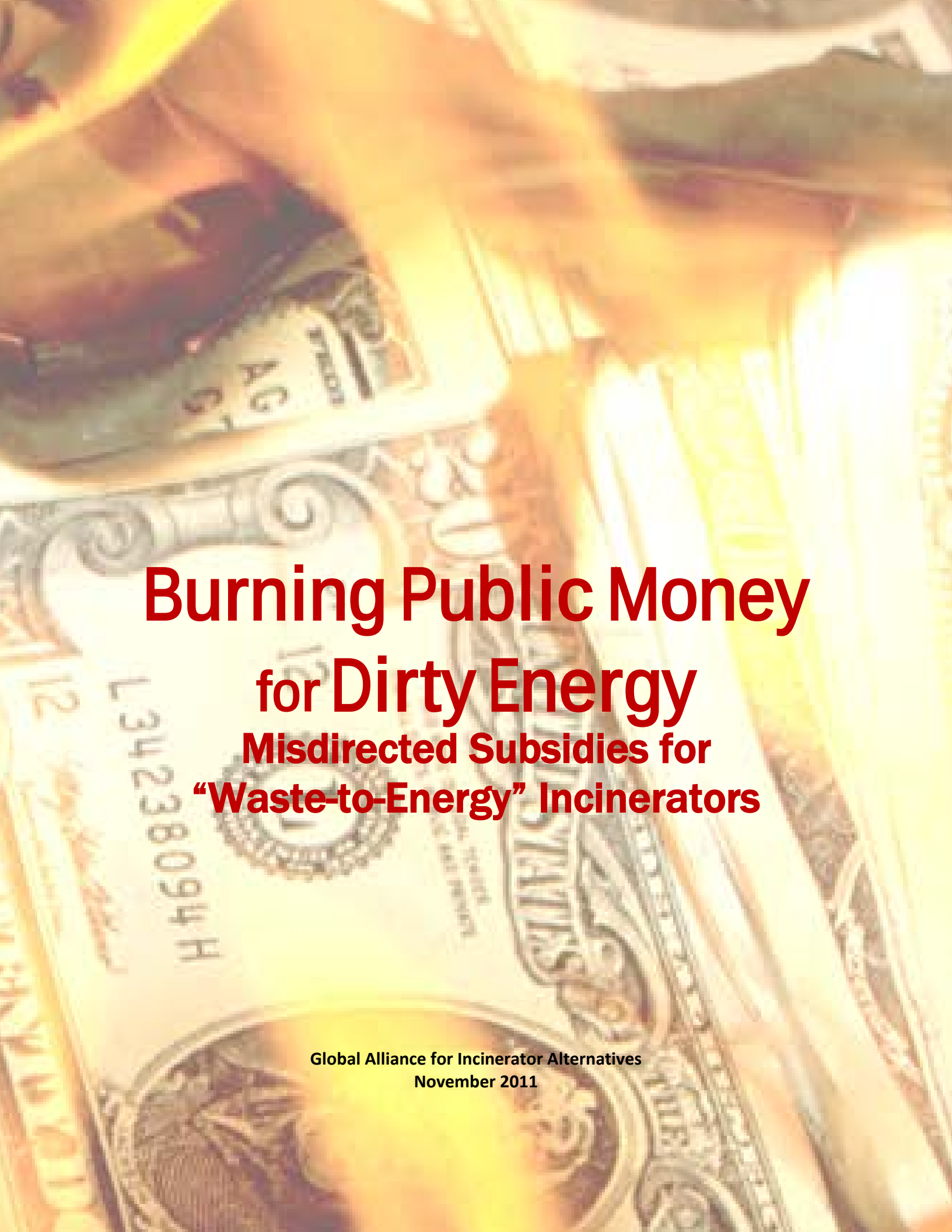

Burning Public Money for Dirty Energy

Misdirected Subsidies for "Waste-to-Energy" Incinerators

Global Alliance for Incinerator Alternatives

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GAIA is a worldwide alliance of more than 650 grassroots groups, non-governmental organizations, and individuals in over 90 countries whose ultimate vision is a just, toxic-free world without incineration.

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INTRODUCTION

While federal, state and civic lawmakers puzzle over how to address a growing national economic crisis, corporate America continues to push for subsidies that gift them with hard-earned taxpayer money. Meanwhile, the burdens of pollution, unemployment and poverty have reached critical tipping points. This volatile scenario begs a close examination of the public subsidies handed over to the polluting corporations that are its root cause.

This report outlines how "waste-to-energy" (WTE) incinerators – the costliest and most carbon-intensive energy corporations – are poised to take advantage of taxpayer subsidies, unless fiscally-responsible judgment prevails in federal and state policy arenas.

A 2007 energy subsidy paper by the subsidy-research organization Earth Track reveals that direct subsidies such as tax credits, export subsidies and loan guarantees for U.S. energy companies have amounted to far upwards of $75 billion per year.[1] Earth Track's Doug Koplow cautions "*estimates of U.S. energy subsidies vary considerably - ranging from 200 million to 1.7 trillion dollars, depending on how the subsidies are tallied, and which subsidies are counted."*[2]

Many dirty energy companies, such as "clean coal", nuclear, biomass and "waste-to-energy," have lobbied policy makers under the guise of "renewable energy" promising to deliver energy security, jobs and climate mitigation. Their trade associations and lobbyists continue to persuade lawmakers that these toxic and expensive technologies merit support as energy alternatives. Policies such as the California cap & trade bill[3] and incentives such as state Renewable Portfolio Standards (RPS) are being bent to serve the needs of these power companies.

The incinerator industry is at the fore of this effort. With 87 energy plants around the nation currently burning around 33 million tons of municipal solid waste (MSW) per year, incinerators generates only a tiny fraction (approximately 1700 MWh)[4] of the electricity produced nationally by major players like coal or natural gas. In efforts to secure renewable energy subsidies, the incinerator industry has branded itself as "waste-to-energy" (WTE) plants, making the following misleading claims:

- WTE incineration recovers energy embedded in waste streams
- WTE incineration reduces climate pollution from landfills
- By generating electricity, WTE incineration reduces emissions from fossil fuels

These claims lack scientific credibility, and clearly conceal a much larger story the incinerator industry does not wish to share. Recycling and reuse save much more energy than can be generated through incineration because manufacturing with recycled materials serves to reduce energy use throughout the materials supply-chain, from extraction to waste. Less energy use means that recycling, composting and

reuse also create much less climate pollution than incineration. Finally, WTE incinerators are not a viable alternative to fossil fuels, because they emit more carbon dioxide per (CO_2) unit of energy (2988 lbs/MWh) than coal-fired power plants (2249 lbs/MWh).[5]

Municipal solid waste has very low energy value due to its high (over 60%) organic content (food discards, yard waste, paper, etc.). A majority of the balance includes fossil fuels products like plastic, and fossil-fuel intensive products like metal and glass. While burying waste in landfills is indeed a major source of greenhouse gas (GHG) emissions and toxic pollutants, recent Life Cycle Analysis (LCA) comparisons of both disposal practices show that WTE incinerators only come out ahead (with lower GHG emissions) when they recover heat *and* when the landfill gas methane capture rates are low.[6]

The truth about WTE incinerators is that their carbon-intensity, cost, health and environmental impacts disqualify any claims this industry makes about being "renewable". A recent study published in *American Economic Review* found that solid waste combustion has the highest ratio of negative environmental and economic impacts (gross external damage) to benefits, among U.S. industries.[7]

What is egregious about the incinerator industry's claims is that burning society's discards entails destroying billions of dollars' worth of precious materials from a finite resource base (paper, wood, plastic, glass, metals and food discards) that could be recycled into the economy to create much-needed local jobs in communities across the country.

By allowing WTE incinerators a seat at the energy subsidies trough, Congress and state legislators are creating an economic barrier to the growth of a zero waste economy - where resources are recovered, materials are put to "best and highest end use," energy is conserved, pollution is vastly reduced, and more jobs are created.

Nationally, less than 34% of municipal waste is recycled in the USA today, but cities such as San Francisco, Seattle, and Oakland have shown that diverting 75% or more of this waste is achievable. Applying zero waste strategies such as recycling, reuse and composting in order to achieve a 75% recycling rate nation-wide would generate over 1.5 million new jobs in collections. [8] This critical commitment would also serve to reduce vast amounts of climate pollution, equivalent to taking 50 million cars off U.S. roads, and reduce many forms of toxic and hazardous pollution.

Incineration is also the most expensive form of energy generation in the U.S., per unit of electricity produced. The U.S. Energy Information Administration found that the costs of building WTE incinerators are 60% higher than nuclear power, and the operating costs are ten times higher than coal.[9] These massive costs are typically paid through waste disposal fees (e.g., tipping fees) charged to municipalities and counties, where public money pays the bill. Not only do these communities shoulder the cost burden of these facilities, which can be upwards of $500 million for a large WTE incinerator, they frequently assume the risk associated with loans and debt service payments for the facility.

Over a twenty-year period, the city of Detroit, Michigan paid out over $1.2 billion in costs and debt servicing for their WTE incinerator, coming close to bankruptcy on three different occasions in that time. Camden, New Jersey faced a similar crisis last year when they were unable to make their incinerator bond payments.

In October 2011, Harrisburg, Pennsylvania[10] became the largest city in the country to declare bankruptcy, due to its $300 million toxic debt from fixing and upgrading a WTE incinerator operated by Covanta. Local environmental justice groups forewarned the city of Harrisburg of this outcome when they made this financial decision eight years ago.[11] The Harrisburg incinerator sits next to a city housing project, where working poor and people of color face the lion's share of the incinerator's air pollutants.

