate change and unsustainable patterns of consumption and wasting. Authored by Brenda Platt of ILSR, with coauthors Eric Lombardi of Eco-Cycle (Boulder, Colorado) and Dave Ciplet of GAIA, the report concludes that preventing waste and expanding reuse, recycling and

Figure 1. Projection of wasting trend based on current rates of disposal, composting and recycling, through 2030



Source: Brenda Platt and Heeral Bhalala, Institute for Local Self-Reliance, Washington, DC, June 2008, using and extrapolating from U.S. EPA municipal solid waste characterization data. Takes into account U.S. Census estimated population growth. Diversion via composting and recycling is 32.5%.

Figure 2. Contribution of wasting to total U.S. greenhouse gas emissions, 2005



Source: Institute for Local Self-Reliance, June 2008. Waste disposal includes landfilling, wastewater treatment and combustion. Synthetic fertilizers include urea production. All data reflect a 100-year time frame for comparing greenhouse gas emissions. See www.stoptrashingthecolimate.org for complete reference.

composting programs — that is, aiming for zero waste — is one of the fastest, cheapest and most effective strategies available for combating climate change.

Stop Trashing the Climate also dispels myths about the climate benefits of landfill gas recovery and waste incineration, outlines policies needed to effect change, and offers a roadmap for how to significantly reduce greenhouse gas (GHG) emissions within a short period. To view the full report, visit www.stoptrashingthecolimate.org.

COST OF WASTING

An awful lot is wasted in the U.S. — 170 million tons each year of paper, plastics, metals, textiles, glass and other materials. Almost 4 million tons alone are junk mail. One-third is packaging. There are direct connections between the fact that Americans use one-third of the Earth's timber and paper and that deforestation accounts for as much as 30 percent of global greenhouse gas (GHG) emissions, and that Americans generate 22 percent of the world's GHG emissions and produce 30 percent of the world's waste.

Trash is the tip of a very big iceberg. For every ton of municipal trash, about 71 tons of waste are produced during manufacturing, mining, oil and gas exploration, agriculture and coal combustion. This requires a constant flow of resources to be pulled out of the Earth, processed in factories, shipped around the world, and burned or buried in our communities. Needless to say, at each step, energy is consumed and greenhouse gases are released into the atmosphere. Wasting equals climate change.

If this one-way flow of materials from extraction to disposal continues, by the year 2030, Americans could generate 301 million tons/year of municipal solid waste, up from 251 million tons in 2006. Figure 1 visually represents the future projection of this trend based on our current wasting patterns. And because wasting is linked to core contributors of greenhouse gases such as industrial energy use, transportation and deforestation, GHG emissions will rise with the increase in wasting.

UNDERESTIMATING EMISSIONS FROM WASTING

Unfortunately, government assessments of GHG emissions from waste take an overly narrow view of the potential for the “waste sector” to mitigate climate change. This is largely a result of inventory methodologies used to account for greenhouse gases from waste. Conventional GHG inventory data indicate that the waste sector is solely responsible for about 3 percent of U.S. and global GHG emissions.

This assessment, however, does not include the most significant climate change impact of waste disposal: We must continually extract new resources to replace those buried or burned. Figure 2 presents a contrasting view. It shows GHG emissions from the wast-

Aiming for zero waste is one of the fastest, cheapest and most effective strategies available for combating climate change.

ing sector, as well as emissions from other sectors that are integrally linked to wasting: truck transportation, industrial consumption of fossil fuels and electricity, nonenergy industrial processes, wastewater treatment, livestock manure management and the production and application of synthetic fertilizers. All in all, these sectors linked to wasting represent 36.7 percent of all U.S. GHG emissions. These are the sectors that would be impacted if more postconsumer materials were reused, recycled and composted.

