LEARNING NOT TO BURN

A Primer for Citizens on Alternatives to Burning Hazardous Waste

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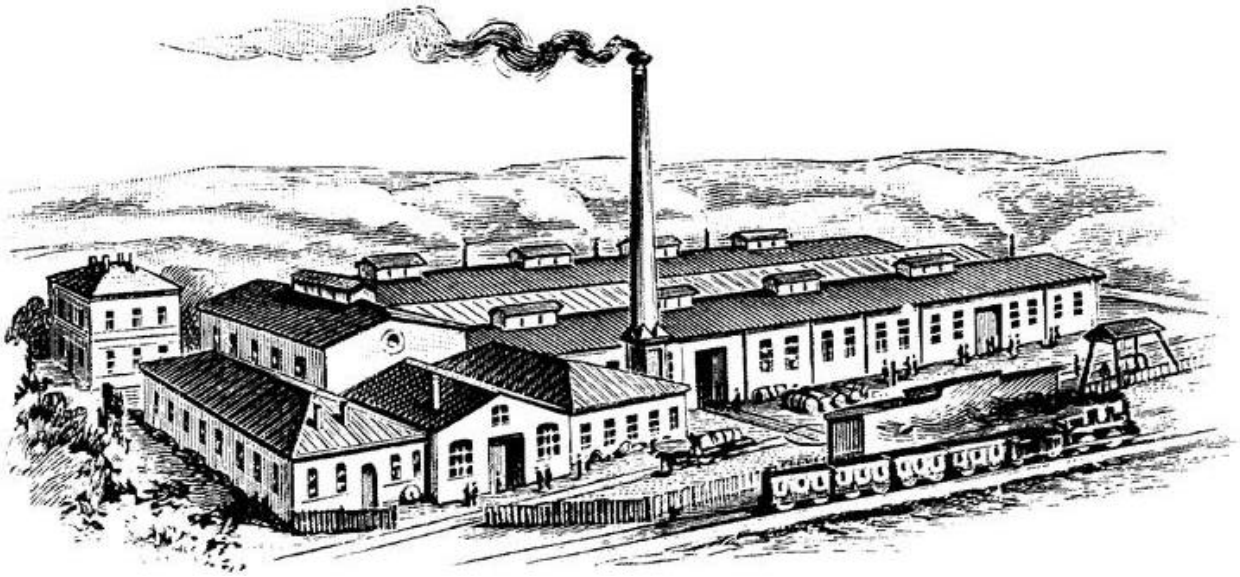

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Executive Summary

Incineration has long been criticized internationally by scientific experts and organizations as a technology that releases toxic chemicals including dioxins, furans, and heavy metals into the environment, and puts our families' health and well being at risk. Despite these facts there are thousands of incinerators of many kinds all over the world that are used to burn wastes. In the U.S., more than 100 incinerators, cement kilns, aggregate kilns and other industrial furnaces burn the nation's hazardous wastes. Many of these facilities exist in communities of color, low-income communities, and on tribal land. Our communities are experiencing a public health crisis from decades of exposure to toxic wastes, the impacts of which will be passed along to future generations.

There are two main components to a comprehensive solution to our hazardous waste dilemma: 1) Clean production and Zero waste, a holistic approach to product manufacturing in a manner that neither uses nor releases hazardous wastes; and 2) Safe, non-incineration technologies for disposal of existing hazardous wastes and persistent organic pollutants.

This primer is intended to fill a gap in information on non-incineration technologies for hazardous waste disposal, and present strategies that can be used in parallel with clean production and zero waste efforts to bring about sustainable solutions and environmental justice.

Increasingly, there are more political and economic incentives for government and industry to move toward safer, cleaner alternatives to hazardous waste incineration. The Stockholm Convention on Persistent Organic Pollutants and other international agreements call for phasing out and ultimately eliminating releases of toxics such as PCBs, dioxins and pesticides. Communities suffering from poor health due to toxic contamination have worked successfully with regional and national environmental justice, conservation, public health and right-to-know organizations to shut down and prevent many incinerators, leaving the incinerator industry itself looking for alternatives to its dying approach to waste disposal.

Fortunately, many non-incineration hazardous waste disposal technologies exist which offer benefits over incineration, including:

- Containment of by-products;
- More complete analysis of by-products;
- Low temperatures, which are inherently safer for workers;
- Prevention of uncontrolled release of hazardous wastes, even when problems occur; and
- High destruction efficiency.

Some of the available technologies that meet this criteria are chemical neutralization, supercritical water oxidation, gas phase chemical reduction, electrochemical oxidation,

and biological treatment methods. Other technologies are being developed at the laboratory and pilot scale, and may also prove successful for hazardous waste destruction in the near future.

When assessing non-incineration technology options, criteria such as worker safety, vendor accountability and technology costs can help determine the best disposal technology for a particular waste.

To illustrate the potential for implementation of non-incineration technologies, this report looks at the experiences of the Chemical Weapons Working Group (CWWG) and the movement for safe chemical weapons destruction, and the Citizens' Environmental Coalition (CEC) and Kandid Coalition's campaign to stop the burning of hazardous wastes generated by Eastman Kodak at their Rochester, New York headquarters.

The CWWG's ten-year effort to force the U.S. Army to abandon chemical weapons incinerators in favor of safer destruction methods has resulted in a federal technology demonstration program, the Assembled Chemical Weapons Assessment (ACWA), and other non-incineration technology assessments. Non-incineration technologies are now scheduled for implementation at several chemical weapons stockpile sites in the U.S. and according to the U.S. Environmental Protection Agency (EPA), could also be applied to hazardous wastes regulated by the U.S. Resource Conservation and Recovery Act (RCRA).

Eastman Kodak, a company operating two hazardous waste incinerators in Rochester, New York burns over 70 million pounds of chemicals a year, releasing alarming amounts of toxic chemicals into the environment. Upon evaluating the RCRA codes for hazardous wastes entering Kodak's incinerators, CEC found that many of these wastes could be destroyed and treated with non-incineration methods such as Eco Logic's Gas Phase Chemical Reduction Technology, AEA Silver II Technology, CerOx Process, and Supercritical Water Oxidation Technology. CEC and the Kandid Coalition are pushing Kodak to make a commitment to clean production practices, and in the meantime consider use of non-incineration alternative technologies to treat Kodak's hazardous waste streams.

Introduction

For decades, our government and regulatory agencies have subscribed to the notion that incineration is the only way to solve our hazardous waste problems. It is still widely believed that incinerators, if operated properly, are a safe and effective way to destroy hazardous wastes. As a result, there are more than 100 commercial incinerators, cement kilns, boilers and aggregate kilns burning hazardous wastes as regulated by the U.S. Resource Conservation and Recovery Act (RCRA), polychlorinated biphynels (PCBs) and other toxics. The Department of Defense and Department of Energy also have numerous incinerators permitted to burn obsolete weapons, military and nuclear wastes. Many of these facilities are located in or near communities of color, low-income communities and on tribal lands.

Incineration is a dangerous and inefficient way to deal with our hazardous waste problems, fraught with environmental injustice. Depending on the type of waste being burned, incinerator smokestack emissions include heavy metals, PCBs and products of incomplete combustion (PICs), many of which have never been identified (EPA, 1999). Incineration also produces new chemicals, including dioxins and furans, during and subsequent to combustion. In addition to the harmful air emissions, incinerators produce ash laced with toxic chemicals which must be further treated or land filled. Clearly, we need safer alternatives to incineration.

