Waste, energy and the crisis of confidence: the American people and the history of resource recovery from 1965 to 2001

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Waste, energy and the crisis of confidence: the American people and the history of resource recovery from 1965 to 2001

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Dedication

To my Grandma and Grandpa, who I wish could see this.
# TABLE OF CONTENTS

Acknowledgments ................................................................. iii  
Abstract ............................................................................. vii  
Introduction .......................................................................... 1  
Chapter 1 ........................................................................... 11  
The St. Louis Refuse-Derived Fuel Facility or the Largest Plant That Never Was  
Chapter 2 ........................................................................... 60  
Baltimore, the Bastards and the Most Famous Pyrolysis Plant  
Chapter 3 ........................................................................... 110  
The Ames Anomaly in the Crisis of Confidence  
Chapter 4 ........................................................................... 164  
The Resource Recovery Crisis and the Rise of Recycling  
Conclusion .......................................................................... 219  
Bibliography ......................................................................... 228
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Abstract

From the mid-1960s until the end of the 1970s, a type of municipal solid waste management known as resource recovery was expected to solve both America’s trash accumulation problems and projected resource shortages. A wide array of citizens and institutions all tried to maximize the utilization of waste through a mix of recycling and waste-to-energy processes. Each of the groups involved saw the value of resource recovery from their own perspective: as a way to save materials, make money, get rid of trash, produce energy, or conserve (or preserve) land. Despite their different motivations, these groups were willing to cooperate towards an ultimate goal of recovering what would otherwise be lost in landfills or old-fashioned incinerators, which did not produce anything but ash.

This dissertation traces the history of this push for maximum solid waste utilization. Three case studies provide particular insight to the ideas, problems, and motives involved in resource recovery: The first federally funded resource recovery plant in St. Louis, Missouri; Monsanto’s expensive technological failure in Baltimore, Maryland; and the Arnold O. Chantland Resource Recovery Plant in Ames, Iowa, which is the only remaining plant in the nation. Through these studies and an examination of the ideas of environmentalists such as Barry Commoner and Rachel Carson, this work traces the end of the country’s technological optimism, the environmental struggles of urban areas, the roots of some divisions in American attitudes toward the environment, and the rise of the recycling movement.
Introduction

The Roots of the Resource Recovery Story

In the mid-1960s the much-practiced act of burning solid waste had been "recognized as a prime source of air pollutants." As trash accumulated, a growing fear took root that Americans were "in danger of being engulfed in ... mountains of waste ... building around the cities."¹ Reports circulated that the per capita waste production of Americans would grow from the 1969 estimate of 5.3 pounds to 8 pounds a day in 1980, and this was up from the meager 2.75 pounds of 1920. The large amounts of litter at the time likely worsened people's fear of being engulfed by trash. In 1969 Kansas, a one mile section of a two-lane highway had "770 paper cups, 730 empty cigarette packs, 590 beer cans, 100 whiskey bottles and 90 beer cartons." People began to see that "one person's trash basket is another's living space," and the Director of the Bureau of Solid Waste Management stated that,

The most convenient means for disposal—usually an open-burning dump—was, and unfortunately still is, most frequently employed. However, it is becoming increasingly obvious that such a casual approach to solid-waste management—which may have been acceptable in an earlier day—can no longer be tolerated in a country of over 200 million persons, 70 per cent of whom live in urban areas.²

The growth of cities via urban sprawl had put a crunch on where regulated landfills could be sited. By the mid-1970s, the nation's mayors agreed that siting landfills had become their "number one headache."³