This is a trademark of the incinerator industry: seeking the path of least resistance and cost, when looking to locate their toxic technologies. So, not only do people of color and working poor communities have to deal with higher rates of disease and respiratory illness due to incinerator emissions, they also have to actually pay to be subjected to this pollution through their taxes, waste fees, and utility rates.

Dr. Robert Bullard, one of the country's leading environmental justice scholars and advocates, calls this "U.S. Energy Apartheid," and believes that energy policies today are driving a new wave of racist industry initiatives,[12] where new waste and biomass incinerator proposals are largely being built in poor white, African American, Latino and Indigenous People's communities. Bullard's 2007 report, *Toxic Waste and Race at Twenty,* illustrates how people of color and the poor in the U.S. are more likely to have toxic waste disposal facilities like incinerators sited in their communities today than they were over 20 years ago. [13]

So while our energy policymakers seek to make more public funds available for toxic, climate polluting and exorbitant garbage burning plants, they should be keenly aware that these subsidies also fortify those invisible barriers in society today – walls that determine whether your children have a much higher chance of getting asthma or cancer, based on the color of your skin[14] and size of your paycheck.

SCOPE OF REPORT

Burning Public Money for Dirty Energy presents an overview of how U.S. energy policies are creating a range of subsidies for municipal waste incineration (MSW) projects, including emerging waste burning technologies of gasification, pyrolysis and plasma arc incineration. This report also identifies incentives for a wider spectrum of industries that are starting to identify as "waste-to-energy" projects, such as landfill gas to energy systems and anaerobic digestion (or biogas) facilities. Developers promoting waste technologies have increasingly positioned their proposals as energy generation projects in order to take advantage of these new energy subsidies and incentives.

These energy subsidies do not account for the massive externalized costs from dirty energy, such as the cost of public health impacts, the cleanup costs after destructive mining, and the disposal of toxic ash from power plants. Nor do these estimates include a number of other upstream subsidies given to resource extraction industries that distort the markets in favor of energy companies pursuing high-risk, toxic and costly technologies such as nuclear power, clean coal, or waste-to-energy. For a review of these upstream subsidies, a presentation by Doug Koplow for the Product Stewardship Institute titled "Undermining Sound Resource Use through Subsidies to Primary Materials and Waste Management" is available at http://earthtrack.net/files/uploaded_files/Recycling%20subsidies_Koplow_r.pdf

Burning Public Money for Dirty Energy focuses primarily on the energy production sector, looking at the production of both electricity and fuel as the primary outputs for most WTE incinerator projects. An examination of policies that indirectly subsidize or otherwise contribute to the proliferation of waste – such as excess packaging and single-use disposables – is outside the scope of this report.

This report does not examine a range of federal subsidies designated for biofuels but increasingly attractive to some waste to fuel projects, such as the Volumetric Ethanol Excise Tax Credit *(*VEETC*),* Volumetric, the Volumetric Butanol Excise Tax Credit (VBETC), and the Cellulosic Production Tax Credit (CPTC). This report also does not examine Small Producer Production Tax Credit for liquid fuels from waste. Tax-exempt bonding for WTE and landfills and accelerated depreciation for WTE facilities, are shown through anecdotes of local and state subsidies.

For a broader overview of federal interventions in the energy sector, it is worth reading two additional reports:

1. The 2008 edition of a study published by the U.S. Energy Information Administration: *Federal Financial Interventions and Subsidies in Energy Markets.*[15]
2. A critique of the former EIA study by Earth Track that details how the numbers in the U.S. EIA study are low: *EIA Energy Subsidy Estimates – A Review of Assumptions and Omissions.*[16]

Other resources on state energy policies and subsidies include a 2007 National Governors Association report entitled *Clean and Secure Energy Actions* that provides a fairly up-to-date overview of state-level policies across the energy sector, and a database of state incentives for renewables and efficiency found online at http://www.dsireusa.org/.

Incineration and "Waste-to-Energy"

The term incineration refers to various waste treatment technologies that burn commercial, residential, industrial or hazardous waste. Municipal solid waste (MSW) incineration converts discarded materials, such as paper, plastics, metals and food scraps, into a variety of waste products, including bottom ash, fly ash, combustion gases air pollutants, wastewater, wastewater sludge and heat. There are 87 MSW incinerators in the U.S. Most of these are used to generate electricity.

Biomass incineration uses organic feedstocks such as wood chips, construction debris, forest waste, agriculture waste and municipal waste, although "biomass" is loosely applied to mixed waste streams. Biomass incinerators waste resources that would better be conserved, composted, or returned to the earth. For a full report on public subsidies for biomass incineration, see: http://www.nobiomassburning.org/BAP/Home.html

In recent years, the incinerator industry has tried to expand their sector by marketing their technologies as "waste-to-energy" (WTE) facilities, leveraging claims of "reduced greenhouse gas emissions" and "clean energy," to seek public subsidies. Other waste industries such as landfill gas and anaerobic digestion plants have begun to adopt the term "waste-to-energy" in order to qualify for similar subsidies. Some companies like Covanta use the term "energy from waste" (EFW).

These marketing efforts conceal the many environmental problems with WTE incinerator and landfill technologies and the loss of recyclable materials when they are burned for their Btu value rather than recycled back into the economy for a higher end use.

KEY REPORT FINDINGS

- **Having "waste-to-energy" (WTE) counted as a "renewable" energy creates a lifeline for an expensive industry that requires public funds to gain a competitive advantage over other approaches to waste management.**
- **Most federal energy subsidies that benefit incineration are actually meant to support the development of real renewable energy sources such as wind, solar and micro-hydro, which should not have to compete against dirty energy for the same funding.**
- **Although WTE projects currently access only a portion of the renewable energy subsidies available, these policies set a precedent for increased financial support for the industry and shape the political, technological, economic, and legal environment.**
- **Federal energy and climate policy is slow moving, but such policies are moving forward much faster at the state level. The State Renewable Portfolio Standards (RPS) is a powerful driver for the expansion of the incinerator industry, in addition to opening the door for a range of state and federal subsidies.**

Subsidies of all types are rapidly evolving in the energy sector. Perhaps one of the most skewed markets in the global economy, the energy sector is inundated with vast amounts of government interventions, and support at every level. Historically, most of these subsidies have been for traditional fossil fuels and nuclear production. However, since the passage of the Energy Policy Act of 1992, incentives for alternative and renewable energy production have steadily grown.

There are nearly a dozen major federal policies that provide incentives for WTE projects. Almost all of these are broad policies that were created under the auspices of advancing alternative energy sources and they are not focused on WTE per se. In general these incentives more heavily impact other forms of energy (such as wind and solar). Indeed, since the WTE industry has seen stagnant growth in the past decade, many of these subsidies are not actively providing much federal funding to WTE projects. But they still create the political, technological, legal, and economic environment to foster the growth of the WTE industry, and this environment will shift to material support in the coming years without clean energy, zero waste and environmental justice advocates campaigning to change the landscape.

Most experts agree that comprehensive federal legislation on climate and energy issues is forthcoming. While a series of Energy Policy Acts have created strong direction on energy, these directions will undoubtedly shift once federal climate legislation is passed. State-based policies are in a similar situation, however many states are leading the way with more ambitious and comprehensive climate and energy regulations.

A number of states[17] (California, Hawaii, Indiana, Virginia, Maryland, and others) have already included benefits for WTE incineration in their energy policies. And while some states address waste stream issues more effectively in other policies (for example, waste reduction policies), their inclusion in energy policies provides the most advantages for accessing public funding.

STATE AND LOCAL SUBSIDIES FOR WTE INCINERATOR PROJECTS

Renewable Portfolio Standards:

With the failure of federal climate legislation in 2009,[18] and the absence of a federal renewable electricity standard, state renewable portfolio standards (RPS) are now the governing regulatory programs that mandate the production of "renewable energy." Taxpayer and ratepayer subsidies make it possible for the mandates to be fulfilled by providing the funding to build and operate new renewable energy generating sources.[19]

The RPS is one of the biggest drivers of alternative energy. Compliance with these standards takes various forms, but in general are legal requirements that a certain percentage of electricity produced in a state be from "renewable" sources. State programs define qualifying technologies differently, or in varying classes. Qualifying facilities are authorized to sell electricity and "renewable energy credits" (RECs), with each qualifying facility being awarded one REC per MWh of power produced each year.

Current market value in the Regional Greenhouse Gas Initiative (RGGI) for the Northeast states exceeds $20. The average value of a REC in 2010 was between $20 and $40 dollars.[20] At this rate, a mid-size 90 WTE Incinerator can earn about $23 million per year by selling RECs, depending on the going price. This is calculated as follows:

Using the Covanta Delaware Valley WTE Incinerator in Chester, Pennsylvania, as an example, that would be 90 MW x 24 hours x 365 days = 788,400 x 30.00 =$23,652,600 annually.

As of July 2010, 29 states (and Washington DC) have a mandated RPS, and 7 more have "goals", which are currently voluntary but may become legally binding in the future.