Resource conservation, reduced consumption, product redesign, careful materials selection, new rules and incentives, and materials reuse, recycling, and composting have never been such a necessity as they are today. Rapid action to reduce GHG emissions, with immediate attention to those gases that pose a more potent risk over the short term, is nothing short of essential. Methane is one of only a few gases with a powerful short-term impact, and methane and carbon dioxide emissions from landfills and incinerators are at the top of a short list of sources of GHG emissions that may be quickly and cost-effectively reduced or avoided.

Leading scientists now agree that atmospheric GHG concentrations must decline over the next 15 years in order to avoid rapid and widespread climate change. Unfortunately, widely used tools to measure greenhouse gases evaluate the effects of the gases over 100 years. Over the 100-year timeline, methane has a global warming potential 25 times more potent than CO₂. But on a 20-year time horizon (reflecting the need for significant reductions over the next 15 years as just noted), this global warming potential jumps to 72 times that of CO₂. What does this mean? It means, for instance, that the impact of methane emissions from landfills in the short term are almost three times higher than reported. And it points to the need to target methane now. Based on a 20-year time horizon, methane emissions from landfills alone represent 5.2 percent of all U.S. greenhouse gases.

WOE OF "GREEN" ENERGY

Current landfill methane mitigation strategies focus on methane capture rather than methane avoidance. However, landfill gas capture systems are not an effective strategy for preventing methane emissions to the atmosphere. The portion of methane captured over a landfill's lifetime may be as low as 20 percent of total methane emitted, according to a 2007 Working Group's report to the International Panel on Climate Change (see full report for complete references). Despite best available control technologies, most methane will escape uncontrolled, as the bulk of it is generated before gas capture systems are installed on those landfill cells.

The only effective method to prevent methane emissions from landfills is to stop biodegradable materials from entering landfills. The good news is that landfill alterna-

tives such as composting and anaerobic digestion are readily available and cost-effective. Compost has the added benefit of adding organic matter to soil, sequestering carbon, improving plant growth and reducing water use — all important to stabilizing the climate. Composting is thus vital to restoring the climate and our soils and should be front and center in a national strategy to protect the climate in the short term.

Methane from landfills is far from the end of the story. A new generation of waste incinerators are being falsely promoted across the country as renewable energy, green power and as a solution to global warming. The truth is that incinerators are energy wasters rather than generators, and are significant emitters of carbon dioxide. Incinerators emit more carbon dioxide per megawatt-hour than coal-fired, oil-fired or natural-gas fired power plants. And because recycling conserves 3 to 5 times the energy these facilities purport to generate, they are better labeled as "waste of energy" or WOE facilities. In other words, incinerating trash is akin to spending 3 to 5 units of energy to make 1 unit. By destroying resources rather than conserving them, all incinerators — including mass burn, pyrolysis, plasma and gasification — cause significant and unnecessary lifecycle GHG emissions.

Incinerators, landfill gas capture systems and landfill "bioreactors" currently are being subsidized under state and federal renewable energy and green power incentive programs or carbon trading schemes. Far from benefiting the climate, subsidies to these systems reinforce a one-way flow of resources on a finite planet and make the task of conserving resources more difficult, not easier.

Incinerators are not the only problem, however. Planned landfill "bioreactors," promoted to speed up methane generation, are likely to simply result in increased methane emissions in the short term and to directly compete with more effective methane mitigation systems such as composting and anaerobic digestion technologies. Preventing potent methane emissions altogether should be prioritized over strategies that offer only limited emissions mitigation. Indeed, all landfill operators should be required to collect landfill gases; they should not be subsidized to do this.

AIMING FOR ZERO WASTE

The good news is that preventing waste and expanding reuse, recycling and composting — that is, aiming for zero waste — is one of the fastest, cheapest and most effective strategies available for combating climate change. Figure 3 illustrates an alternate path based on rising recycling and composting rates and the source reduction of 1 percent of waste per year between 2008 and 2030. Under this Zero Waste Approach, 90 percent of the municipal solid waste generated in the U.S. could be diverted from disposal facilities by 2030.