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¹ "Why the U.S. is in Danger of Being Engulfed by its Trash," U.S. News and World Report 67, no. 10 (Sept. 8, 1969), 64.
² Richard D. Vaughan quoted in ibid., 65.
While local and state officials were most concerned about the political side of waste, the promise of wiser material use and energy creation most excited the American imagination in the early 1970s. The United States experienced its first energy crisis in the winter of 1973-1974. Just a year earlier the Environmental Protection Agency (EPA) had announced that it would fund, under Section 208 of the Resource Recovery Act, demonstration resource recovery plants that could process at least 200 tons of municipal solid waste (MSW) per day. Chemical, mechanical, and mineral disposal processes were all considered based on their ability to recover resources and their economic competitiveness to traditional methods. The EPA had first suggested funding resource recovery-type solutions in the late 1960s primarily to reduce or eliminate trash, but as biologists such as Paul Ehrlich and Garret Hardin warned of the danger of resource shortages, the importance of conservation gained ground, as did energy recovery after the next decade’s energy crunches began. Despite concern over growing landfills and resource shortages, "a consciousness of limits did not arise naturally from the experience of urbanites coping with the mountains of solid waste they produced."\(^4\) By and large Americans assumed that the technology that got them into their mess would be able to get them out. The reaction to the voices of concern in the late 1960s and the early 1970s was less a call for limits than a belief that the country needed to more carefully manage its resources and energy. This included the careful accounting of garbage.

The end of any mainstream belief in a resource scare and the focus on energy production by the late 1970s would spell the unofficial end of resource recovery, as new waste-to-energy programs gained prominence. Oil had been a key component of the nation’s post-war affluent lifestyle. From 1950 to 1970, U.S. oil consumption increased

\(^4\) Melosi, *Garbage in the Cities*, 234.
from 900,000 to 3.4 million barrels a day. In the same twenty years, America's Gross National Product increased by 102% and the country's energy consumption by 98%. The United States, which had less than six percent of the world's population, consumed more than 30% of its energy. By the end of the 1970s the only resource shortage that worried politicians was the energy shortage.

Tax benefits to producers and regulation of prices to consumers have kept the price of energy below its true replacement cost, and thereby promoted consumption and waste. Large-volume consumers of electricity and natural gas have been given discounts. Government policy has subsidized and protected energy-inefficient truck and air transportation. The interstate highway system has encouraged automobile use. Local highways have drawn people, businesses, and industry out of central cities into suburbia. Thus, the American people have been led to believe that the oil and gas they consume will remain cheap, when in fact new additions to oil and gas supply already are expensive and inevitably will become more so.

The government was willing to consider obtaining energy from just about anywhere, even garbage. The sometimes competing, sometimes cooperative goals of waste disposal, environmental cleanliness and energy extraction led to a great deal of confusion over which federal agency, if any, was responsible for trash. The EPA, Energy Research and Development Administration (ERDA), the Federal Energy Administration (FEA) and later the Department of Energy (DOE) were all perceived to have some role in the issue, but what the roles were was not decided until the end of the decade. By that time, America was on the verge of moving on to a new waste disposal method, recycling.

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5 Executive Office of the President, Energy Policy and Planning, "National Energy Plan," 2, MS95-01, Box 1, FF 12, Wichita State University Special Collections
6 Ibid., 3, 4.
A Recycling-Resource Recovery Divide?

While a common argument persists that resource recovery and recycling were in opposition to each other and could not co-exist, this simply was not true. In the mid-1970s, resource recovery proponents and paper recyclers had negotiated a relationship, agreeing to recycle whatever amount of paper could be utilized and turn the rest into energy. This collaboration did nothing to curb the excess of production and consumption that deeply bothered resource recovery opponents, but many people believed it was equal to or better than the alternative of landfiling, and it was a definite improvement over the prevalent practice less than a decade earlier of open-dump burning. If there were more environmentally-minded waste disposal options, they were not being used in the 1970s and often not even by the end of the first decade of the 21st century. Environmentalists might have been pushing for less waste, but waste continued to be made. By the end of the 1980s, over 25% of waste was recycled, a number that could also have been achieved and exceeded with resource recovery. The rest of it was landfilled or shipped away, usually not too far, but sometimes halfway across the country. Environmental gains achieved by recycling, have largely been in changing mentalities, which is what recycling proponents claimed was its primary advantage from the beginning, but the extent that it has changed practice has been a subject of debate.