There is a Federal Renewable Fuel Standard, and some "waste-to-energy" qualifies under the RFS. There are also other state grants, loans and incentives for biomass incinerators, where waste incineration is often included in the state RPS definitions of biomass. A comprehensive database is maintained via the DSIRE website. [21]

Table 1: State RPS Overview[22][23]

STATE	***RPS Targets***	***MSW qualifies?***	***Anaerobic Digestion qualifies?***	***Landfill Gas qualifies?***	***Biomass qualifies?***
Arizona	*15% by 2025*	***No***	*Yes*	*Yes*	*Yes*
California	*33% by 2020*	*Yes**	*Yes*	*Yes*	*Yes*
Colorado	*30% by 2020, 10% for co-ops and large muni's*	***No***	*Yes*	*Yes*	*Yes*
Connecticut	*23% by 2020*	*Yes*	*Yes*	*Yes*	*Yes*
Delaware	*20% by 2020*	***No***	*Yes*	*Yes*	*Yes*
District of Columbia	*20% by 2020*	*Yes*	*Yes*	*Yes*	*Yes*
Hawaii	*40% by 2030*	*Yes*	*Yes*	*Yes*	*Yes*
Illinois	*25% by 2025*	***No***	*Yes*	***No***	*Yes*
Iowa	*105 MW*	*Yes*	*Yes*	***No***	*yes*
Kansas	*20% by 2020*	***No***	*Yes*	*Yes*	*Yes*
Maine	*30% by 2000, New 10% by 2017*	*Yes*	***No***	*Yes*	*Yes*
Massachusetts	*22% by 2020, new 15% by 2020, increases 1% /year*	***No***	*Yes*	*Yes*	*Yes*
Maryland	*20% by 2022*	*Yes*	*Yes*	*Yes*	*Yes*
Michigan	*10%+ 1100MW by 2015*	*Yes*	*Yes*	*Yes*	*Yes*
Minnesota	*25% by 2025*	*Yes*	*Yes*	*Yes*	*Yes*
Missouri	*15% by 2021*	*Yes*	***Yes***	***Yes***	*Yes*
Montana	*15% by 2015*	***No***	*Yes*	*Yes*	*Yes*
Nevada	*25% by 2025*	*Yes*	*Yes*	*Yes*	*Yes*
New Hampshire	*23.8% by 2025*	*Yes*	*Yes*	*Yes*	*Yes*
New Mexico	*20% by 2020, 10% by 2020 for co-ops*	***No***	*Yes*	*Yes*	*Yes*
New Jersey	*22.5% by 2021*	***Case by case***	*Yes*	*Yes*	*Yes*
New York	*29% by 2015*	***No***	*Yes*	*Yes*	*Yes*
North Carolina	*12.5% by 2021, 10% by 2018 coops and munis*	***Case by case***	*Yes*	*Yes*	*Yes*
Ohio	*25% by 2025*	*Yes*	*Yes*	*Yes*	*Yes*
Oregon	*25% by 2025, 5-10% for smaller utilities*	*Yes*	*Yes*	*Yes*	*Yes*
Pennsylvania	*18% by 2021*	*Yes*	*Yes*	*Yes*	*Yes*
Rhode Island	*16% by 2020*	***No***	***No***	***No***	*Yes*
Texas	*5880 MW by 2015*	***No***	*Yes*	*Yes*	*Yes*
Washington	*15% by 2020*	***No***	***No***	***No***	***Yes***
Wisconsin	*10% by 2015*	*Yes*	*Yes*	*Yes*	*Yes*

Case studies of local and state subsidies

Detroit, Michigan[24]

Detroit's incinerator has pushed the city to the brink of bankruptcy on three separate occasions. The economic impact has included cutting key public services, including city worker jobs, in order to mitigate plummeting municipal bond ratings.[25]

Detroit is home to one of the world's largest WTE incinerators (with a capacity of over 3600 tons per day). In its first twenty years of operation, this facility has cost Detroit residents over $1.2 billion dollars in debt service payments alone. Over these years, Detroit spent over $1 billion more for trash disposal than if they had never built the incinerator, and sent the trash to landfills to be buried.

On October 8, 2010 the then-owner Covanta Energy closed the incinerator as a financial failure. Then on November 22, 2010 Atlas Holdings of Connecticut bought the incinerator as well as the Detroit Thermal steam loop, claiming that the combined system could be financially viable. Atlas Holdings formed Detroit Renewable Energy with three subsidiaries – Detroit Renewable Power (the trash incinerator), Detroit Thermal, and Hamtramck Power Services.

On December 17, 2010 the Greater Detroit Resource Recovery Authority (GDRRA) awarded a no-bid 11-year contract for waste disposal to Detroit Renewable Power. As of February 2011 the incinerator has been operating only one of its three furnaces, burning about 1,500 tons of trash per day or about 40% of its full operating capacity. Throughout its twenty-plus year history the incinerator has never operated at more than about 65% of its full operating capacity.

Atlas Holdings**,** the new incinerator owner, is seeking several state subsidies, as shown in the following chart.

State Incentive	Estimated Value
Brownfield Michigan Business Tax (MBT) Credit: (based on an eligible investment of approximately $32.8 million)	
Waste to Energy Facility	$4,105,500
Detroit Thermal Facility	$325,000
Pollution Control Property Tax Exemption (20 years)	$920,000

PA 328 Property Tax Abatement (Personal Property; 12 years)	$2,924,000
Michigan Business Tax (MBT) Credits and Other Tax Savings	
Industrial Personal Property Tax Relief (12 years)	$1,190,000
Sales Tax Exemptions (Initial Qualified Investment)	$1,134,000
MBT Compensation Credit (12 years)	$737,000
MBT Investment Tax Credit (Initial Qualified Investment)	$2,864,000
MBT Research and Development Credit (Initial Qualified Investment)	$48,000
Total Value of Proposed Incentives	$14,272,500

Incentives Profile for Atlas Holdings, LLC (Michigan Economic Development Corporation)

The Brownfield MBT Credit is not based on land restoration, but the less common claim of restoration of obsolete assets. The Detroit Brownfield Redevelopment Authority initially approved this credit. But after broad public opposition organized by local coalition Zero Waste Detroit, the Detroit City Council voted to reject the Brownfield tax credits entirely**.** The $325,000 tax credit for Detroit Thermal was approved last spring but the $4.1 million for the incinerator was rejected by a super majority vote of 6-3. Given the public backlash, no action has been taken on their request for a $75 million bond issue from the state. As of November 2011, Detroit Renewable Power has approached the city to seek approval for the Brownfield Credits once again.

Current subsidies that Detroit Renewable Power has been awarded include the Federal Tax Credit for generating electricity from a Resource Recovery Facility and Renewable Energy Credits under Michigan's Renewable Portfolio Standard (RPS). The Michigan RPS recognizes existing incinerator capacity but no new facilities.

California

Waste Incineration qualifies in the California RPS in a limited way. The RPS arbitrarily includes only one of the three WTE incinerators in the state (which are housed in environmental justice communities in Long Beach, Commerce and the Central Valley).

The state RPS also allows waste gasification, but *only* if the facility has no emissions of any kind, including greenhouse gases. To date this has precluded any gasification facilities from obtaining formal

status under the California state RPS. However there is currently a debate between state agencies and public interest organizations over the legality of a RPS pre-eligibility status that was granted to a proposed plasma arc incinerator that would be operated by a company called Plasco. The company admits that there would be emissions, which thus makes it ineligible according to state law. The California Energy Commission, despite the state law, awarded the pre-eligibility status. The plasma incineration project is meeting stiff opposition from the farm worker community of Gonzales, where the company wants to build.

In September of 2011, Governor Jerry Brown signed into law a statewide recycling benchmark of 75% by the year 2020. Recycling is already a strong player in the California economy, creating over 125,000 new jobs in recent decades. Between state RPS goals of 30% renewable electricity by 2020, the new mandate, and the cap and trade mechanism that came out of AB 32, it remains to be seen whether the state will can keep its commitment to the development of a just and resilient recycling/zero waste economy, or whether these laws will instead serve to expand burn and bury practices.

New York State

Covanta Energy has applied to the NY Public Service Commission (PSC) to be included in the state Renewable Portfolio Standard (RPS). Over 2000 people and organizations submitted comments to the PSC in opposition. The Attorney General and a trade organization representing wind and solar businesses are also in opposition. The opposition is around the use of renewable energy credits to support dirty energy, and concerns that this would divert funds from clean, renewable energy projects.

NY State funding for incinerators came from a pot of environmental funding for closing outdated landfills (the hundreds of landfills that predated modern standards and the 1988 NY Solid Waste Management Act) and also funding for recycling. Over time, recycling programs have received a small fraction of the grant support that incinerators and landfills received. As in a few other states, NY ratepayers are charged on each and every utility bill with a systems benefit charge (SBC), which is used to support energy efficiency and renewable energy. While citizens groups have objected that too much support goes to utility companies rather than community organizations to implement these programs, this money has not yet been used for dirty energy.

In upstate NY, Washington and Warren Counties spent more than $5.5 million in 2009 to subsidize the Hudson Falls incinerator. Owned by the Warren/Washington County Industrial Development Authority, and operated by Wheelabrator (a subsidiary of Waste Management Inc.), this debt-plagued incinerator has saddled residents with exorbitant bills for debt service, operating losses, and other expenses.

Under a deal approved by the two county boards of supervisors two decades ago**,** despite tremendous citizen opposition, local taxpayers are legally obligated to pay off the construction debt and cover the

operating losses of a privately run trash incinerator in Hudson Falls. The incinerator has continuously required public subsidies since the day it opened in 1992. The two counties are also bound by long-term contracts to pay above-market disposal fees ($69 a ton) at the incinerator for the trash they generate.

Meanwhile, the tipping fees charged to the waste corporations supplying the incinerator with the most trash have dropped as low as the teens in recent years, due to a "shortage" of trash. In November 2011, Wheelabrator Hudson Falls LLC will purchase the incinerator for the sum of $3.13 million, as agreed in its 2003 operating contract.