At the People's Summit on Dioxin in August 2000, convened by the Center for Health, Environment and Justice and Greenaction, the idea for this primer arose. During a workshop on hazardous waste incineration, grassroots activists and technical experts agreed that 1) a clear understanding of alternative technologies to incineration was lacking; and 2) the advances made in finding alternatives to incineration for obsolete chemical weapons could be used as a model for securing non-incineration technologies, along with existing models for clean production and zero waste, for disposal of industrial hazardous wastes. We noted the informational and strategic gap in the grassroots movement regarding safer disposal technologies.

This primer seeks to fill that gap. It is intended as a tool for grassroots organizations and community members fighting incinerators in their search for a wider range of options to hazardous waste incineration. At the same time, it is intended to support a comprehensive solution to our waste dilemma that disposal technology alone cannot achieve.

In her book Making Better Environmental Decisions, Dr. Mary O'Brien poses the scenario of a woman poised to cross a river. Engineers, public health experts and statisticians all tell the woman she could probably cross the river on foot with acceptable risks to her health. Despite the assurances from the experts, the woman consistently refuses to cross the river on foot; instead pointing to a bridge a short distance upstream.

We don't have to accept producing and burning hazardous wastes, we have to build the bridge that will lead us to a world where we can live free from the threat of exposures to toxic chemicals. What does that bridge look like? What's it made of? How can we work together to build a bridge that is strong and sustainable?

We will only be truly successful in protecting ourselves from hazardous wastes when we have stopped the government and industry from generating these wastes in the first place. But for stockpiled military and nuclear wastes, and wastes like PCBs which are no longer being produced, non-incineration technologies have served as a safer end-of-pipe alternative to incineration. By using safer hazardous waste disposal technologies as an interim step to, or in parallel with, efforts toward clean production and zero waste, we can help bring about environmental justice and a clean environment for ourselves and for future generations.

Mounting A Grassroots Strategy

Because no hazardous waste facility is truly benign, fighting a hazardous waste incinerator, boiler or cement kiln is part of a much larger struggle -- to end the production of hazardous waste. That's the vision of Clean Production, which calls for design practices that phase out the use of dangerous substances in our products and production processes as a means to reduce and ultimately eliminate our hazardous waste streams.

In the meantime, in particular for stockpiles of hazardous and military wastes, it is important to know about non-incineration technologies. It is too late to prevent existing hazardous wastes, so some technology will have to be put in place to get rid of them. The non-incineration technologies are not perfect, but are better and safer than incineration. This section provides some strategy ideas for how to advocate for a safer technology for disposal of hazardous wastes.

Incinerator activists are often very good at articulating what we don't want. We don't want our kids exposed to toxics. We don't want contaminated food. Saying "no" to an incinerator -- be it an existing or proposed facility -- is key. However saying "no" is only half the battle. Creating a climate in which community members can work cooperatively for a safer destruction technology takes a lot of work. It requires that organizers develop the capacity to make elected officials, industry representatives and regulators resist decades of inertia toward incineration and instead say "yes" to a safer, cleaner disposal method.

A. Exposing the failures of incineration

The first step in the search for safer alternatives to incineration is to show where incineration fails to protect public health. Here are a few ways to document these problems.

1. **Compare incinerator emissions with regulatory limits set by federal, state and local government.** This could entail obtaining documents such as:

- The facility's various operating and air permits, including the facility's Maximum Achievable Control Technology (MACT) and Title V (Clean Air Act) permits;
- Test results and reports from any trial burns or stack emissions tests;
- Correspondence between state and federal environmental and health agencies and the company operating the facility;

- Inspection, monitoring and air sampling reports;
- Permit violations or complaints, enforcement actions, or fines;
- Photographs of the facility; and
- Risk assessments for the emissions.

An efficient way to collect this information is to have the appropriate files mailed to you or schedule an appointment at the regional office of the agency to review these files to see what information will be most helpful. You may need to submit a written request under the federal Freedom of Information Act (FOIA), or your state's open records act to either receive copies of these materials in the mail or set up a time to review the appropriate files.

2. **Pull information from existing reports showing the link between exposure to hazardous chemicals and poor health.** From national activist groups to the National Research Council; from the Environmental Protection Agency to the United Nations Environmental Programme, numerous public health, scientific and engineering professionals, and government agencies have documented that people exposed to hazardous chemicals -- including incinerator emissions -- are at higher risk of illnesses. Communities are more likely to be impacted by toxics if they are poor, non-white, and lack political power (UCC, 1987; Executive Order 12898, 1994). But the reality is that since many persistent toxic chemicals travel throughout the environment and build up in the food chain, we are *all* exposed to hazardous chemicals.

3. **Draw on the experiences and wisdom of your community.** A government risk assessment on incineration emissions may show that a hazardous waste incinerator will operate within regulatory guidelines, and therefore poses acceptable risks to public health. But you may know better. You may know the experiences of people suffering from chronic illnesses, tribal elders who see the effects of toxic chemicals on fish and wildlife, or parents of children with birth defects. This knowledge leads to a conclusion different than that of the government or regulators. It is important to talk to the people that work at the facility or the people that live in the neighborhoods surrounding it. For you, there may be no level of "acceptable" risk and its time to look at the alternatives.

B. Identify the solutions

Following are two components of a comprehensive campaign for alternatives to incineration.

1. **Clean Production and Zero Waste.** These two concepts encompass the way in which material goods are designed, produced, sold, delivered, purchased, used and reused, with the goal of a system in which all materials are cycled back for productive use and no hazardous materials are used or produced (McPherson, 2002; Costner, 2001; GRRN, 2002). Clean Production and Zero Waste should therefore be a collective goal of everyone working to stop exposures to toxic chemicals. Although this report does not delve into clean production or zero waste strategies, they are of equal importance. Please see the resource section for

organizations that can provide information, campaign models and strategy ideas on clean production and zero waste.

2. **Safe alternatives to incineration.** We need to get rid of the hazardous wastes we already have by using safe technologies as a parallel or interim approach to clean production and zero waste.

   In the U.S., the search for safer technologies begins by knowing exactly what kind of waste needs to be destroyed. This could mean looking up the hazardous waste codes as defined by the Resource Conservation and Recovery Act (RCRA). Waste stream information is typically compiled by state environmental regulatory agencies, based on disclosures from the company that is either generating or accepting the hazardous wastes. For hazardous military wastes, the information could also be obtained by a local military installation. The next step is matching the wastes to be disposed with technologies that can safely treat that waste while preventing release of toxics to the greatest extent possible. Later sections in this report discuss specific ways in which to identify and evaluate these technologies.

   When possible, use documents and reports generated on alternatives to incineration by regulatory agencies themselves to bolster your arguments. Some resources within the U.S. are the Environmental Protection Agency's Technology Innovation Office, which tracks various technology options for treatment of all kinds of waste streams and the Interstate Technology and Regulatory Council (ITRC). ITRC is a group of state environmental regulators who review emerging environmental technologies and assess the degrees to which various technologies can be permitted. Government advisory committees such as the General Accounting Office and the National Academy of Sciences/National Research Council have also dedicated a lot of time and ink to technology reviews.

   Many other countries and international organizations are also promoting and using non-incineration technologies for hazardous wastes and other stockpiled wastes. For example, the United Nations Environmental Programme and the United Nations Industrial Development Organization are sponsoring a project to identify and demonstrate alternatives to incineration for disposal of PCBs in the Philippines and Slovenia. Reports on their experiences and technology recommendations can bring credibility to local incinerator fights.

   Documents and technology reviews from organizations and agencies such as those mentioned above are readily available on the internet. Check out this report's reference section for more information.

C. Organize To Win!

1. Defining Your Goals

If you are looking for alternatives to incineration of a fixed amount of waste, for example a stockpile of pesticides, PCB contaminated waste or military waste, securing a clean disposal technology may be your end goal. For an existing incinerator burning hazardous wastes generated on-site, or a commercial incinerator or kiln burning wastes shipped from other locations, getting an alternative technology should, at best, be viewed as an interim step to a much larger goal of clean production.