Although environmentalists often paint resource recovery with the same brush as incineration, it is disingenuous to portray them as the same thing. Early in the 1970s, people often used “recycling” and “resource recovery” interchangeably. By the end of

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the 1970s nearly everyone used “resource recovery” and “waste to energy” interchangeably. By the early 1980s, people almost exclusively discussed “waste to energy,” and by the 1990s, it was again common to talk about incineration, a term which had been in use since the end of the 19th century. Today the preferred term is “mass burn.” So, do all of these words mean the same thing? In some circumstances they might, but they really refer to different stages of an evolving technology and the ideas associated with it. The push for resource recovery represented a certain kind of thinking and the desire for a certain kind of solution.

People who promoted resource recovery were trying to extract the best possible use out of resources. The interpretation of “best” might be measured in terms of economics or efficiency. The idea was that a resource should be utilized to serve its most useful purpose. Resource recovery proponents were dyed-in-the-wool conservationists. Many of historian Samuel Hays’s statements about Progressive Era conservationists could equally be applied to resource recovery proponents. He noted that “they expressed some fear that diminishing resources would create critical shortages in the future. But they were not Malthusian prophets of doom and gloom.” Also true was that they both, “envisaged, even though they did not realize their aims, a political system guided by the ideal of efficiency and dominated by the technicians who could best determine how to achieve it.”

Such conscientiousness about resource use cannot be applied to incineration, which sought only to eliminate or minimize trash, not to utilize it. Even though non-utilitarian preservation efforts enjoy a kind of moral hegemony over

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conservationism, both entail thought about nature, which incineration does not necessarily require.

There was even a kind of resource recovery method in the Progressive Era called reduction. By the early 1900s, businesses had developed nine different types of reduction plants, but basically the process cooked animal and vegetable wastes and pressed them into grease, which could be used to make soap and perfume; tankage, "a dry vegetable, animal, and mineral material, which is fairly stable, mostly fibrous, and has some fertilizing value;" and a mysterious “evil liquid difficult to get rid of.” From 1893 to 1914 forty-five reduction plants were built, twenty-two of which were still in use in 1914. The first American reduction plant was built in Buffalo, New York, in 1893, cost $55,000 and after a year-and-a half of operation had lost $18,000. The complicated nature of the process, at least compared to incineration, is a commonality between reduction and future resource recovery techniques, as is its attempt to get the most use out of material. The motive behind these attempts was to make money, just as that was the motive for businesses involved in resource recovery in later years.

Finally, as Hays proved in Conservation and the Gospel of Efficiency, scientists were driving the attempts to conserve resources. Economists would be added to the mix in the later resource recovery effort. The area of waste had its own scientists and

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engineers, usually businesses employed these to help make companies more efficient or cities to help clean up the streets. Melosi, pointed out, however, this early “interest in the utilization of wastes” was very “limited.” The scientists and engineers were interested in waste as it applied to their business or their city. Melosi said, despite their narrow focus, the effort of cities to scientifically deal with wastes constitutes an important change in waste management, towards the modern balance of “efficiency, sanitation and cost.”

The resource recovery movement in the 1970s sought to perfect the use of resources in the same way efficiency pioneer Frederick Winslow Taylor sought to help businesses find the “one best way” to perform certain tasks. Under resource recovery that “best way” might mean emphasizing recycling one week and waste conversion the next week, but it was the mastery of knowing when to do which and learning to get all the resources to the markets that needed them that was the “one best way” to manage resources.