In 2009, Washington County taxpayers had to pay $1.75 million as their share of a 2008 incinerator shortfall.[26] This payment was required to meet debt service, operation & maintenance costs, Wheelabrator profits, as revenues from tipping fees and the sales of electricity were insufficient. Such subsidies have taken precedence over funding recycling in this rural county of 63,000 *people.* The county has no money for a recycling coordinator or for public education about recycling. In 2010, the Board of Supervisors cut $300,000 in recycling equipment costs from the county budget and attempted to reduce hours and staffing at transfer facilities. Warren and Washington Counties have some of the lowest recycling rates in the state. The need to keep feeding the incinerator, which was built to burn more than three times the garbage that the two counties produce annually -- provides a powerful disincentive to recycling and waste reduction programs.

100 miles downstream, on the Hudson River, Dutchess County pays several million dollars a year to Covanta Energy, which operates an incinerator in Poughkeepsie. Disposal fees at this incinerator are so high that local officials have talked about imposing a “flow control” law to capture all the trash from the county’s 300,000 residents – and adding boilers capacity to accommodate the extra trash. Available data has suggested that the county currently recycles only about 11 percent of its waste. The county doesn’t expect to pay off its incinerator debt until 2027, when the plant is over 40 years old.

In 2009 a Green Ribbon commission recommended that Dutchess County commit to a 70 percent recycling goal and an incinerator phase-out within two to four years. The Dutchess County Incinerator has been the subject of ongoing investigative reporting in the Poughkeepsie Journal, where the following information appeared in a May 2009 article.[27]

> ***Based on an independent report commissioned by the County, it describes the incinerator as inefficient, inexpensive and in debt. It was built with $40 million in bonds and received a state grant of $13.4 million. Its current bond debt of $49 million extends to 2027. It has been referred to as a dinosaur by county legislators. In 2008 it took in $11 million in tipping fees, and $4.2 million in electricity revenues. However it still needed a $3.5 million subsidy from the county to break even. The County has budgeted a larger amount for 2009-- $6.3 million.***

In 2011 Taylor Biomass Energy, LLC, which is being built to burn municipal solid waste as well as some

waste wood, was awarded a $100 million loan guarantee by the U.S. Department of Energy under Section 1603 of the Recovery Act (stimulus program).

The facility, which uses unproven technology, also received a pass from the New York State Department of Environmental Conservation (DEC). The DEC decided to exempt the Taylor incinerator from its own incinerator regulations and allowed the project to proceed, requiring an application for a Title V permit in the future. This process severely limited public scrutiny of the project.

Maryland

Maryland is a key battleground state. On top of the three existing waste incinerators, it is the only state that has two new proposals for conventional mass-burn incinerators – Frederick County (Wheelabrator) and Energy Answers International (Baltimore), as well as a proposal to triple the capacity of the Hartford Incinerator.[28]

In the summer of 2011, Governor Martin O'Malley of Maryland signed state incinerator bills that provided WTE incinerators a "Tier 1" status in Maryland's RPS, despite broad public opposition from state environmental and public health advocates.

The state's three existing incinerators in Baltimore (Operated by Wheelabrator), Harford (Operated by Energy Recovery Inc.) and Montgomery County (Operated by Covanta) currently qualify for "Tier 2" renewable energy credits under the state RPS. Tier 2 credits are worth half of what top-tier credits sell for from solar, wind and other Tier 1 projects. The Montgomery trash burner earned $21 million in 2010 on the electricity it produced, while getting another $430,000 by selling its renewable energy credits. Upgrading to Tier 1 could bring in an additional $240,000 a year, according to a legislative analysis.[29]

Assuming the other WTE incinerators receive the same amount proportional to their MW size, the Tier 1 RECs for these facilities would be as stated in the table below.

Maryland WTE Incinerators	Capacity (MW)	Annual Subsidy
Montgomery Dickerson	68	$ 240,000
Baltimore BRESCO	60	$ 212,471
Proposed Frederick incinerator	45	$ 158,824
Proposed Baltimore incinerator	140	$ 494,118
TOTAL	313	$ 1,105,412

Like New York, Montgomery County has a *System Benefit Charge* that represents approximately 70% of the county system revenues. This charge is essentially a pre-paid fee collected on the property tax bill. If the owner fails to pay this charge, the county can enforce payment through foreclosure (similar to if the owner had failed to pay property taxes).[30]

According to Brenda Platt of the Institute for Local Self-Reliance, the proposed Frederick County garbage incinerator, which would cost over $500 million to build and is designed to burn up to 1500 tons of garbage per day, is roughly 25 times more expensive than a similarly sized recycling facility in Elk Ridge, MD. The proposed Frederick incinerator would be financed with public debt, and appears already to be crowding out a legitimate Tier 1 renewable energy generator. An anaerobic digestion facility that would process food waste and support greenhouse agriculture in Frederick County is having challenges because both would compete for some of the same materials.

A recent report by the Environmental Integrity Project[31] found that Maryland's three existing WTE Incinerators produced more pollution per hour of energy than each of Maryland's four largest coal-fired power plants. These emissions include CO_2, as well as toxic pollutants such as mercury and lead.

Camden County, New Jersey

New Jersey is well known for having covered incinerator debt payments for its counties in the past, mainly due to the fact that these incinerators were built at the state's direction. All five of New Jersey's waste incinerators ran into financial problems in the 1990s when they did not receive sufficient quantities of waste to operate. The state, which loaned much of the money for the construction of these facilities, had to bail out the incinerators with US$1billion in taxpayer money (taken from the state's 1999 general budget).[32]

In the last decade New Jersey doled out another $509 million to a dozen of these counties to help them cover their incinerator debt. Camden County received about 30% of these funds for its ailing "waste-to-energy" incinerator, which is owned by a subsidiary of the Foster Wheeler company. The Pollution Control Financing Authority of Camden County (PCFACC) owns the land on which the plant operates.

In late 2010 the PCFACC approached state officials again when they did not have enough funds to cover their annual $25 million dollar incinerator bond payment. According to a lawyer for the Authority, the state is in the business of bailing out private bondholders.[33] New Jersey environmental groups have demanded that privately owned incinerators be allowed to compete in an open market without state subsidies, and that if they are unable to remain financially solvent, they be should shut down. State officials have pressed for the authority to restructure the debt, but the PCFACC say they can't because "its credit ratings are junk".

FEDERAL SUBSIDIES AND POLICY SUPPORT FOR WTE INCINERATORS

As widespread momentum for "renewable energy" continues to grow, the WTE industry hopes to capitalize on this momentum by painting themselves as green and renewable. This is arguably the lifeline for an industry plagued with widespread public opposition, high costs, and the uptake of more efficient, competing practices such as recycling and composting. While public opposition to WTE incineration persists, industry recognizes that inclusion of WTE in both the popular political rhetoric and the legal definitions of "renewable energy" is its strongest bet for new support. In addition to shifting the economic field by qualifying such projects for myriad renewable energy subsidies, incinerator proponents recognize that if WTE can gain wide acceptance politically, the regulatory hurdles and permitting processes that follow may become easier for the industry at every level.
While numerous other subsidies and incentives may impact the waste sector, there are a number of programs that many "waste-to-energy" projects are directly eligible for. Many of these were either created, or greatly expanded under the 2009 Stimulus package, or American Recovery and Reinvestment Act (ARRA), which provided $1.64 billion in stimulus funding to the renewables program and $800 million of that to advanced biofuels program (for which WTE incinerator projects potentially qualify).

The following are the most direct, and most substantial federal policies that effectively encourage "waste-to-energy" incinerator projects:

- Renewable Fuel Standards (RFS)
- Federal Renewable Electricity Production Tax Credit (PTC)
- Business Energy Investments Tax Credit (ITC)
- U.S. Department of Treasury - Renewable Energy Grants
- Advanced Manufacturing Tax Credit (MTC)
- Renewable Energy Production Incentive (REPI)
- Energy Efficiency and Conservation Block Grant Program (EECBG)
- Clean Renewable Energy Bonds (CREB's)
- Qualified Energy Conservation Bonds (QECB's)
- U.S. Department of Energy - Loan Guarantee Program
- U.S. Department of Agriculture - Rural Energy for America Program (REAP) Grant
- U.S. Department of Agriculture – Biorefinery Assistance Program

Note: Stacking subsidies is one of the primary financial strategies pursued by expensive, high-risk energy projects seeking to lure local government contracts and hedge their investments against risk.

Renewable Fuel Standards (RFS)

The original Federal Renewable Fuel Standard (RFS1) was created with the Energy Policy Act of 2005, mandating 7.5 billion gallons of renewable fuel (typically ethanol) be blended into gasoline by 2012. The Energy Independence and Security Act of 2007 (EISA) amended this program t (RFS2) to increase the volume of renewable fuel required to be blended into transportation fuel from 9 billion gallons in 2008 to 36 billion gallons by 2022; established new categories of renewable fuel and set separate volume requirements for each one; and required the EPA to apply lifecycle greenhouse gas performance threshold standards to ensure that each category of renewable fuel emits fewer greenhouse gases than the petroleum fuel it replaces. [34]

While none are commercialized, several waste technologies are being developed that could qualify under the RFS2, from landfill methane capture projects that can create pipeline-quality natural gas from biogas, to various biomass technologies and projects. In general, the biogenic portions of MSW and construction waste qualify as a renewable feedstock. Both new thermal conversion (gasification, pyrolysis) and chemical (digestion, fermentation etc) technologies can qualify as well.

In addition to the Federal RFS, at least 9 states also have a state RFS, generally requiring ethanol or "renewable fuel" to be blended with gasoline, or mandating biodiesel production. The mandates of the RFS may be an economic driver of "waste-to-energy" technologies and projects, but in general, specific subsidies come from other federal programs such as the ITC and PTC it replaces.