Note that a successful campaign is one in which the goals are developed and shared by a diverse group of people, committed to respecting cultural differences. Making an early commitment to address racism and economic hierarchy head on brings greater unity and understanding...and it's simply the right thing to do. There are many groups and individuals that help build the capacity and effectiveness of organizations by providing training and guidance on dismantling racism and other forms of oppression.

2. Resources and Allies

What resources can you and your group bring to the campaign? Resources include money but more importantly, the time and energy of people committed to positive change. Assess the number of people who can be relied upon to help carry out the work. Take inventory of other organizations and constituents with similar principles. The list may include: "traditional" allies working on social and environmental justice issues; local business owners; farmers; educators; workers and labor unions; religious and spiritual leaders and tribal and indigenous peoples organizations. Don't forget some more obvious allies: the individuals and organizations all over the world who are engaged in the same struggles as you. The resource section of this report lists places to look for help and support when you need it.

Also assess the people, organizations, or businesses that could actively organize against your campaign, and think about ways in which they could be allies. Take workers, for example. If you are trying to shut down an incinerator, plant workers may perceive your work as a threat to their jobs. But workers, on the front-lines of hazardous waste handling and disposal, can be tremendous resources (providing valuable information on safety and compliance issues) and allies in creating safe jobs

through clean technology and clean production efforts: a win-win situation for any community.

3. Identify your targets

Who has the power to give you what you want? Who makes the decisions and effects change? It may be local or regional elected officials. It may be local business or commerce leaders. Targeting individuals such as a policy maker or company leader may be more effective than targeting an entire company or Board of Trustees. Few individuals can stand the heat of being singled out, especially policy makers.

What has motivated these people to support incineration? In some cases, decision-makers may not realize that safer disposal options exist and they may be just as willing to support safer alternatives. Conducting an in-depth analysis will help you put energy where you are most likely to get tangible results.

4. Develop action steps

Turning goals and principles into distinct action steps can be a challenge, but those actions will bring about change. Here are some basic action steps to consider in promoting alternatives to incineration. Remember to keep a positive message. Give community members something to say "yes" to!

- Use / modify / develop easy-to-understand materials on technology options. Distribute a clear campaign goal statement along with clean production and safe technology information by going door to door, organizing house meetings and visits, and if you have the resources, developing a newsletter to keep people informed. These materials could include information helping consumers understand the importance of purchasing non-toxic products as a means to reduce hazardous waste streams. Be sure to translate materials into other non-English languages spoken in your community.
- Take your message to organizations and civic groups -- don't expect them to come to you for information. Work to bring these organizations into your campaign to form a coalition. Be willing to talk about the benefits of safe hazardous waste disposal as it relates to their interests: clean food supply; positive business climate; healthy kids. Economics might not be your primary reason for fighting an incinerator, but that may be the case for others.
- Request a meeting with your target.
- Organize letter-writing campaigns with a clear message. If you are asking someone to take action, be specific in your request.
- Turn out large numbers of people at public hearings and public events your target attends such as corporate annual meetings, fundraising events, and meetings with elected officials.
- Organize a media strategy including events such as press conferences and street theater; distribution of press releases and story ideas to local mainstream media, bilingual radio, TV and print media, tribal radio stations and trade publications (like a

Chamber of Commerce or Board of Realtors newsletter). Generating OpEds and letters to the editor is also a good way to get your message out.

- Propose a local or statewide resolution supporting clean production and safe technology principles.
- Organize a day for updating local, state and federal elected officials on the issue. Remember to thank elected officials for their time, even if they don't do what you'd like and follow-up frequently with their staff.

D. Using Dialogue to Turn Opponents Into Allies

Some grassroots groups have advanced their work for safer destruction technologies by securing a dialogue process with representatives from industry, government, activist groups, and other citizens from affected communities. For other groups, the experience has not been good at all. Getting people from different viewpoints to agree on anything is no small task. But a dialogue process based in consensus, open access to information and shared decision-making can result in a whole new set of allies for cleaner alternatives to incineration.

Take environmental regulators. Notorious for rubber-stamping polluting facilities, state and federal environmental regulators are often seen to be in collusion with industry and the military. After decades of granting permits for incinerators, regulators haven't had much incentive for investigating alternative technologies. But given the growing awareness of toxicity from incinerator emissions and the resulting tighter regulations on air emissions, cleaner, publicly acceptable technologies could actually make an environmental regulator's job much easier. In any case, environmental regulators need proof that an alternative to incineration will work, if they are going to give it a permit to operate.

When decision-makers and stakeholders are all presented with the same technical information on the technologies, and can together look at other situations where alternatives to incineration worked, there may be a higher level of commitment on behalf of regulators to support a similar project. At the very least, they can no longer deny that the alternatives exist.

This dialogue could come about formally or informally. The Chemical Weapons Working Group coalition has had a largely positive experience with the Assembled Chemical Weapons Assessment Dialogue, which included third-party facilitation, consensus decision-making, and participation by affected community members and high-level regulators and government officials. However, other groups have had troubling experiences with the formal dialogue process when working with community groups negotiating good neighbor agreements with industrial facilities.

When considering whether or not to propose a formal dialogue process on alternatives to incineration, it is crucial to set your ground rules for involvement, such as: diversity among participants; meeting times which fit with citizens' schedules; equal and open access to information; and independent facilitation. Reserve your right to back out if other dialogue members refuse to play fair.

Informal dialogue with decision makers -- including state and EPA regulators, tribal officials, etc. -- can simply mean getting them to agree to communicate consistently and frequently with representatives from your organization. Technology vendors are often happy to spend their own money to provide information directly to decision makers, thereby giving the dialogue more credibility. (Just be careful not to align yourself with a particular technology; you may regret it later if people question your motives, or if the technology is shown to be ineffective.)

E. Environmental Justice

It is ironic that we should have a separate category for "environmental justice" in this report, because the principles of environmental justice permeate every facet of our work to protect public health (Principles of Environmental Justice, 1991). However there are specific opportunities within the environmental justice arena to make the case for cleaner alternatives to incineration.

It is environmentally unjust that hazardous waste landfills, chemical plants and incinerators (including cement kilns and other combustion facilities) are most often located in communities of color and low-income communities rather than white, affluent communities. Environmental justice will be achieved by correcting those wrongs, not by spreading out the problem, but by ensuring equal rights to a clean environment and protection of health.

If better alternatives to hazardous waste incineration are available for *some* communities, they need to be made available to *all* communities; particularly those where other industries have already dumped toxics into the environment.

For communities of color, low-income communities and tribal and indigenous groups, there are specific arenas in which environmental justice issues can be addressed. Executive Order 12898 on Environmental Justice, issued in 1994, mandated that all federal agencies assess the impacts of their actions on disproportionately-affected populations. Every agency has an obligation to at least investigate environmental justice allegations. Looking into environmental justice policies at the EPA Regional level and the state government level may provide another context in which alternatives to incineration can be discussed.

The U.S. Civil Rights Act (Title VI) allows citizens to file legal complaints where disproportionate health or safety impacts occur. Over the last several years, the Environmental Protection Agency's Office of Civil Rights has received hundreds of complaints of environmental injustice from communities all over the country. EPA's

track record of responding to environmental justice complaints is abominable (Cole, 2000), but filing a complaint still may be a worthy effort in holding EPA accountable to fulfilling their legal obligations under the Civil Rights Act.