Using the U.S. EPA's WASTE Reduction Model (WARM) to estimate greenhouse gas reduction, the Zero Waste Approach — as compared to the business-as-usual approach — would reduce greenhouse gases by an estimated 406 megatons CO₂ equivalent (eq.) per year by 2030. This reduction of 406 megatons CO₂ eq. per year is equivalent to removing 21 percent of the nation's 417 coal-fired power plants.

This puts the 3Rs — reduce, reuse, recycle, along with composting — in the same league as other leading climate protection proposals such as improving national vehicle fuel efficiency, retrofitting lighting and protecting forests (See Table 1). Further, a Zero Waste Approach has greater potential for protecting the climate than environmentally harmful strategies proposed to reduce carbon emissions such as the expansion of nuclear energy. Moreover, reuse, recycling and composting facilities do not have the severe liability or permitting issues associated with building nuclear power plants or carbon capture and storage systems.

TIME FOR ACTION IS NOW — A 12-STEP PLAN

In order for a zero waste strategy to reduce U.S. GHG emissions by 406 megatons CO₂ eq. per year by 2030, the following 12 priority policies are needed:

Implement 20-year national, statewide and municipal zero waste targets: Any zero waste target or plan must be accompanied by a shift in funding from supporting waste disposal to supporting zero waste jobs, infrastructure and local strategies.

Retire existing incinerators and halt construction of new incinerators and landfills: The use of incinerators and investments in new disposal facilities — including mass burn, pyrolysis, plasma, gasification other incineration technologies, and landfill “bioreactors” — obstruct efforts to reduce waste and increase materials recovery. Eliminating investments in incineration and landfilling is an important step to free up taxpayer money for resource conservation, efficiency and renewable energy solutions.

Levy a per-ton surcharge on landfilled and incinerated materials: Many European nations have adopted significant landfilling surcharges of \$20 to \$40/ton that are used to fund recycling programs and decrease greenhouse gases. Surcharges on both landfills and incinerators are an important counterbalance to the negative environmental and human health costs of disposal that are borne by the public.

Stop organic materials from being sent to landfills and incinerators: Implement local, state and national incentives, penalties or bans to prevent organic materials, particularly food discards and yard trimmings, from ending up in landfills and incinerators (see sidebar on COOL 2012 campaign).

End state and federal “renewable energy” subsidies to landfills and incinerators: Incentives such as the Renewable Electricity

Resource conservation should be incentivized as a key strategy for reducing energy use, and subsidies to extractive industries should be eliminated.

Production Tax Credit and Renewable Portfolio Standards should only benefit truly renewable energy and resource conservation strategies, such as energy efficiency and the use of wind, solar and ocean power. Resource conservation should be incentivized as a key strategy for reducing energy use. In addition, subsidies to extractive industries such as mining, logging and drilling should be eliminated. Instead, subsidies should support industries that conserve and safely reuse materials.

Provide policy incentives for locally-based reuse, recycling and composting: Incentives should be directed to revitalize local economies by supporting environmentally just, community-based and green materials recovery jobs and businesses.

Expand Pay-As-You-Throw (PAYT) programs: Adoption of per-volume or per-weight fees for the collection of trash, such as PAYT, has been proven to increase recycling and reduce the amount of waste disposed.

Make manufacturers responsible for products and packaging: Manufactured products and packaging represent 72.5 percent of all municipal solid waste. When manufacturers are responsible for recycling their products, they use less toxic materials, consume fewer materials, design products to last longer, create better recycling systems, are motivated to minimize waste costs and no longer pass the cost of disposal to the government and the taxpayer.

Regulate single-use plastic products and packaging: In less than one generation, the use and disposal of single-use plastic packaging has grown from 120,000 tons/year in 1960 to 12,720,000 tons/year today. Policies such as bottle deposit laws, polystyrene food takeout packaging bans and regulations targeting single-use water bottles and shopping bags have successfully been implemented in several jurisdictions around the world, and should be replicated everywhere.