Federal Renewable Electricity Production Tax Credits (PTC)[35] [36]

The Production Tax Credit (PTC) lowers the federal income taxes of qualifying tax-paying owners of renewable energy projects. The credit is based on the kilowatt-hours (KWh) generated by a qualifying facility, and the definitions (and credit amounts) for various facilities change under Congressional budget cycles. Smaller developers may not have the tax liability to fully take advantage of the PTC, so it is common for larger investors to partner on projects, and receive the bulk of the tax credit in exchange for better investment terms.

The PTC was first enacted with the Energy Policy Act of 1992, and most recently the American Recovery and Reinvestment Act of 2009 created the option for taxpayers to take a federal business energy investment tax credit (ITC) or receive a cash grant from the U.S. Treasury Department in lieu of taking the PTC, which is generally equal to 30% of eligible costs. Projects that receive other federal grants, tax credits, tax-exempt or subsidized energy financing may have a reduced PTC.

The following chart shows the credit amounts for Tier 1 and Tier 2 resources (1.5¢/KWh and .75¢/KWh in 1993 dollars, adjusted for inflation).

Resource Type	2010 Credit Amount
Wind	2.2¢/KWh
Closed-Loop Biomass	2.2¢/KWh
Open-Loop Biomass	1.1¢/KWh
Geothermal Energy	2.2¢/KWh
Landfill Gas Capture	1.1¢/KWh
Municipal Solid Waste	1.1¢/KWh
Qualified Hydroelectric	1.1¢/KWh
Marine and Hydrokinetic (150 kW or larger)	1.1¢/KWh

MSW incineration and Landfill Gas to Energy are both considered Tier 2 technologies, receiving half of the full Production Tax Credit. There is an active push from the industry to define WTE as Tier 1. The duration of the credit is generally 10 years after the date the facility is placed in service, but there are exceptions based on initial date of service.

According to the Energy Recovery Council (an incinerator industry association), the 87 WTE plants in the United States [37] generate 17 billion kilowatt hours of electricity annually. If all of these producers received the PTC, the tax credits would amount to $187,000,000 per year.

Business Energy Investment Tax Credit (ITC):[38]

Under the American Investment and Recovery Act of 2009 (ARRA), the ITC is a credit in lieu of the PTC, which reduces the federal income tax for owners of qualifying projects based on the capital investment of the project. These credits are earned when the equipment is placed into service, and can reduce the upfront costs of renewable energy projects. Project owners cannot claim both the PTC and the ITC.

The ITC credits are equal to 30% of the project expenditures, with maximum credits varying based on the technology used. Estimates are that the ITC costs $285 million annually.

U.S. Department of Treasury Renewable Energy Grants

Under the ARRA qualifying energy projects may elect to receive a Treasury grant instead of the ITC equal to 30% of project capital costs. These grants can only be taken in lieu of the PTC or ITC, not in combination. [39] This program is commonly known as the 1603 Program, and once again, is only applicable to tax-paying entities.

The Treasury's list of awarded projects showed that as of October 2011, $9.1 billion in grants had been awarded, and overwhelmingly for wind projects. It does not appear that any municipal solid waste

incinerators received funding from this program, although new projects are eligible. Three projects awarded a total of $5.3 million were listed as "Trash Facility," and all are biogas (anaerobic digestion) projects in Ohio. 1.5% of the awarded grants went to biomass projects (15 projects totaling $133 million), and 0.4% of the awarded grants went to Landfill Gas projects (19 projects totaling $36 million). It appears all the funded biomass projects were open-loop, not surprising since open-loop projects are only eligible for half the PTC value (1.1¢/KWh), while closed-loop are eligible for the full ITC value.[40]

Advanced Energy Manufacturing Tax Credit (MTC)

Also a program under the 2009 ARRA, the MTC authorizes the Treasury to provide $2.3 billion in tax credits to qualified investments in advanced energy projects, for new, expanded, or re-equipped domestic manufacturing facilities. The MTC provides a 30% credit (similar to the PTC and ITC), but specifically to manufacturing technologies and projects, rather than specific end-use production projects. Applicants will be jointly reviewed by the DOE and the IRS, and be judged on the expected commercial viability, expected job creation, reduction of emissions and pollutants, innovation, and timeline for commercialization. [41]

While the MTC wouldn't necessarily fund an incinerator project directly, it might fund the underlying technology development. The parameters for eligible projects are quite broad, and commercial application of various technologies may have multiple applications (i.e. gasification for multiple feedstocks, potentially including MSW).

Renewable Energy Production Incentive (REPI):[42]

The REPI program was created by the Energy Policy Act of 1992, and amended with the Energy Policy Act of 2005. It is essentially a parallel program to the Production Tax Credit (PTC), but for local, state, and tribal, public utilities, rural electric cooperatives, and native corporations. The structure and credit system of the REPI is similar to the PTC, paying per KWh of production. However, where REPI values fluctuate much more widely, and have caps, the PTCs do not, and therefore are much more valuable.

Qualified technologies include landfill gas, solar, wind, geothermal, biomass, livestock methane, ocean/tidal, anaerobic c digestion, and fuel cells using hydrogen derived from eligible biomass facilities. MSW is not considered qualifying under this program but closed-loop biomass facilities are. REPI is administered by the Department of Energy, and annual funding in 2008 was $4.5 million dollars. Congress did not allocate 2010 funding for REPI.

Energy Efficiency and Conservation Block Grant Program (EECBG)

The DOE also administers the Energy Efficiency and Conservation Block Grant (EECBG) program, providing grants to local governments, tribal governments, states, and U.S. territories to reduce energy use and fossil fuel emissions, and to implement energy efficiency improvements. The ARRA appropriated $3.2 billion for the EECBG Program for fiscal year 2009, but no further funds were allocated for 2010. Activities eligible for funding include landfill gas capture or reduction, and material conservation programs including source reduction and recycling.[43]

Clean Renewable Energy Bonds (CREBs)[44]

Clean renewable energy bonds (CREBs) are used to finance renewable energy projects at a 0% interest rate. In general, the same qualifying technologies for the PTC qualify for CREBs, including landfill gas, biomass, municipal solid waste, and anaerobic digestion. CREBs may be issued by electric cooperatives, government entities (states, cities, counties, territories, Indian tribal governments or any political subdivision thereof), and by certain lenders. The borrowing entity pays only the principal on the bond, and the bondholder receives federal tax credits in lieu of the traditional bond interest.

The Energy Policy Act of 2005 created CREBs as a financing mechanism for public sector renewable energy projects, allocating $800 million. The Tax Relief and Health Care Act of 2006, made available an additional $400 (all "old" CREBs). The Energy Improvement and Extension Act of 2008 allocated $800 million for "new" CREBs, and the American Recovery and Reinvestment Act of 2009 allocated an additional $1.6 billion for new CREBs, for a total new CREB allocation of $2.4 billion. [45]

Qualified Energy Conservation Bonds (QECBs)[46]

QECB's were authorized by the Energy Improvement and Extension Act of 2008, and are a tax credit bond similar to CREBs, but issued by state, local, and tribal governments. While the funds are federal, applicants do not need to go through an approval process from the Treasury, rather the Treasury issues bonds to states based on population, and then states issue them primarily to local governments, and to some private entities.

2008 allocation was $800 million, and the ARRA of 2009 expanded the volume to $3.2 billion. Eligible projects include landfill gas capture, biomass, MSW incineration, and anaerobic digestion.

U.S. Department of Energy (DOE) Loan Guarantee Program

The Energy Policy Act of 2005 authorizes the Department of Energy to issue loan guarantees to eligible projects that "avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases" and "employ new or significantly improved technologies". Lending guidelines accept open- and closed-loop biomass project, municipal solid waste, landfill gas capture, and anaerobic digestion.

The American Recovery and Reinvestment Act of 2009 expanded the loan guarantee program to include $30 billion energy systems, biofuels, and electric power transmission projects. At least $500 million is for "cutting edge biofuels projects", which potentially include many WTE facilities. [47]

In August of 2010, the Taylor Recycling Facility in Montgomery, NY was the recipient of a $100 million loan guarantee. [48] This project will be a gasification facility with a capacity of 500 tons per day of municipal solid waste, 450 tons per day of construction waste, and 100 tons per day of wood waste. It is expected to generate 20 MW of electricity as well as pipeline-ready syngas.[49]

USDA -Rural Energy for America Program (REAP) Grants and Loan Guarantees

As part of the Food, Conservation, and Energy Act of 2008, Congress converted the Federal Renewable Energy Systems and Energy Efficiency Improvements Program, into the Rural Energy for America Program (REAP). REAP is administered by the United States Department of Agriculture (USDA), and primarily provides grants and loan guarantees for energy efficiency improvements and renewable energy systems to agricultural producers and rural small businesses.

Congress has allocated funds in the following amounts per fiscal year (FY): $55 million FY 2009, $60 million FY 2010, and $70 million FY 2011 and FY 2012. This totals $255 million through FY 2012.[50]

Of the total REAP funding available; approximately 88% is dedicated to competitive grants and loan guarantees for energy efficiency improvements and renewable energy systems. These incentives are available to agricultural producers and rural small businesses to purchase renewable energy systems (including systems that may be used to produce and sell electricity) and to make energy efficiency improvements. Funding is also available to conduct relevant feasibility studies, with approximately 2% of total funding being available for these studies. Eligible renewable energy projects include wind, solar, biomass and geothermal; and hydrogen derived from biomass or water using wind, solar or geothermal energy sources. These grants are limited to 25% of a proposed project's cost, and a loan guarantee may not exceed $25 million. The combined amount of a grant and loan guarantee may not exceed 75% of the project's cost. In general, a minimum of 20% of the funds available for these incentives will be dedicated to grants of $20,000 or less. The USDA likely will announce the availability of funding for this component of REAP through a Notice of Funds Availability (NOFA).