For incinerators on or near tribal land, another set of federal and tribal regulations could apply. Many tribes have dedicated environmental officers or staff members, who are important people to communicate and collaborate with. Understand and respect that tribes are sovereign nations, and the government-to-government relationship between U.S. federal and state government and tribal government should be taken seriously.

F. Precautionary Principle in Practice

Thank goodness for all of us that a wise and diverse group of people from the grassroots and scientific community has clearly articulated the concept of preventing toxic exposures: *the Precautionary Principle*. The *1998 Wingspread Statement on the Precautionary Principle* reads:

> *"When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause-and-effect relationships are not fully established scientifically."*

What does this mean in the context of hazardous waste disposal? It means the burden of proof of harm from incinerator emissions should no longer rest with the public, but with the industry and government that produced the hazardous waste. It means that hazardous waste disposal decisions should be based on preventing, not merely managing, exposures. A precautionary approach to hazardous waste disposal implies a search for the safest, cleanest possible alternatives, including consideration of non-incineration technologies.

While many industries have challenged the Precautionary Principle, its common-sense approach to pollution prevention is reflected in environmental policy. One such example is the U.S. National Environmental Policy Act (NEPA). Under NEPA, agencies are required to assess alternatives to their proposed action, including the alternative of taking no action at all. This assessment typically takes place in the form of an Environmental Impact Statement (EIS) or a preliminary Environmental Assessment (EA). If left to their own devices, agencies often consider "no action" as the only alternative to their proposal (i.e. to build an incinerator or not to build an incinerator).

However the alternatives-seeking provision is the door through which technology options can be formally considered.

NEPA also has built-in opportunities for formal public comments at various stages of the EIS or equivalent process. Agencies must provide some realistic timeframe by which citizens and regulators can review and comment on the assumptions, scope and data in their assessment of alternatives. NEPA doesn't force the government to do what the citizens recommend. But providing comments on the assessment 1) gets information about non-incineration technologies on the table; and 2) preserves citizens' rights to file a lawsuit later on.

Internationally, the Stockholm Convention on Persistent Organic Pollutants (POPs), a global treaty aimed at phasing out and eliminating a group of toxic substances including dioxins, PCBs and pesticides, contains some precautionary language in regard to disposal of POPs wastes. The Convention, adopted in May 2001 and slated for ratification by the U.S., recognizes that non-incineration alternatives should be pursued to the extent that they do not create or release POPs. Other international agreements such as the Basel Convention, which addresses hazardous waste generation, movement/transportation and disposal, and other regional treaties support precautionary and preventative approaches to hazardous wastes.

What makes a good alternative to incineration?

A. Technology criteria

Years of arguing with government and industry decision makers about their so-called acceptable levels of toxic air emissions is enough to make a grown activist cry. Many groups fighting incinerators have used a set of "citizens' criteria" as a tool to measure the capability of a technology to meet demands for protection of health. These criteria reflect their own experiences in common language. Below is a basic set of criteria for hazardous waste destruction technologies.

1. **Highest possible destruction efficiency, using the most sensitive analytical techniques.** Destruction efficiency means that the waste entering a disposal technology is destroyed as completely as possible. Note that the term destruction efficiency applies to all waste outputs (effluents to air, land and water) while destruction removal efficiency, or DRE, only applies to air emissions. DRE considers contaminants in the solid and liquid residues to be removed and therefore not a problem. In reality toxic substances can be present in solids and liquids. Therefore an incinerator achieving a high DRE may still show poor performance on overall destruction efficiency (Costner, 1998).
2. **Containment of all by-products**. Some technical experts call this "hold-test-release." This criterion acknowledges that while no technology can make something into nothing, an ideal technology can control the waste and by-products in a contained environment. The option to re-process wastes within the contained system is also ideal, in order to achieve a higher destruction efficiency.
3. **Identification of all by-products, in all waste outputs (air, land and water).** We can't assess the efficiency of a technology that leaves us guessing at the quantity and toxicity of its by-products.
4. **No uncontrolled releases.** Regulatory agencies give disposal facilities permits under the assumption that they will perform perfectly. But human error and technology malfunctions happen! The ideal technology can maintain control over the waste stream all the way through the disposal process -- without releasing toxics into the environment even if the system malfunctions.

B. Worker safety issues

Providing a safe environment for workers dealing with hazardous wastes should always be a priority. In addition to the criteria listed above, here are some other criteria that could help set the high bar for worker protection:

- Low-temperature, low-pressure technologies. Not only can technologies that operate at low temperatures prevent toxic chemicals like dioxins from being formed, but they prevent workers from coming in close contact with the hazardous wastes at high temperatures. To illustrate: workers at chemical weapons incinerators have had to enter rooms where chemical agent was present and where room temperatures were high enough to render their protective clothing ineffective. This

poses a high risk of chemical agent exposure to workers. Lower temperature treatment of chemical agents significantly lowers that risk.

- Options for remote controlled operations. The less contact workers have with hazardous wastes, the better.
- Little to no corrosive materials needed for operations. Some non-incineration technologies like Solvated Electron Technology™ involve adding corrosive chemicals like ammonia to hazardous wastes, which could raise the health risks for workers responsible for handling these chemicals.
- Real-time monitoring for toxics. Any technology should provide for the constant monitoring of air quality within the plant to determine when workers may be exposed to hazardous chemicals. Further, workers should have access to treatment on-site in the event they are exposed.

Technology-neutral issues like the ability for workers to unionize, employee-training programs, equitable hiring practices, etc. all may indicate a more worker-friendly climate during plant operations. Highlighting these kinds of criteria could ultimately help protect workers' health and increase your capacity to organize cooperatively with workers and labor unions.

C. Vendor accountability

The manner in which a technology vendor interacts with the public, and their willingness -- or not -- to share information can be a good indicator of the level of accountability the vendor would have with workers and the public.

To illustrate this point, the company Startech, a vendor for a plasma arc technology (See the section on "When the alternatives are no good".) partnered with Burns & Roe in proposing its technology for chemical weapons destruction in the U.S. At various times the vendors refused to release detailed non-proprietary information on the technology, when other technology vendors complied. The technology failed its demonstrations for chemical weapons disposal and was no longer under consideration by the U.S. Army. However, the company claimed to the media that it had obtained a contract for U.S. non-stockpile chemical weapons destruction. The company also misrepresented the chemical weapons demonstration results internationally in South Africa, India, Ireland and elsewhere, presumably to create the perception that their plasma arc method was a success.

A good alternative to incineration is one for which the technology vendor is honest about the successes and limitations of the technology; willing to at least share all non-proprietary data with the public; and has a proven track record for providing a safe environment for workers.

D. Temporary technology use

Since a comprehensive solution to our hazardous waste problems must include a halt to

further generation of hazardous wastes, a good alternative technology to incineration is one that will only be used *temporarily*.

There are a few ways to translate that concept into criteria. For example, some technologies are waste stream specific, which means that the technology can only work effectively for a certain type of waste. This could reduce the chances that additional hazardous wastes could be shipped in for destruction. By contrast, incinerators, cement kilns and other combustion technologies are designed to burn just about any kind of waste, making them an easy target for hazardous waste producers.

Emphasizing the use of small-scale, transportable technologies whenever possible, may offer some assurance that the location of a hazardous waste destruction technology at any given site, will only be temporary. Many of the technologies listed in the chart on pages 20-21 can be skid-mounted, making them easily transportable (National Research Council, 2001).

E. Comparable costs

Public health and worker safety should be our number one priority when making technology decisions. But in reality, a decision makers' first concern is what it's going to cost them to use a safer technology. The specific answer to that question depends entirely on the treatment technology, waste stream, and the estimated length of operations. The best source for cost information on a non-incineration technology is directly from the technology vendor. The technologies chart on pages 20-21 include contact information for the vendor.