Competing countries like England and Germany had been interested in broader, national ideas of waste utilization since the late 19th century, and historians Susan Strasser and Carl Zimring have both written about the nationalist waste conservationism in the United States during war time, as well as many other important aspects of waste utilization. Interest in history related to garbage has been growing since the first edition of Melosi’s Garbage in the Cities was published in 1981. Still, resource recovery has not received much in-depth examination by historians. Professionals, sociologists, political scientists, geographers, economists and environmental studies scholars have studied the technological history of resource recovery plants and issues such as plant siting and conflicts. Former Solid Waste Association of North America President Lanier

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Hickman’s *American Alchemy: The History of Solid Waste Management in the United States* is a detailed study of the policy and technical history of resource recovery plants and does a fine job of differentiating between resource recovery plants and later disposal methods, but his focus was not on the ideas behind resource recovery, which is a void that my dissertation seeks to fill.  

The early association with recycling is understandable as “recycling” was not an especially common phrase before the 1970s and because many of the products were recycled even in today’s sense of the word. Most plants recycled any material that could be utilized. Utilization implied that some market for the product existed. If a material could not be sold, the general belief that there was that no need for it and thus no need to recycle. The key difference was that resource recovery used highly technological methods to recycle instead of the more common present-day practice of source separation. Is there an unwritten law that recycling cannot be done with high-tech equipment? We seem to take that assumption for granted, but it is not immediately clear why the recyclers often emphasize the process rather than the end material result. This work explores the competing ideologies that drove the wedge between the recyclers and the resource recovery proponents.

The commonality between resource recovery and recycling is what separated the former process from waste to energy (WTE). Although both methods would be referred to interchangeably until “resource recovery” and many of the ideas behind it were

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modified or abandoned in the 1980s. WTE became a popular term at the end of the 1970s when the Department of Energy (DOE) and the Environmental Protection Agency (EPA) made the decision to end funding for the U.S.-style resource recovery plants that sorted as well as burned waste. The American plants were much more complicated and usually failures. The European-style systems, which relied on populations who sorted their own waste, were much simpler and less ambitious. Under the push for WTE the only resource that carried much weight was energy. In most of these plants all the waste was burned together and any salvageable metals were separated out afterwards. This single-minded pursuit of new energy sources was different than the original resource recovery efforts and created a clear conflict for environmentalists pushing for less consumption.

The fear of dioxins drove the final, dividing wedge between WTE-supporters and environmentalists along with many Americans, who feared the dangerous, though highly contested emissions of the plants. More than anyone else, biologist Barry Commoner was responsible for arousing American fears of dioxins and thus contributed significantly, along with government policy changes, to the downfall of WTE projects. He played an important role in the anti-resource recovery camp throughout the story, as did the arguments of environmentalists and economists such as Rachel Carson, Neil Seldman, and E.F. Schumacher. The pro-resource recovery side lacked many famous characters, but its roots are embodied in many traditional American ideologies, examined in this dissertation.
Methodology

There were hundreds if not thousands of resource recovery efforts that took place across the country from the 1960s to the present day. Engineers, businesses, scientists, cities, backyard inventors, as well as universities and the military all pursued ways to recover resources and energy from spent materials. To try to cover all or many of them would have been impossible and partially redundant, as Hickman does such a thorough job of exploring the most famous kinds of resource recovery technology. On the other hand, a single case study would not be able to do justice to this intricate and fascinating issue. Only one plant survived long enough to use as such a narrative vehicle, and it was in large part an anomaly. Instead I decided to use three resource recovery plants to trace the local, national and ideological rise and fall of the resource recovery movement in the United States. Each plant is the subject of a chapter, and each chapter roughly moves forward chronologically and covers some area of ideology. I chose the St. Louis Union Electric refuse-derived-fuel (RDF) plant, because it was the first plant to receive EPA funding. This chapter looks at social, national policy, and economic aspects of the early days of resource recovery. The next chapter examines the development of Monsanto’s Baltimore Pyrolysis Plant. The emphasis here is on how resource recovery tied into the early environmental movement, its relationship to business, and local and national regulatory responsibility. The last two chapters are about the Ames, Iowa, refuse-derived fuel plant, which is the oldest resource recovery plant in the country and the only one to survive into the 21st century. These examine the decline in technological faith, the proliferation of recycling, the value of land, risk assessment and how resource recovery
involved the growing entrenchment between those with a faith in technological solutions and those without. Here is the story…
Chapter 1: The St. Louis Refuse-Derived Fuel Facility or the Largest Plant That Never Was