The USDA will also make competitive grants to eligible entities to provide assistance to agricultural producers and rural small businesses "to become more energy efficient" and "to use renewable energy technologies and resources." These grants are generally available to state government entities, local governments, tribal governments, land-grant colleges and universities, rural electric cooperatives and public power entities, and other entities, as determined by the USDA. These grants may be used for conducting and promoting energy audits; and for providing recommendations and information related to energy efficiency and renewable energy. Of the total REAP funding available; approximately 9% is dedicated to competitive grants for energy technical assistance.

A proposed biofuels demonstration facility in Florida obtained $75 million in financing backed by the US Department of Agriculture 9003 Biorefinery Assistance program in August 2011. The INEOS Bio facility plans to use yard and household waste to generate energy and ethanol fuel.

Direct Federal Grants through Economic Development Administration

A more direct federal subsidy of $1.8 million was given to a "waste-to-energy" business incubator in the form of a community block grant from the Economic Development Administration of the Department of Commerce. The grant was given in 2010 to the Missouri Center for Waste to Energy, a project of the

State Fair Community College in Sedalia, MO, and private companies including ProEnergy Services and Waste Corp. of Missouri.[51]

DOE Loans, Bureau of Indian Affairs (BIA) Grants and Loan Guarantees

The Bureau of Indian Affairs (BIA), an agency of the U.S. Department of the Interior, has already provided $584,000 to the Oneida Seven Generations Corporation (Oneida) for a pyrolysis gasification project on tribal lands. The U.S. Department of Energy (DOE) is currently evaluating whether to authorize a loan of up to $2 million in Federal funds through Wisconsin's State Energy Program, as well as an additional loan guarantee through BIA of up to $19 million.[52]

HISTORY AND CONTEXT

The WTE incinerator sector and allied industries

The management of municipal waste in the U.S. has historically been shouldered by local governments, with the help of numerous private contractors that collect, transport, sort, bury and burn waste. Over the last few decades this diverse business community has been consolidated, and both vertically and horizontally integrated into a handful of large national waste disposal firms that dominate this sector. As land prices and availability raised the cost of landfills over the years, a large number of cities turned to constructing trash incinerators. The siting of incinerators and hazardous waste landfills in the 1960s led to some of the early environmental justice protests within a broader civil rights movement. Following the creation of the national Clean Air Act, and increasing public awareness of industrial air pollutants, waste incinerators became an iconic symbol for environmental and public health organizing around the country. Between 1982 and 1997, over three hundred new incinerator proposals were stopped by public opposition in the U.S. – from community organizing in environmental justice communities to national toxics campaigns run by groups like Greenpeace. Due to these widespread grassroots efforts, no new waste incinerator has been built in the U.S. since 1997, and hundreds of new incinerator proposals have been rejected or stalled.

With the emergence of climate and energy policies in the U.S. (2005 -2006) the incinerator industry has staged a significant comeback, revisiting many of the communities and government offices they unsuccessfully courted in the past. Traditional mass-burn incinerators form the vanguard of this sector, which now promotes itself as "waste-to-energy" (WTE). Of the 87 WTE incinerators currently operating in the U.S., two companies, Covanta Energy and Wheelebrator (a subsidiary of Waste Management), control over two-thirds of the facilities and over three quarters of the total waste burned. Covanta runs 44 of these incinerators and is trying to establish a global presence through incinerator projects in Canada, China, Mauritius and the EU.

In recent years a host of new, staged incineration technology companies have emerged. Touting themselves as greener technologies, these companies are made up of gasification, pyrolysis and plasma arc vendors [53.] While these capital-intensive thermal conversion technologies have been used in other industry sectors, effort to introduce these into the WTE sector has been largely experimental. **No commercially operational (or viable) waste gasification, pyrolysis or plasma arc incinerators exist in the U.S. today.** A handful of pilot projects using these technologies have been unsuccessful at demonstrating their ability to prevent pollution, reduce waste and produce energy in a cost effective manner.[54]

In addition to existing traditional WTE Incinerators and the new staged incinerator technologies, a number of other waste industries have begun closing ranks with the traditional incinerator facilities, in an effort to qualify for the same subsidies. These include:

- **Landfill gas to energy projects (LFGTE):** these projects are primarily designed to capture methane emissions from landfills. As landfills are one of the leading sources of methane, a greenhouse gas that is 72 times more potent than carbon dioxide, state agencies have prioritized support for these energy projects as a climate mitigation effort. However, zero waste and clean energy advocates have warned that such investments only serve to exacerbate the landfill methane problem, as a large amount of the methane continues to escape in the form of fugitive emissions. These experts suggest that diverting the organic waste content to composting and anaerobic digestion (or biogas) plants would be a more effective prevention.

- **Biomass Incinerators**: over 200 biomass incinerators currently operate in the U.S., burning waste wood, construction debris, railway ties, municipal waste, forest industry waste and industrial agriculture waste in facilities much like waste incinerators. Over 300 new biomass incinerator proposals currently exist, posing similar economic, pollution and public health threats as waste incineration[55]. Biomass industry lobbyists have coupled their efforts with the WTE Incinerator lobby, and these groups often use the terms “biomass” and “WTE” interchangeably.

- **Anaerobic Digestion (biogas)** is widely acknowledged as the most effective and clean production of energy from organic waste streams. However, the development of biogas faces challenges associated with many of the organic waste feedstocks proposed, such as:
    - Sewage sludge that embodies many toxic and hazardous compounds
    - Factory farm waste and industrial agriculture waste – us of which perpetuates a reliance on supply from major unsustainable and harmful industries.

In addition to the waste sector industries, a number of other firms have jumped onto the WTE bandwagon, including venture capital and private equity firms - capital providers that seek particularly high returns; private waste consultants; combustion engineering firms; and, municipal utility cooperatives. This broad array of WTE proponents have begun sharing strategies for securing energy subsidies, leveraging public financing and buffering risk, as described in this 2011 biomass industry workshop:

Discover how well-planned and organized biomass projects can get funded today by leveraging government programs, tax equity and municipal financing to overcome the current dearth of traditional capital. From pre-development capital to project debt financing and equity investment, find out how a biomass project with a realistic capital structure can significantly improve its odds of succeeding.

WTE Incinerator subsidies compared to other forms of electricity production:[56]

Depending on the set of assumptions and parameters used, statistics on subsidies can reflect differing results. The data in this report is largely from the 2008 Energy Information Administration (EIA) study titled "*Federal Financial Interventions and Subsidies in Energy Markets 2007*".[57] Some of the subsidy amounts in this report, particularly those of the nuclear power industry, were identified as being low due to certain assumptions and omissions by the authors of the report. More about the contested figures in this study can be found in the Earth Track report: *EIA Energy Subsidy Estimates – A Review of Assumptions and Omissions, authored by Doug Koplow, March 2010.*

In general, WTE incineration receives the smallest amount of annual federal subsidies compared to other energy production, both on a total aggregate amount, but also on a per-unit basis for energy produced. However, as MSW has only recently been considered a renewable resource, subsidies are expected to increase and the WTE incinerator industry may increasingly be eligible for existing subsidies that they may have not yet accessed. In addition, the growth and maturity of the renewable sector as a whole, pending climate and/or energy legislation, and increasing political trends to reduce or eliminate fossil-fuel subsidies may vastly change this equation in the near future.

Table 2 Federal Subsidies for Electricity Production, 2007

ENERGY TYPE:	FY 2007 Net Generation (billion KWh)	Total Federal Subsidies (million $)	Subsidy per unit of Energy ($/mWh)
Coal	1,946	854	0.44
Natural Gas	919	227	0.25
Nuclear	794	1,267	1.59
Biomass	40	40	0.89
Wind	31	724	23.37
Solar	1	14	24.34
Landfill Gas Capture	6	8	1.37
"Waste-to-Energy"	9	1	0.13

CONCENTRATION OF RISK IN THE WTE INCINERATOR SECTOR

Energy companies have traditionally sought to stack public subsides as a risk management strategy. Over the last decade, hundreds of proposals for waste incineration facilities have been stopped across the country as a result of grassroots organizing and community advocacy. No new commercial incinerator has been constructed since 1997 due to public opposition, which is based on identified health risks, high costs, technological malfunctions, false and misleading claims by incinerator vendors, and the preference for waste reduction practices such as recycling and composting.

The following profiles of inherent risk contribute to the overall *reputational risk* associated with waste incineration. These are the core issues we need to educate our lawmakers on - to ensure that OUR dollars are NOT made available to such high-risk industries. These are also significant deterrents for private financial institutions looking to enter into financing arrangements with WTE incinerator companies.

Financial Risk

Municipal solid waste incinerators are the most expensive form of energy generation in the U.S. The capital costs are double that of coal power plants and over 60% higher than nuclear. Waste incinerator operations and maintenance costs are ten times greater than coal and four times greater than nuclear.[58] Often costing upwards of half a billion dollars to build, many incinerators have also required hundreds of millions of additional spending on upgrades for the latest pollution control technologies. Since waste management is the responsibility of local government, all these costs are eventually borne by the public.