Along with getting cost-per-unit information from the technology vendor, life-cycle cost data for a holistic approach to incineration alternatives should include an assessment of cost reductions associated with clean production and zero waste measures. This approach has been effective for campaigns against medical waste incineration, which emphasize waste separation and changes in equipment and materials purchasing, in addition to use of non-incineration technology. Higher initial costs of switching over to these new approaches give way to lower costs over the long term (HCWH, 2002; CBNS, 1995).

Cost savings could be found for technologies which require fewer resources like electricity or water and those which can recycle water or other materials throughout the destruction process.

For hazardous waste non-incineration technologies, few cost comparisons exist. In the chemical weapons destruction program, the life-cycle costs (including construction, operations, etc.) for any of the alternative technologies are estimated to be about the same as for incineration (PMCD, 2002). However, the experiences with chemical weapons incinerators shows that delays in operations due to technical malfunctions and shutdowns are extremely expensive: close to $300,000 per day even when the facility was not in operation (PMCD, 2000).

Judging technologies

Suppose you have a set of non-incineration technologies. How can you identify one that is the best for your community for the specific wastes destined for destruction? Answers to the following questions could help easily distinguish advantages of each technology, in a manner that people with little or no technical expertise can understand.

- What kinds of waste can be processed in this system?
- What pre-treatment and/or post-treatment of the waste is required for the process?
- What is the rate at which wastes are processed?
- What is the destruction efficiency of the technology?
- What byproducts are formed? Can the technology fully contain and analyze all byproducts?
- Where would byproducts be disposed (water treatment plant, landfill)?
- How easily can the technology be controlled? What is the probability for upset conditions?
- What resources are needed to operate this technology -- electricity, water, land?
- Are any hazardous/corrosive solvents needed to operate this technology?
- What monitoring systems exist?
- Where else has this technology been used? What is its track record?

Requesting from technology vendors a “mass balance” sheet that details both the inputs and outputs associated with the technology, is a good way to answer many of these questions. At the very least, technology information is presented consistently so that it is easy to compare the attributes of all technology options.

Anyone who struggles with choosing between non-incineration technologies should not be surprised at this dilemma. For one thing, very few communities have achieved a set of acceptable alternative technologies to incineration, so very few models exist. For another, a choice between technologies could mean some kind of trade-off; making for a tough decision. Perhaps the technology that performs most efficiently has not been permitted anywhere else in the country, making it more difficult to deploy. Or maybe the technology that uses the least-toxic chemicals produces a higher amount of byproducts than a technology that needs a caustic solution to destroy the hazardous waste.

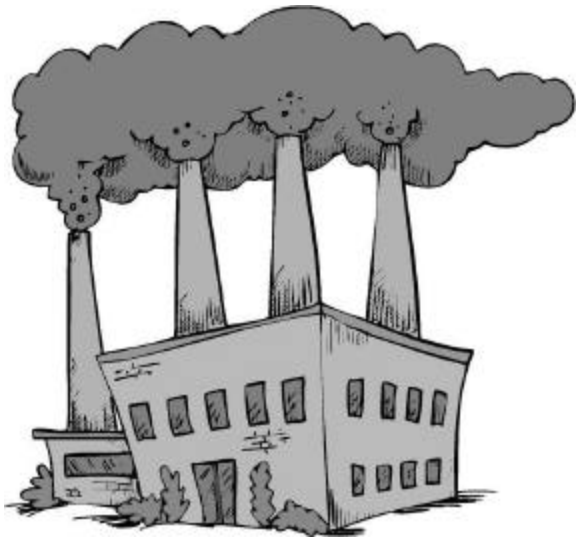
Technology options

The following is a partial list of non-incineration technologies for destruction of hazardous wastes. This chart does not imply an endorsement of any technologies by the authors. It is a list of technologies that have passed through some level of scrutiny by both the grassroots and regulatory communities -- and therefore a good place to start a search for safer disposal technologies. These technologies should not be used in a way that encourages industry to continue producing hazardous wastes.

Technology	Vendor	Process Description	Potential Advantages	Current uses	Vendor contact information
Base Catalyzed Dechlorination	BCD Group, Inc.	Wastes reacted with alkali metal hydroxide, hydrogen and catalyst material. Results in salts, water and carbon.	Reportedly high destruction efficiencies. No dioxin formation.	Licensed in the U.S., Australia, Mexico, Japan, Spain. Potential demonstration for PCBs destruction through United Nations project.	BCD Group Ohio, USA www.bcdinternational.com
Biodegradation	various, including Parsons	Microorganisms destroy organic compounds in liquid solutions. Requires high oxygen/nitrogen input.	Low-temperature, low-pressure. Contained process. No dioxin formation.	Chosen for destruction of chemical weapons neutralent in U.S. Potential use on other military explosive wastes. Typically used for commercial wastewater treatment.	Parsons California, USA www.parsons.com
Chemical Neutralization	various	Waste is mixed with water and caustic solution. Typically requires secondary treatment.	Low-temperature, low pressure. Contained and controlled process. No dioxin formation.	Chosen for treatment of chemical agents in U.S.	various vendors; see ACWA report and National Research Council reports in reference section.
Electrochemical oxidation (Silver II)	AEA	Wastes are exposed to nitric acid and silver nitrate treated in an electrochemical cell.	Low-temperature, low-pressure. High destruction efficiency. Ability to reuse/recycle process input materials. Contained process. No dioxin formation.	Under consideration for chemical weapons disposal in U.S. Assessed for treatment of radioactive wastes.	AEA Technologies USA: (412) 655-1200 UK: 1235 463405 www.aeat-prodsys.com

Technology	Vendor	Process Description	Potential Advantages	Current uses	Vendor contact information
Electrochemical oxidation (CerOx)	CerOx; Lawrence Livermore Nat'l Labs	Similar to process above, but using cerium rather than silver nitrate.	Same as above; cerium is less hazardous than silver nitrate. No dioxin formation.	Demonstration unit at the University of Nevada, U.S. Under consideration for destruction of chemical agent neutralent waste.	CerOx California, USA www.cerox.com
Gas Phase Chemical Reduction	Eco Logic	Waste is exposed to hydrogen and high heat. Resulting in methane hydrogen chloride.	Contained, controlled system. Potential for re-processing by-products. High destruction efficiency.	Used commercially in Australia and Japan for PCBs and other haz waste contaminated materials. Currently under consideration for chemical weapons destruction in the U.S. Potential demonstration for PCBs destruction through United Nations project.	ELI EcoLogic Int'l Ontario, Canada (519) 856-9591 www.eco-logic-intl.com
Solvated Electron Technology	Commodore Applied Tech., Inc.	Sodium metal and ammonia used to reduce hazardous wastes to salts and hydrocarbon compounds.	Reported high destruction efficiencies.	Commercially available in the U.S. for treatment of PCBs.	Commodore Applied Tech New York, USA (212) 308-5800 www.commodore.com
Supercritical Water Oxidation	General Atomics	Waste is dissolved at high temperature and pressure and treated with oxygen or hydrogen peroxide.	Contained, controlled system. Potential for re-processing by-products. High destruction efficiencies.	Under consideration for chemical weapons destruction in the U.S. Assessed for use on radioactive wastes in the U.S.	General Atomics San Diego, CA, USA www.ga.com/atg/aps/scwo.html
Wet Air Oxidation	various, including Zimpro	Liquid waste is oxidized and hydrolyzed in water at moderate temperature and pressure. May require secondary treatment.	Contained, controlled system. No dioxin formation.	Zimpro claims 300 systems worldwide, for treatment of hazardous sludges and wastewater.	Zimpro/US Filter Wisconsin, USA www.zimpro.com

When the alternatives are no good



There's an old adage that says, "If it looks like a duck and sounds like a duck, it's probably a duck." Some technologies promoted as alternatives to incineration are actually high-temperature combustion systems with toxic gaseous emissions...and therefore offer no advantage over incineration. Here are a few to look out for.