Anyone in St. Louis who believed in omens must have been suspicious the last day of February 1974. The Union Electric Company, which had been burning garbage in one of its coal boilers for the past three years as part of a federally funded demonstration project, announced on that day that it would turn the project into a full-scale operation. Every day, St. Louis residents were producing 1,000 tons of solid waste. Two aging incinerators were burning about 65% of the trash, while the rest was being burned as fuel in a special Union Electric coal boiler. The demonstration project had considerably eased the burden of St. Louis County’s three landfills, although they still had to take ash from the plants, as well as any miscellaneous garbage not handled through other means. The county believed that the three landfills, plus two permitted ones that had not yet opened would be full in just five years. That, combined with the dilapidated incinerators, left the city of 622,000 in trouble.1 Fully aware of the headache of managing municipal solid waste (MSW), Mayor Alphonse Cervantes had declared at the onset of the experiment that, “If it works, it’s going to be a godsend for us.”2

The plant did work, better, in fact, than any of the federally subsidized so-called “resource recovery” demonstration plants of the 1970s. The plant operated pretty much with only the most expected of hitches until 4:07 p.m. the day Union Electric announced that it would take charge of all of the city and surrounding area’s garbage. After announcing that the utility company would build, own and operate its new facilities

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2 William H. Stroud, “A Plan to Convert City Refuse into Electricity,” St. Louis Dispatch, 16 November 1971, 6A
without any further governmental support, a two-alarm fire broke out at its current operation, shutting down the plant indefinitely. The city official discussing the plans with Union Electric left the building 15 minutes before the fire. The city would not be so lucky four years later when Union Electric would finally decide to abandon the mega-project.³

The Union Electric plant was the first resource recovery plant to receive a demonstration grant from the federal government. In June 1968, the U.S. Public Health Services gave St. Louis a $40,000 grant to be combined with $20,000 of the city’s money for an investigation of burning “refuse with coal in large utility boilers.” The consultants for the city’s incinerator, Horner and Shifrin, Inc., suggested the process and using Union Electric’s facility’s.⁴ The demonstration plant began operating in 1972 and cost the EPA and Union Electric, which paid the city’s portion, $2.5 million for the whole two-year run. The process collected waste to shred in a hammermill; after shredding, it went through a magnetic separator that removed any ferrous materials. The company took the remaining waste to Union Electric’s Meramec power plant and fed it into the boiler. Workers collected any noncombustible refuse of possible value after it had been burned with coal.⁵ The process was one type of method in the refuse-derived fuel (RDF) family.

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³ Bob Hardy, “For Your Information,” Radio Station KMOX 1 March 1974, 1 Poelker University Archives, Department of Special Collections, Washington University Libraries; “Pilot Plant Burns,” St. Louis Globe-Democrat 1 March 1974, 14A
⁴ Robert L. Schneider, Grants Management Specialist Demonstration & Planning Grants Administration Unit Solid Wastes Program, to Mr. G. Wayne Sutterfield, Commissioner of Refuse Collection and Disposal, City of St. Louis 11 March 1968, University Archives, Department of Special Collections, Washington University Libraries; Stuart Symington and Edward V. Long, Western Union Telegram to Hon Alfonso J. Cervantes, Office of Mayor, 18 June 1968. Cervantes, S1 B61, University Archives, Department of Special Collections, Washington University Libraries; Press Release from Mayor Alfonso J. Cervantes, “For Release: Thursday, March 28, 1968-11 a.m. Cervantes, S1 B61, University Archives, Department of Special Collections, Washington University Libraries
⁵ John D. Parkhurst, Report on Status of Technology in the Recovery of Resource from Solid Wastes (Districts of Los Angeles County, California: County Sanitation, 1976), 29;Robert Christman, “City
Like most kinds of RDF, it was much less complicated than the other most promising resource recovery technique, pyrolosis. According to the mayor, it was “so simple” that “his first reaction was, ‘Why hasn’t someone else done it? That would have been done a long time ago if it were possible.’” The mayor was right; even of all the methods of producing RDF, St. Louis did initially have the simplest. The Ames, Iowa plant, which would model itself after St. Louis, separated the noncombustible material before burning. To some of the Ames engineers, years later, this step would distinguish their resource recovery plant from being just an incinerator or waste to energy facility. But St. Louis and Union Electric were planning their method before the ideological divergences about technological waste disposal had begun and even before the federal government started talking about “resource recovery.” This approach to a ubiquitous environmental problem, which would later be accused of ties to big business and being symptomatic of a blind faith in technology, was almost squashed by a Republican president.