Regulate paper packaging and junk mail: Of the 170 million tons of municipal solid waste disposed each year in the U.S., 24.3 percent is paper and paperboard. Reducing and recycling paper will decrease releases of numerous air and water pollutants to the environment, and will also conserve energy and forest resources, thereby reducing greenhouse gas emissions.

Reject climate protection agreements that incorporate burning and disposal: Decision-makers and environmental leaders should reject climate protection agreements and strategies that embrace landfill and incinerator disposal. Rather than embrace agreements and blueprints that call for supporting waste incineration as a strategy to combat climate change, such as the U.S. Conference of Mayors Climate Protection Agreement, decision-makers and environmental organizations should adopt climate blueprints that support zero waste. One example of an agreement that will move cities in the right direction for zero waste is the Urban



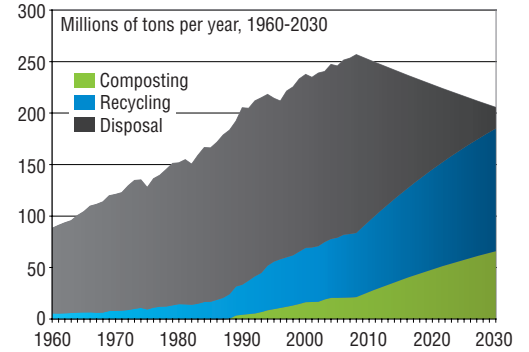
Artwork for the cover of this issue of BioCycle is from the poster created for the "Stop Trashing the Climate" campaign being developed by the organizations involved with the report. The poster features "Clay," who's figured out that recycling 90 percent of his discards equates to shutting down 21 percent of U.S. coal-fired power plants.

Environmental Accords signed by 103 city mayors worldwide.

Assess the true climate implications of the waste sector: Measuring greenhouse gases over the 20-year time horizon, as published by the Intergovernmental Panel on Climate Change, is essential to reveal the impact of methane on the short-term tipping point. Also needed are updates to the U.S. EPA's Waste Reduction Model (WARM), a tool for assessing greenhouse gases emitted by solid waste management options, as well as new models to accurately account for the impact of local activities on total global emissions and to compare the lifecycle climate impact of different energy generation options.

BOTTOM LINE

Figure 3. Projection of disposal, composting and recycling based on zero waste approach, through 2030



Source: Brenda Platt and Heeral Bhalala, Institute for Local Self-Reliance, Washington, DC, June 2008. Past tonnage based on U.S. EPA municipal solid waste characterization data. Future tonnage based on 90% diversion by 2030, and 1% source reduction per year between 2008 and 2030. Takes into account U.S. Census estimated population growth.

By cutting waste, we would not only better protect the planet's climate, we would also double or triple the life of existing landfills, eliminate the need to build expensive new incinerators and landfills, create jobs,

Table 1. Greenhouse gas abatement strategies: Zero waste path compared to commonly considered options

Greenhouse Gas Abatement Strategy	Annual Abatement Potential by 2030 (megatons CO ₂ eq.)	% of Total Abatement Needed in 2030 to Stabilize Climate by 2050 ¹
Zero Waste Path		
Reducing waste through prevention, reuse, recycling and composting	406	7.0
Abatement Strategies Considered By McKinsey Report²		
<i>Increasing fuel efficiency in cars and reducing fuel carbon intensity</i>	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
<i>Expanding & enhancing carbon sinks</i>	440	7.6
Afforestation of pastureland and cropland	210	3.6
Forest management	110	1.9
Conservation tillage	80	1.4
<i>Targeting energy-intensive portions of the industrial sector</i>	620	10.7
Recovery and destruction of non-CO ₂ 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
<i>Improving energy efficiency in buildings and appliances</i>	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
<i>Reducing the carbon intensity of electric power production</i>	800	13.8
Carbon capture and storage	290	5.0
Wind	120	2.1
Nuclear	70	1.2

Source: Jon Creyts et al, Reducing U.S. Greenhouse Gas Emissions: How Much and at What Cost? U.S. Greenhouse Gas Abatement Mapping Initiative, Executive Report, McKinsey & Company, December 2007. Available online at: <http://www.mckinsey.com/client-service/ccsi/greenhousegas.asp>.