- **Plasma arc/ plasma torch.** In a plasma arc technology, waste is placed in a crucible then vaporized by extreme heat from an electric arc. Both plasma arc technologies and incinerators create large amounts of hazardous gases that need to be treated by air pollution control devices. Both of these types of facilities produce products of incomplete combustion (PICs), such as dioxin, polychlorinated biphenyls (PCBs), and polyaromatic hydrocarbons (PAH) which are dangerous to release into the environment. Both technologies transform hazardous wastes into toxic gases and a solid residue. The U.S. and European Union consider at least some plasma arc technologies as incinerators, and are regulated as such.

  Plasma arcs operate much hotter than conventional hazardous waste incinerators. The arc itself cannot be turned off instantly, so if there were ever a failure of the crucible or the vessel to contain the arc, it would blow up everything in its path. Operating a plasma arc system is expensive and typically requires a tremendous amount of electricity, a factor which alone makes the technology infeasible for communities with low electrical capacity.

  Some plasma arc vendors include: Startech, Burns & Roe, Integrated Environmental Technologies (IET), MGC and Vanguard.

- **Pyrolysis.** Pyrolysis is a term for systems that use high heat in the absence of oxygen -- sometimes referred to as "starved air combustion." Pyrolysis is often touted as an alternative to incineration, despite a lengthy track record of formation and release of dioxins, furans, and other toxics (HCWH, 2001).

- **Gasification.** Similar to pyrolysis, gasification is another starved air combustion technology that operates with limited oxygen. As with pyrolysis, gasification is similar to incineration technologies in that they burn at high temperatures and emit dioxins, furans, heavy metals and other pollutants into the air through smokestacks (BREDL, 2002).

Case studies

A. Alternatives to chemical weapons incineration -- Chemical Weapons Working Group, *by Elizabeth Crowe*

The Chemical Weapons Working Group (CWWG) is a grassroots coalition of citizens living near chemical weapons stockpile sites in the U.S., Pacific and Russia. The CWWG was formed in 1991 to work for safe, non-incineration destruction of chemical weapons, and direct involvement of citizens in the technology decision-making process. When looking at the issue of chemical weapons disposal, it was very clear what courses of action were not solutions: moving the weapons "somewhere else"; leaving them alone; accepting incineration. The only solution, then, was the use of safer disposal technologies which could contain toxics rather than release them routinely through a smokestack. Many technologies already existed that could first neutralize the lethal chemical agent at low temperatures and with low pressure, several non-incineration technologies could further treat that neutralent waste.

In 1993 community members from Madison County, Kentucky drafted a set of broad criteria for evaluating destruction technologies for chemical weapons (CAC, 1993). Other chemical weapons stockpile communities began to articulate criteria. The criteria included:

- An omission of incineration;
- Safety considerations before cost or politically-determined destruction deadlines;
- Assessment of risks from long-term, low-level exposures;
- A technology that can contain and fully analyze by-products;
- A technology that is waste stream specific; not available for future use; and
- Lower temperature and pressure for treatment of chemical agents.

In order to bring about change in the U.S. Army's chemical weapons disposal program, we needed to get to the people who held the purse strings for the chemical weapons disposal program: the U.S. Congress.

Our pressure on federal elected officials resulted in a breakthrough in 1995, when the Army offered neutralization-based technology options for destruction of bulk chemical agents in Maryland and Indiana. Permits for these facilities were issued in roughly 18 months (the average permitting schedule for chemical weapons incinerators was 7 years). Costs are comparable -- and may prove to be cheaper -- than incineration.

However, the Army only agreed to make the safer options available for bulk chemical agents, not assembled chemical weapons.

In 1996, again resulting from pressure on federal legislators from all chemical weapons stockpile sites, the U.S. Congress passed legislation calling for a federal program to identify and demonstrate at least two non-incineration technologies for disposal of assembled chemical weapons. That legislation was later modified to include implementation of non-incineration "pilot plants."

This program was called the Assembled Chemical Weapons Assessment (ACWA) program. The ACWA program included a dialogue process, by which citizens and activists from the affected communities worked by consensus with government and military decision-makers to 1) create technology demonstration criteria; 2) ensure clear communication and flow of information; 3) share oversight of technology demonstrations; and 4) report findings and recommendations back to the U.S. Congress.

Presently, four non-incineration technologies, demonstrated successfully through the ACWA program, could be used in place of incineration at any of the chemical weapons sites in the U.S. Existing incinerators could be retrofitted, or replaced, with these technologies. They are:

- Neutralization and Biological Treatment (Parsons/Allied Signal)
- Neutralization and Supercritical Water Oxidation (General Atomics);
- Neutralization, Supercritical Water Oxidation and Gas Phase Chemical Reduction (Foster Wheeler and Eco Logic); and,
- Silver II Electrochemical Oxidation (AEA Technologies).

The ACWA demonstrated technologies do not guarantee trouble-free chemical weapons destruction. However, they do represent some of the most protective technology currently available for lethal chemical agents and associated wastes. In 2000, the U.S. Environmental Protection Agency released a critique on ACWA technologies, finding that these technologies could be used for all hazardous waste streams regulated through the U.S. Resource Conservation and Recovery Act (RCRA). (EPA, 2000)

The Army's Non Stockpile Chemical Weapons Program has consented to assess non-incineration technologies for chemical weapons and secondary neutralent wastes. The list of technologies under review by the Army, National Research Council, citizens and regulators includes:

- Neutralization;
- Chemical Oxidation;
- CerOx Electrochemical Oxidation;
- Wet Air Oxidation;
- Gas Phase Chemical Reduction; and

- Unfortunately, Plasma Arc (See the “When the alternatives are no good” section.)

Post-September 11 security concerns regarding the chemical weapons stockpiles has resulted in the Army looking for ways to accelerate the neutralization process at Maryland and Indiana and possibly at other sites, even where incinerators are under construction. In March 2002, the Department of Defense recommended a combination neutralization and biological treatment technology for destruction of chemical weapons stored in Pueblo, Colorado. A similar technology decision for chemical weapons in Kentucky is expected to come in Fall 2002. The CWWG coalition continues to fight against incineration in Utah, Oregon, Arkansas and Alabama and ensure that the safest technologies are made available to those communities as well.

B. Kodak’s Toxic Colors – Citizens’ Environmental Coalition and the Kandid Coalition, *by Mike Schade*

Citizens’ Environmental Coalition (CEC) is a New York statewide grassroots coalition of over 110 community, environmental, and labor organizations working to eliminate pollution in New York State through its Community Assistance Program, Publication Clearinghouse and statewide Advocacy Campaigns. CEC first became aware of the severity of Eastman Kodak’s pollution in Rochester, New York in the late 1980s when concerned citizens in the Rand St. neighborhood bordering Kodak, contacted CEC about concerns regarding groundwater contamination. Since then, CEC has worked to hold Kodak accountable for their widespread pollution problems. The coalition’s goal for Kodak is to implement clean production strategies that result in a closed loop manufacturing system.

Kodak Park, Kodak’s headquarters in Rochester, NY is the largest manufacturing facility in the Northeastern United States and one of the largest exporters of manufactured goods in the country. Measuring about four square miles, the facility houses more than 150 major manufacturing buildings and has over 1,000 emission points. According to the U.S. Environmental Protection Agency’s (EPA) 2000 Toxic Release Inventory, Kodak emitted 4.2 million pounds of chemicals into the air and 681 thousand pounds to water at Kodak Park. It is the top emitter of cancer-causing chemicals in New York, and one of the largest nationally.