Table 1, Capital Cost Estimates for Electricity Generation Plants for Selected Technologies

Technology/Fuel	Nominal Facility Capacity (kW)	Capital Cost ($/kW)	Fixed O&M ($/kW-yr)	Variable O&M ($/MWh)
Advanced Pulverized Coal	650,000	3,167	35.97	4.25
Advanced Nuclear/Uranium	2,236,000	5,339	88.75	2.04
Waste Incineration	**50,000**	**8,232**	**373.76**	**8.33**
Photovoltaic/Solar	150,000	4,755	16.70	0
Onshore Wind	100,000	2,438	28.07	0

Table from U.S. Energy Information Administration (Department of Energy), Updated Capital Cost Estimates for Electricity Generation Plants, November 2010. http://www.eia.gov/oiaf/beck_plantcosts/pdf/updatedplantcosts.pdf

Incinerators are a risky investment for municipalities. In October 2011, the city of Harrisburg, PA voted to file for bankruptcy due to its outstanding incinerator-related debt of over $300 million. Harrisburg's annual incinerator debt payments are $68 million, larger than the city's entire operating budget.[59] Similarly, Detroit taxpayers have been saddled with over $1.2 billion debt from constructing and upgrading the world's largest waste incinerator.[60] As a result, residents have had to pay high trash disposal fees of over $150 per ton. The city could have saved over $55 million in just one year if it had

never built the incinerator. For a fraction of these costs, investments in recycling, reuse and remanufacturing would create significantly more business and employment opportunities.[61]

Public Health Risk

Even the most technologically advanced incinerators release thousands of pollutants that contaminate our air, soil and water. Many of these pollutants enter the food supply and concentrate up through the food chain. Incinerator workers and people living near incinerators are particularly at high risk of exposure to dioxin and other contaminants.[62]

In newer incinerators, air pollution control devices such as air filters capture and concentrate some of the pollutants; but they do not eliminate them. Modern pollution control devices such as baghouse filters do not prevent the escape of hazardous emissions such as ultra-fine particles.[63] Ultra-fines, or nano-particles, are too small to be effectively captured, and can penetrate deep into the lungs; yet they are currently not regulated or monitored by the U.S. EPA. It is estimated that airborne particulates cause the deaths of over 2 million people worldwide each year.[64] In the U.S., communities of color, low-income communities, and Indigenous Peoples' communities are exposed to a disproportionate burden of such toxins.[65]

Climate Risk

Due to the low calorific (energy) value of municipal waste, WTE incineration is the most carbon-intensive form of energy generation, producing more CO_2 (2988 lbs/MWh) per unit of electricity than coal power (2249 lbs/MWh).[66] Contrary to industry claims that their plants serve to reduce significant emissions reductions from landfills and fossil fuels, WTE incinerators are major climate polluters.

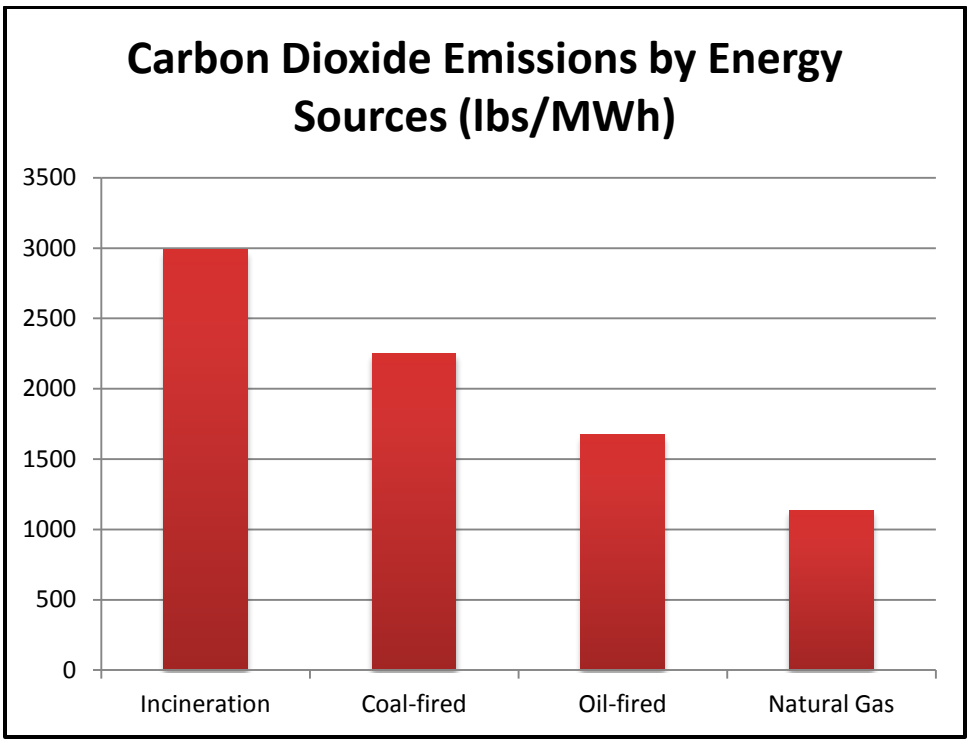
However, the greatest global warming impact of incinerators and landfills is the fact that these technologies destroy valuable materials, which could otherwise be recycled or composted. According to the U.S. EPA, WTE incinerators and landfills contribute far higher levels of greenhouse gas emissions and throughout their lifecycles than source reduction, reuse and recycling of the same materials.[67]

Incineration also drives a climate changing cycle of new resources pulled out of the earth, processed in factories, shipped around the world, and then destroyed in incinerators and landfills. A 2009 study by the EPA concluded that up to 42% of U.S. GHG emissions are generated in the production, use and discard of goods and materials, and this could be significantly reduced through recycling and composting.[68]

In addition, recycling is one of the most cost-effective strategies that can be pursued to combat climate change: Avoiding one ton of CO_2 emissions through recycling costs 30% less than doing so through energy efficiency, and 90% less than wind power.[69]

Implementing a comprehensive national waste reduction, reuse, recycling and composting program would cut greenhouse gas (GHG) emissions by the equivalent of taking half the nation's cars off the road, or shutting down one-fifth of the nation's coal-fired power plants.[70]

Table from U.S. EPA data: Greenhouse Gas Emissions from Incineration and Coal Plants



U.S. EPA, http://www.epa.gov/cleanenergy/energy-and-you/affect/air-emissions.html

Technology Risk I: Performance & Liability

Even with inadequate regulations and monitoring, waste incinerators are frequently found to violate pollution control limits. Incinerator operators in the U.S. are currently paying millions of dollars in fines and court settlements for breaches of emissions laws. In May 2011, Wheelabrator (a subsidiary of Waste Management) agreed to pay $7.5 million to three Massachusetts municipalities to settle an environmental lawsuit from the state Attorney General. The settlement was for environmental violations and defrauding communities that paid for "safe waste disposal".[71]

Covanta has had multiple emissions settlements in recent years. In 2010, Covanta shut down an incinerator in Connecticut after the state discovered excessive dioxin emissions, which resulted in a July 2011 settlement of $400,000 with the Connecticut Attorney General. In 2010, Covanta settled a New Jersey lawsuit with the Ironbound Community Corporation and Greenfaith for hundreds of Clean Air Act

violations. In November 2009, Covanta settled for $355,000 with the Connecticut Attorney General[72] for excessive dioxins emissions at an incinerator.

These problems are not limited to the U.S. In December 2010, a waste incinerator in Crymlyn Burrows in Wales, U.K., was shut down for repeatedly breaching dioxin emission limits. In Iceland, incinerators have been identified as the source of widespread contamination of meat and dairy products.

Gasification, pyrolysis, and plasma incinerators have a dismal track record plagued by malfunctions, explosions, and shutdowns. The Thermoselect gasification incinerator that was located in Karlsruhe, Germany – one of the largest facilities of the type in the world – shut down permanently in 2004 after years of operations problems and financial losses totaling over 400 million Euros.

Technology Risk II: Energy Generation

Due to the low calorific value of waste, *incinerators are only able to capture small amounts of energy* while destroying large amounts of reusable materials. This fundamental inefficiency is what makes incinerators the most expensive and carbon-intensive source of electricity. While older incinerators generate electricity at very low efficiency rates of 19-27%, a 2004 UK study[73] found that conversion efficiencies of new incineration technologies are even lower.

For example, an entire year after operations commenced in 2009, a new "waste to energy" incinerator in Dumfries, Scotland had yet to produce energy to the national grid.[74] Similarly, in Utashanai, Japan, plasma arc company Alter NRG acknowledged that the plasma arc incinerator has been able to generate only a "nominal" amount of energy.[75] This was also the case in 2010 at Plasco's pilot plasma arc facility in Ottawa Canada, where the incinerator was only able to burn one third of its built capacity.[76]

Conversely, zero waste practices such as recycling and composting save three to five times the amount of energy produced by waste incineration.[77] When taken together, the amount of energy wasted in the U.S. by not recycling aluminum and steel cans, paper, printed materials, glass, and plastic is equal to the annual output of 15 medium-sized power plants.[78]

Facility Siting Risk

Since 1997, no new commercial-scale WTE incinerators have been built in the U.S. largely due to community organizing efforts that have created broad public opposition amongst local stakeholders. To date, no commercial gasification, pyrolysis, or plasma incinerators handling municipal solid waste are in operation in the United States. In recent years, hundreds of WTE Incinerator proposals for both mass burn and staged incinerators have been killed or stalled in over a dozen states and jurisdictions, including Minnesota, California, Rhode Island, Indiana, New York, Massachusetts, Georgia, North Carolina, South Carolina, Florida, Illinois, Washington, Wisconsin, Maryland, Vermont, Pennsylvania, and the U.S. Virgin Islands.[79]

Legal advisors to the WTE industry warn their clients that the biggest barrier to permitting and finding a site for a WTE incinerator project is the presence of local environmental justice (EJ) groups that are able to organize community opposition to such projects. Community groups that have stopped these

industry proposals in the past are usually willing to do so again, despite company schemes to return under a different brand name, and with revised schematics showing "new and improved" technologies.