**The Friend of My Enemy**

There would be less than a dozen resource recovery demonstration plants, although many resource recovery and other waste disposal processes received some kind of funding to perform tests or add pollution controls. Initially, however, there were supposed to be many more. The 1970 Resource Recovery Act (RRA), an amendment to the Solid Waste Disposal Act of 1965, allotted $463 million to demonstration plants and other technology related to solid waste utilization. Additionally, a survey of disposal sites in the United States, funded by the 1965 act, had led to the EPA’s 1970 Mission to Seek Grant for Trash Experiment,” St. Louis Post-Dispatch, 12 April 1970, 14A; Stroud, “A Plan to Convert.” 6A

6 Stroud, “A Plan to Convert,” 6A
5000 plan that had the goal of closing 5,000 dumps across the country. These closings meant cities needed to find new, usually larger, sanitary landfill sites or some other trash solution.

The author of both pieces of garbage legislation was the Democratic vice-presidential candidate in 1968 and almost Richard Nixon’s opponent in the 1972 election. Edmund Muskie, a Senator from Maine, was expected to beat George McGovern in the Democratic primary until a letter to a New Hampshire newspaper accused Muskie of calling the state’s French-Canadian population “cannocks,” an accusation which led to name-calling and a “breakdown,” which significantly hurt Muskie’s image. Historian Peter Carroll has suggested that the incident might have been the result of a “Republican ‘dirty tricks’ campaign.” After that debacle, Muskie lost his standing and McGovern went on to win the Democratic nomination.

Muskie had been a concern in the formation of Nixon’s environmental policies for awhile, however. The Administration commissioned several studies to gauge how the American people felt about the environment and Nixon’s policies toward it. Presidential adviser Pat Buchanan wrote in the letter accompanying the survey that, “Muskie accuses the President of being ‘slogan rich and action poor,’ of his ‘rhetoric taking us in one direction while his actions take us in another.’” At a time when environmentalism belonged to no party and pundits perceived it as having “no negative side,” politicians wanted to claim the issue and the momentum it was generating. GOP pollster Robert

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7 “One-Third of 5,000 Open Dumps Gone,” The American City, December 1972, 18.
Teeter advised the president that, “it is also important that a number of Republican
Senators, Congressmen, and other Republican office holders begin to be identified with a
strong position on this issue so that we don’t leave the field open to the Muskies,
Nelsons, Proxmires, Harts, Mondals [sic], and so forth.”10

Nixon had held the RRA at bay two years before the 1972 election, however,
possibly because of his political relationship with Muskie or possibly because the $463
million funding was much more than he had requested for the same purposes. Congress,
which had unanimously passed the measure in both houses, expected a pocket-veto of the
bill, and Muskie had prepared a speech “strongly criticizing” the president. But, on the
last night before a pocket-veto would take effect, after a dinner with Romanian President
Nicolae Ceausescu, Nixon surprised Muskie and his colleagues by signing the act into
law.11