In March of 1997, CEC and other organizations formed the Kandid Coalition, a Rochester-based grassroots coalition of concerned residents, environmental, and community organizations focused exclusively on identifying problems at Kodak, making

the company accountable for its pollution, and proposing solutions. Over the years CEC and the Kandid Coalition's strategy has been rooted in grassroots organizing and advocacy. The groups have publicized Kodak's poor environmental record and deadly incinerator emissions by orchestrating media events, letter writing campaigns, shareholder resolutions, reports, and public comment periods and hearings.

CEC and the Kandid Coalition realized the many opportunities for Kodak to reduce pollution and implement environmentally protective strategies at Kodak Park. But by far, the most threatening to the surrounding community and environment has been the use of hazardous waste incineration. CEC and the Kandid Coalition have a multi-pronged approach to reduce and ultimately eliminate this threat to our health. In the short term, the coalition has worked to reduce emissions from the incinerators and from the entire facility, while in the interim proposing safer, non-incineration disposal of hazardous waste, and maintaining a long-term goal of changing the way the products are created to institute a clean production manufacturing system where hazardous waste is not generated.

To accomplish these goals, CEC and the Kandid Coalition have taken the following actions to set Kodak on a path towards clean production.

Documenting Kodak's Pollution: CEC and the Kandid Coalition have documented Kodak's pollution by submitting New York State Freedom of Information Law requests to receive copies of various air and operating permits, test results from monitoring, risk assessments, health studies, etc. In addition CEC and the Kandid Coalition have conducted research through newspaper articles, trade papers, and other sources such as the EPA's Toxic Release Inventory database. Groups have documented and publicized the information researched through fact sheets, fliers, and reports. In 1998 the coalition published "A Tarnished Image: the Eastman Kodak Performance Scorecard", a 32 page report documenting Kodak's environmental, labor, and subsidy abuses. Recently, CEC and the Kandid Coalition have developed websites (www.kodakstoxiccolors.org and www.kandidcoalition.org) to build awareness about Kodak's pollution problems.

Community Outreach: Members of CEC and Kandid coalition have gone door to door in neighborhoods surrounding the facility across New York to educate citizens about Kodak's pollution and clean production alternatives. Coalition members leafleted stores that sell Kodak film, tabled at public events like music festivals, given presentations to other community organizations, and held public education events. For example, in October of 2001 the coalition held a day long Teach-In at a local university which featured a keynote address about alternatives to incineration. During this session students and community members learned more about some of the alternative technologies discussed in this report. CEC plans on holding more community meetings for the coalition and community members to discuss alternatives to incineration and a clean production agenda for Kodak.

Media Campaign: To draw attention to Kodak's pollution, CEC and the Kandid Coalition have worked to keep the issue in the public's eye over the years by organizing media events such as press conferences, street theatre actions, and protests. In April of 2002 groups across New York State organized a "Statewide Day of Action for Clean Air" where citizens organized 9 events in 7 cities. All across New York citizens sent Kodak a unified message to make a commitment to phasing out and shutting down their hazardous waste incinerators. Events included press conferences in front of Kodak's incinerator as well as corporate chains that sell Kodak film, tabling at Universities, and leafleting in public. In addition the coalition has started a targeted advertising campaign in progressive organization's newsletters to educate people about Kodak's incinerators, requesting people to call and write Kodak requesting that they phase out and shut down their hazardous waste incinerators.

Letter Writing: CEC and the Kandid Coalition have distributed action alerts to local and statewide mailing lists and internationally through websites and email list-servs. In March of 2002 the coalition organized a coalition of over 60 organizations to call on federal and state health agencies to address the high rates of childhood cancer in the neighborhoods surrounding Kodak. In June 2002 community residents mailed over 2,000 postcards to Kodak calling on the company to make a commitment to phasing out and shutting down their hazardous waste incinerators.

Shareholder Resolutions: CEC and the Kandid Coalition have worked with concerned shareholders to introduce a number of Shareholder Resolutions to apply pressure from within the company. One resolution that has been introduced a number of times, *Disclosing Environmental Liabilities to Shareholders,* calls on Kodak to calculate the financial liabilities posed by their pollution. By educating shareholders and Kodak about the real financial costs of their pollution, we hope to advance our agenda for clean production which would save Kodak money in the long run. At Kodak's 2002 annual meeting citizens organized a "Vigil for Justice" outside where activists held candles and were dressed up in black funeral attire with their faces painted white, alongside of cardboard cutouts of people impacted by Kodak to show shareholders the true costs of pollution. The coalition has also been successful in receiving the support of institutional investors like New York State Comptroller Carl H. McCall and the Sisters of Mercy of Buffalo who divested over 25,000 shares of Kodak stock because of Kodak's environmental record.

Working for State Agency Oversight: The coalition has set up numerous meetings with key members of state environmental and health agencies as well as policy makers to discuss our concerns about Kodak. In addition CEC and the Kandid Coalition have organized citizens to comment on Kodak's various permits, worked to bring people out to public meetings, and held media events outside of public hearings.

Moving Forward to Clean Production: By networking nationally with groups in the Global Alliance for Incinerator Alternatives, National Dioxin Network, and Clean Production Network, the coalition plans to continue matching Kodak's waste streams with clean alternatives. As an interim step toward clean production, CEC and the Kandid Coalition are presenting Kodak with the option of using safer non-incineration technologies to deal with its current hazardous waste stream. Through collaboration nationally with environmental experts, CEC staff conducted a preliminary review of the waste codes (classifications) of chemicals that Kodak incinerates (NYSDEC Part 373 application, SWIMS data). This shows that according to EPA's report "Potential Applicability of Assembled Chemical Weapons Assessment Technologies to RCRA Waste Streams and Contaminated Media" many of the hazardous wastes – particularly those chlorinated chemicals responsible for dioxins – could be destroyed by one of the ACWA technologies.

CEC and the Kandid Coalition are recommending that Kodak and the New York DEC consider the following technologies as an interim solution to address the ongoing production of hazardous waste at Kodak Park, while developing an overall clean production program:

- Eco Logic's Gas Phase Chemical Reduction Technology
- AEA Silver II Technology
- CerOx Process
- Supercritical Water Oxidation Technology

In June of 2002 the coalition sent letters to Kodak, the Governor, and state agencies detailing the research conducted on alternatives to incineration. CEC and the Kandid Coalition hopes this will begin to initiate communication with Kodak and the New York State Department of Environmental Conservation on acceptable technologies. Over the course of the coming years the groups will persist with their grassroots organizing and advocacy strategy (as outlined above) and hopes to incorporate new tactics and strategies to press for clean production. To research the ways Kodak can move forward with a clean production program, the coalition hopes to work with technical experts nationally and locally to examine and research the way Kodak creates its products, in order to find solutions to eliminating the production of hazardous wastes. In addition CEC and the Kandid Coalition are considering starting up a bucket brigade around Kodak Park to empower local residents to monitor the air emissions in the surrounding neighborhoods in order to make a better case for clean production.