¹ In order to stabilize the climate, U.S. greenhouse gas emissions in 2050 need to be at least 80 percent below 1990 levels. Based on a straight linear calculation, this means 2030 emissions levels should be 37 percent lower than the 1990 level, or equal to 3,900 megatons CO₂ eq. Thus, based on increases in U.S. greenhouse gases predicted by experts, 5,800 megatons CO₂ eq. in annual abatement is needed in 2030 to put the U.S. on the path to help stabilize the climate by 2050.¹

² Italicized headings are main categories analyzed in McKinsey report. Subcategories are a sampling of key abatement strategies evaluated within each category.

COOL 2012 CAMPAIGN

IN APRIL, the COOL 2012 campaign was launched at *BioCycle*'s 24th Annual West Coast Conference. COOL 2012 — Compostable Organics Out of Landfills by 2012 — is a grassroots public education and outreach strategy to enable local governments to divert compostable organics out of landfills and incinerators and back to soils via composting and anaerobic digestion. The core campaign message is: Getting COOL is the quickest and cheapest way to immediately reduce your community's greenhouse gas emissions. The recently released *Stop Trashing the Climate* report provides data to support that message. The COOL 2012 website — www.cool2012.org — is loaded with resources that communities can use to initiate new organics diversion programs or to expand existing ones as part of their zero waste journey.

The campaign was organized and launched by the GrassRoots Recycling Network, *BioCycle* and Eco-Cycle. Current campaign sponsors include White Wave Foods and Eco-Products. COOL 2012 Workshops are a core component of the campaign. Presentations from the inaugural workshop held in conjunction with the campaign launch are available on the COOL website. The next workshop is scheduled for Sunday, October 5, 2008 in Madison, Wisconsin (preceding *BioCycle*'s 8th Annual Conference on Renewable Energy From Organics Recycling, October 6-8). The first part of the workshop presents Zero Waste Community Planning tools; the second part highlights strategies to get compostable organics out of the landfill. For additional information and to register, visit www.cool2012.org.

build healthier and more equitable communities, restore the country's topsoil, conserve valuable resources and reduce our reliance on imported goods and fuels. ■

Brenda Platt is Co-Director of the Institute for Local Self-Reliance in Washington, DC (www.ilsr.org). Eric Lombardi is the Executive Director of Eco-Cycle in Boulder, Colorado (www.ecocycle.org). The full report, Stop Trashing the Climate, can be downloaded at www.stoptrashingthecclimate.org.

Reprinted From:
August, 2008

BIOCYCLE

ADVANCING COMPOSTING, ORGANICS RECYCLING
AND RENEWABLE ENERGY

419 State Avenue, Emmaus, PA 18049-3097
610-967-4135 • www.biocycle.net

BIOCYCLE

Get The Most Valuable Resource On Composting, Organics Recycling & Renewable Energy

YES, please enter my subscription to *BioCycle*, The Magazine For Advancing Composting, Organics Recycling & Renewable Energy at the special introductory rate for the term checked on right.

Name _____

Affiliation _____

Address _____

City _____ State _____

Zip _____

BC INTRO PDFILT

One Year (12 issues) \$43

A savings of \$31

Two Years (24 issues) \$73 A savings of \$47

Canada and Foreign — please add \$20 per year for postage;
Checks payable to BioCycle in U.S. Funds only.

Payment enclosed Send Invoice

Visa/Mastercard American Express

Card No. _____

Expires _____

Your Satisfaction Guaranteed: If you ever decide *BioCycle* isn't helping you during the term of your subscription, we'll mail your money back in full.

BIOCYCLE 419 STATE AVENUE, EMMAUS, PA 18049
Phone: (610) 967-4135 • Fax: (610) 967-1345

Subscribe online: <http://www.biocycle.net> or email biocycle@jgpress.com