WTE INCINERATION AND DEFINITIONS OF RENEWABLE ENERGY

Despite industry public relations campaigns to rebrand incineration as a renewable energy, the contents of municipal solid waste are not renewable. Additionally, the combustion technologies used to burn waste for energy do not constitute a clean, safe or sustainable practice. MSW contains plastics derived from fossil fuels, as well as metals, glass and other non-organic compounds. MSW also contains food waste, yard waste, and paper that are from biomass resources. There is growing debate about the impact of biogenic carbon emissions, and new studies indicate that biogenic carbon emissions are not carbon neutral, as described on page (See text box below for more on biogenic and fossil emissions). The Intergovernmental Panel on Climate Change, U.S. federal policies and agencies, and state policies and agencies greatly differ on whether energy from waste incineration should be considered renewable or not. This classification is one of the most important decisions for WTE projects, determining if incinerators are eligible for incentives and subsidies, and changing the popular and political discourse around them. There is no clear policy consensus on how to classify WTE projects. If incineration gains broad recognition as renewable energy, the incinerator industry will greatly benefit from a political and public relations standpoint, as well as gaining access to existing subsidies and spawning new ones.

- ***Intergovernmental Panel on Climate Change (IPCC):*** While the IPCC is more concerned with overall human-induced (or anthropogenic) global warming emissions rather than specific fuel sources, their classification of waste incineration is relevant. The IPCC is clear that incinerating biomass materials cannot automatically be considered carbon neutral - recommending that incinerators producing energy report both fossil and biogenic emissions. As illustrated in recent policy reviews,[80] while the IPCC acknowledges that there are differences between emissions from natural biomass processes and smokestack (or tailpipe) emissions, they also fail to provide guidance on life-cycle analyses and equivalent emissions reductions measures across all industry sectors. The consequences of enacting climate legislation without such guidance results in disproportionate financial incentives for companies to switch from fossil fuels to biomass. While biogenic incinerator emissions are undercounted, WTE facilities generally claim avoided emissions for offsetting a fossil fuel source. However, due to the anaerobic conditions in human-created landfills, even the biogenic portions of methane released are considered anthropogenic emissions.[81]

- ***Environmental Protection Agency (EPA):*** Following a court challenge by public interest groups, the U.S. EPA recently removed a statement from its website that supported biogenic emissions being carbon neutral.[82] For emissions, the EPA generally follows the EIA definition (below), and has a hierarchy for suggested waste management that prioritizes source reduction first, recycling and composting second and disposal in landfills or waste combustors (incinerators) last.[83] From

conversations with EPA officials, there is an ongoing internal debate over how to classify and/or support MSW "waste to energy" projects.[84]

- ***Energy Policy Act of 2005:*** Energy from MSW is explicitly defined as renewable energy under Section 203, and this general definition has held for most other related federal policies (such as the 2009 American Reinvestment and Recovery Act – ARRA). Syngas derived from the biodegradation of MSW (i.e. Landfill Gas) is considered biomass under the BioEnergy program. And under the Renewable Fuel Program, fuels created from MSW are included.[85]

- ***Energy Information Administration***: Historically the EIA considered all waste combustion as renewable, but facing criticism in 2007, it reexamined this policy. Deciding that sufficient data existed to accurately estimate biogenic and non-biogenic portions of MSW at the national level was possible, the EIA now considers only the biogenic portion of MSW as renewable. This definition is meant only for their own data collection and assessment, and does not preclude other agencies, policies, or states from adopting different definitions. As of 2005, the EIA considers 56% of the national MSW on a BTU/ton basis to be renewable, and that share has decreased steadily since 1989 – largely attributed to increased paper recycling rates.[86]

Fatal Flaws in Counting Biogenic Emissions as Carbon Neutral

Industrial carbon dioxide (CO_2) pollution is often classified in two categories: "biogenic" emissions and "fossil" emissions. Biogenic emissions refer to CO_2, which results from the burning of biomass, including trees, plants, peat, wood, paper, food waste and other organic materials. Fossil emissions result from the burning of fossil fuels such as oil, coal and gas as well as fossil fuel products such as plastic.

The incinerator industry claims that industrial biogenic emissions should not be regulated in the same way as fossil CO_2 emissions because biogenic emissions are part of "natural carbon cycles" that get sequestered through forest and agricultural ecosystems. They refer to the Intergovernmental Panel on Climate Change (IPCC) accounting protocols, that require biogenic emissions to be tallied in land-use change sectors (logging, agriculture etc), to avoid being "double counted" when biomass is burned for energy. However, such claims embody seven flawed assumptions that threaten atmospheric carbon tipping points and the earth's ability to store carbon.

1. **Accepting a climate accounting error that precludes scientific guidance for policy regimes.** The IPCC fails to provide guidance on life-cycle analyses and equivalent emissions reductions measures across all industry sectors. The consequences of enacting climate legislation without such guidance results in increased financial incentives for companies to switch from fossil fuels to biomass. [1]
2. **Assuming that all biogenic emissions are equal.** Biogenic emissions concentrate in the atmosphere just like fossil emissions, where they remain for decades. Recent studies[2] have shown that rates of natural carbon capture vary greatly depending on biomass type. For example, it could take over a hundred years for a U.S. forest to recapture all the carbon that is produced from burning its timber, as opposed to fast growing crops.
3. **Assuming biomass emissions are "carbon neutral" and cleaner than fossil emissions.** Due to its low energy value, burning biomass produces vastly more smokestack CO_2 per unit of electricity than fossil fuels. Replacing fossil fuels with biomass could actually increase smokestack emissions by up to 50%. This number goes up when factoring in life cycle emissions from harvesting, hauling, manufacturing and waste.
4. **Assuming the same technologies become renewable by burning biomass.** Combustion technologies do not become safe, healthy, or renewable by simply changing fuel feedstock. Burning coal, oil, wood or waste all release emissions that disrupt the climate; once in the atmosphere, biogenic CO_2 behaves identically to fossil CO_2. More important, upgrading the same burn technologies creates barriers for real renewable energy such as wind and solar, as well as for recycling.
5. **Assuming that markets can safely accommodate biomass energy demand.** Regulating and capping fossil emissions while providing policy support for biomass energy has caused a global crisis in food security [3] and land-use conversion[4]. International agencies like UNCTAD, FAO and the World Bank have started to acknowledge the harmful market distortions caused by biomass energy subsidies.[5]
6. **Assuming there are enough natural resources to sustain biomass energy.** To meet current energy demands for one year, the U.S. would have to burn all the trees in its forests.[6] Even the most efficient biomass

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feedstocks require a massive conversion of lands. For example, to supply the San Francisco Bay region's fuel needs with switchgrass ethanol, one would need to convert all the farmlands in California from food to energy production.[7] The 400 biomass incinerators being proposed in the U.S. would run out of domestic feedstocks long before oil and gas supplies.

7. **Assuming that biomass energy has no added impact on human health and the environment.** Subsidizing biomass not only threatens forest ecosystems and food security, a growing number of medical associations point to health risks from various types of biomass[8], i.e. chemically treated wood and sewage sludge. Even the latest pollution control technologies fail to prevent some of the most harmful air emissions from biomass combustion: ultra-fine particulate matter, responsible for over 2 million deaths each year according to the WHO.[9]

Despite these facts, U.S. energy policy has focused much more on the reduction of fossil CO_2 and continues to give biogenic CO_2 a free pass. Many policy advocates and policymakers are unaware of the issue of biogenic carbon accounting, and fail to understand the critical implications of establishing what may seem to them like a minor loophole for biogenic carbon.

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CONCLUSION

How should we invest in our future?

As a country, what decisions should we make about how we invest taxpayer dollars, how we wield market incentives like renewable portfolio standards? Should these decisions be an outcome of which companies have the biggest public relations budgets? Or should they be based on how these investments influence our economy, global energy security, climate change and pollution?

Investing taxpayer money in a regressive industry like incineration means that as a country we are holding up a lose-lose-lose outcome for energy, the climate, and the economy. As a country still in the midst of an economic downturn with over 14 million people unemployed, it in unconscionable to waste taxpayer dollars after a technology that represents both the most expensive electricity generation and waste management options, and pass over an industry that has strong growth potential.

The waste industry's green-washing of its sparse energy potential conceals the reality that incineration depends on continued levels of natural resource depletion to feed a throwaway economy. Wasting undermines zero waste practices such as recycling and composting, which close the loop on materials efficiency and conserve energy spent on resource extraction and processing. New EPA analysis shows that the lifecycle of stuff—extraction, production, and disposal—contributes to 42% of U.S. greenhouse gas emissions. Recycling and composting are critical ways to lighten the ecological footprint of industrial society, while enhancing natural and agricultural resources. In short, recycling provides energy, climate and financial savings from the beginning to the end of the supply chain.

According to the Institute for Local Self Reliance, recycling creates more than 10 times as many jobs as disposing the same amount of stuff. Only 33% of municipal waste is currently recycled or composted, and the potential for industry and job growth is enormous. Recycling jobs can be good, quality local jobs that support families, and need to have strong safeguards to ensure a safe and resilient working environment for workers and host communities.

Alongside efforts to promote zero waste policies and practices, create stronger community and worker safe-guards, and apply new economic planning tools such as *full cost accounting* and *life cycle analysis*, we need to protect the public interest by shifting public subsidies from waste burning towards community-based investments in a resource recovery economy.

Our hope is that this report will help communities hold decision-makers accountable in stopping the flow of these perverse subsidies to dirty energy such as WTE Incineration, so that the public can invest in equitable, just and clean energy and zero waste jobs.

As a nation, it's time we seriously invested in developing a strong zero waste economy - one that will conserve energy and natural resources, reduce greenhouse gas emissions and toxic pollution, and create family supporting jobs through the highest end use of materials and clean, non-combustion energy.

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