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US EPA, 2000 Toxic Release Inventory

Resource List

Reports and documents

Alternative Technologies

Advanced Treatment Technologies
This is a good report that identifies and describes permanent treatment technologies. Available from **www.chej.org**

Appropriate Technologies for the Treatment of Scheduled Wastes
Review Report Number 4 – November 1997 – CMPS&F – Environment Australia
This is a report initiated by Environment Australia that is a review of the development and availability of technologies to treat wastes. *Available at http://www.erin.gov/au/industry/chemicals/swm/swtt/summary.html*

Chlorine, Combustion and Dioxins: Does Reducing Chlorine in Wastes Decrease Dioxin Formation in Waste Incinerators? By Pat Costner, Greenpeace
This is a report that examines many scientific studies regarding whether reducing chlorine actually impacts dioxin emissions in incinerators. *Available at www.greenpeace.org*

Evaluation of Demonstration Test Results of Alternative Technologies for Demilitarization of Assembled Chemical Weapons
This is another report that looks at alternative technologies to address incineration. *Available at http://www.nap.edu/books/0309068975/html/*

How to Shut Down an Incinerator – A toolkit
An essential toolkit for activists fighting incinerators (primarily medical waste but there is also relevant information for other types of incinerators) in their own communities. *Available from www.no-harm.org*

Non-Incineration Medical Waste Treatment Technologies – A resource for hospital administrators, facility mangers, health care professionals, environmental advocates, and community members.
This is the long-awaited report from the international Health Care Without Harm campaign that offers a wealth of information about alternatives to medical waste incineration. *Available at www.noharm.org*

Potential Applicability of Assembled Chemical Weapons Assessment Technologies to RCRA Waste Streams and Contaminated Media
This document provides detailed information about the alternative technologies in the Assembled Chemical Weapons Assessment (ACWA) program, and presents an overview of each technology, including its applicability, performance, and other factors. *Available at http://www.epa.gov/tio or at http://www.clu-in.org*

Technical Criteria for the Destruction of Stockpiled Persistent Organic Pollutants
By Pat Costner, Greenpeace
This report is an evaluation of the various ways to treat and destroy persistent organic pollutants. There is useful information about many alternative destruction technologies in this report. Available at www.greenpeace.org.

Clean Production

Citizens Guide to Clean Production
By Beverly Thorpe – Clean Production Network
This is a guide for citizens that examines some key concepts and strategies and offers ways that individuals and groups can help move production and consumption toward a safe, sustainable future. *Available from: Lowell Center for Sustainable Production / One University Avenue / Lowell, MA 01854-2867*

The Safe Hometowns Guide – How to do a Community Reassessment of Chemical Site Safety and Security after September 11, 2001
By Sanford Lewis – the Safe Hometowns Initiative
A guidebook for citizens to conduct community reassessments of safety and security of sites where chemicals are stored, used or produced. *Available from: www.safehometowns.org*

Preventing Industrial Toxic Hazards – A Guide for Communities
By Marian Wise and Lauren Kenworthy - Inform
A guide for communities seeking to encourage local plants to reduce their use of toxic chemicals and their creation of toxic waste. *Available from: Inform / 381 Park Avenue South / New York, NY 10016-8806 / (212) 689-4040*

Organizational Resources

Alternative Technologies

California Communities Against Toxics
c/o Jane Williams
P.O. Box 845
Rosamond, CA 93560

The Chemical Weapons Working Group
P.O. Box 467
Berea, KY 40403
Phone: 859-986-0868
Fax: 859-986-2695
www.cwwg.org

Environmental Protection Agency
Technology Innovation Office
U.S. EPA (5102G)
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
Phone: 703 603-9910
http://www.epa.gov/tio/

Global Alliance for Incinerator Alternatives
PO Box 19405
Washington, DC 20036
Phone: 202-387-8030
www.no-burn.org
gaia@no-burn.org

Greenpeace International
Dr. Darryl Luscombe
Phone: 416-538-8827
Fax: 416-538-5966
darryl.luscombe@au.greenpeace.org

Health Care Without Harm
1755 S Street, NW
Suite 6B
Washington DC 20009
Phone: 202-234-0091
Fax: 202-234-9121
info@hcwh.org

Interstate Technology and Regulatory Council
Rick Tomlinson
Program Director
444 North Capitol Street, NW
Suite 445

Washington, DC 20001
Phone: 202-624-3669
Fax: 202-624-3666
www.itrcweb.org

Sierra Club
Neil Carman, Ph.D.
Clean Air Program Director,
Former Texas Air Control Board Investigator
PO Box 1931
Austin, TX 78767
Phone: 512-472-1767
Neil_carman@greenbuilder.com

Clean Production

Clean Production Network
1100 North Davis Road
East Aurora, NY 14052
Phone: 716-805-1056
info@cleanproduction.org

Grassroots Recycling Network,
P.O. Box 49283,
Athens, GA 30604-9283
www.grrn.org

Inform
120 Wall St., 16th Floor
New York, NY 10005-4001
Phone: 212-361-2400
Fax: 212-361-2412
www.informinc.org

Institute for Local Self-Reliance
Self-Reliance, Inc.
2425 18th Street, NW
Washington, DC 20009
Phone: 202-232-4108
Fax: 202-332-0463
ilsr@igc.org

The Lowell Center for Sustainable Production
University of Massachusetts Lowell
One University Avenue
Lowell, Massachusetts 01854-2866
Phone: 978-934-2980
Fax: 978-452-5711
www.uml.edu/centers/lcsp

The Massachusetts Toxics Use Reduction Institute
University of Massachusetts Lowell
One University Avenue
Lowell, Massachusetts 01854-2866
Phone: 978-934-3275
Fax: 978-934-3050
www.turi.org

Strategic Counsel on Corporate Responsibility
Sanford Lewis
PO box 79225
Waverly, MA 02479
Phone: 617-489-3686
Fax: 781-891-6889
gnproject@earthlink.net

Incineration, Toxics and Environmental Justice

Alaska Community Action on Toxics
505 West Northern Lights Boulevard, Suite 210
Anchorage, Alaska 99503
www.akaction.net

Center for Health, Environment & Justice
PO Box 6806
Falls Church, VA 22040
Phone: 703-237-2249
Fax: 703-237-8389
Dioxin@chej.org

Environmental Justice Fund
310 Eighth St. #309
Oakland, CA 94607
Phone: 510 -834-8920
www.ejfund.org

(Note: EJ Fund is a network of several national and regional environmental justice groups in the U.S., whose contact information can be found here)

Environmental Justice Resource Center
223 James P. Brawley Dr.
Atlanta, GA 30314
Phone: 404-880-6911
www.ejrc.cau.edu

Greenaction for Health and Environmental Justice
One Hallidie Plaza
Suite 760
San Francisco, CA 94102
Phone: 415-248-5010

Indigenous Environmental Network
P.O. Box 485
Bemidji, MN 56619
Phone: 218-751-4697
www.ienearth.com

International POPs Elimination Network
517 College Street, Suite 401
Toronto, ON M6G 4A2
Phone: 416-960-9244
Fax: 416 960 9392
www.ipen.org

Xavier University of Louisiana
Deep South Center for Environmental Justice
1 Drexel Drive 45b
New Orleans, LA 70125
Phone: 504-304-3324
www.xula.edu/dscej

Organizational Development

Changework
c/o Tema Okun
1705 Wallace St.
Durham, NC 27707

Environmental Support Center
1500 Massachusetts Ave., NW Suite 25
Washington, DC 20005
Phone: 202-331-9700
www.envsc.org

Peace Development Fund
PO Box 1280
Amherst, MA 01004
Phone: 413-256-8306
www.peacedevelopmentfund.org

Peoples Institute for Survival and Beyond
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Chemical Weapons Working Group

The Chemical Weapons Working Group (CWWG) is a grassroots coalition of citizens living near chemical weapons stockpile sites in the U.S., Pacific and Russia. The CWWG was formed in 1991 to work for safe, non-incineration destruction of chemical weapons, and direct involvement of citizens in the technology decision-making process.

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Citizens' Environmental Coalition

Citizens' Environmental Coalition is a statewide grassroots environmental organization working to eliminate pollution in New York State through our Community Assistance Program, Publication Clearinghouse and statewide advocacy campaigns.

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