This bill provided St. Louis its first $800,000 to build its demonstration plant
after the earlier study had deemed it possible and desirable. The city’s contribution was
$600,000, which Union Electric paid. Despite acquiescing to the act, solid waste would
remain, as one member of the administration called it, “our big clunker,” in a presidency
of unprecedented environmental action.12 The most scandalous incident occurred when

10 Bob Teeter Memorandum to Bill Ruckelshaus (No date but part of 12 May 1971 summary
package), 3, Nixon Presidential Materials Project White House Central Files, Staff Member and Office
Files, John C. Whitaker, Box ?? “Environment” Supplement, The Washington Daily News, Tuesday,
March 9, 1971 – Environment, General, 1973 (from OA 8142) [1 of 3-3 of 3]. Folder Environment
General—1971 (2 of 3), National Archives College Park Maryland.
11 Richard Nixon, “For Release upon Delivery to the Senate or the House of Representatives,” 10
February 1970, 9 Nixon Presidential Materials Project White House Central Files, Staff Member and
Office Files, John C. Whitaker, Box 58, Folder Environmental Message 10 February 1970, National
Archives College Park Maryland; E.W. Kenworthy, “$463 million Resource Recovery Act is Signed,”
Houston Chronicle 28 October 1970, 10 Section 7.
12 Christopher DeMuth Memorandum for John C. Whitaker, “1971 Legislative Program,” 4 June
1970, 6 Nixon Presidential Materials Project White House Special Files Staff Member and Office Files,
John D. Ehrlichman, Box 43, Special Subject File.
Nixon’s staff circulated a study from his Council on Environmental Quality’s 1972 report with the chapters on energy and solid waste in absentia. The timing of the report, during an election year, made politicos suspect of the oversight. Presidential hopeful McGovern said that the administration had “(put) itself in the absurd position of not wanting to receive completed studies that one of its own agencies was trying to submit.”\(^{13}\) Others thought the situation was more than “absurd.” After reading the report, which turned up almost immediately after it was noted missing, Indiana Senator Birch Bayh wrote EPA director Russell Train and stated,

> the matter of recycling receives surprisingly little attention in the Report, and the economics of recycling are not touched on at all. The glaring absence of this important material from the Report lends strength to the allegations that certain material was deleted. It seems to me that the Report’s failure to discuss and analyze the crucial issues of energy and recycling is inconsistent with the Congressional mandate for the Annual Report. Can there be any question that the discussions of energy and recycling are essential to the ‘social, economic and other requirements of the Nation?’\(^{14}\)

The skepticism was based on experience. A year earlier a chapter written about the inner-city environment had been “suppressed,” because as the president’s assistant director stated, “In its present form, it could very well come back to haunt us.”\(^{15}\)

The 1972 report had not addressed Congress’s concerns, because the administration was planning to ease out of the solid waste plans. The RRA authorized


$140 million in demonstration project funding in the 1973 fiscal year, but in his budget Nixon only asked for $23.2 million. That number shrunk to just $5.8 million the next year when the budget was supposed to be $238.5 million, and little of that was meant for MSW, most of it, instead, going for hazardous waste control.\textsuperscript{16} The EPA reduced its request from $25.5 million in 1972 to a little over $10 million the following year.\textsuperscript{17} The cuts angered many in Congress, and the Democratic Senator John V. Tunney from California accused the EPA of having “arbitrarily limited” the “landmark” legislation.\textsuperscript{18}

\textit{The American City}, whose readership included city officials all too familiar with the hassle of dealing with solid waste, said the problem was EPA’s director William Ruckelshaus, who it said, “is an attorney, a very able one. But his experience in solid waste disposal is short.” The article went on to advise the director that, “It is OK to talk to think-tank people…and often fun,” but that would not substitute for practical experience. “You get industry interested, and the general public,” was the magazine’s solution.\textsuperscript{19} An article in \textit{Audubon} entitled, “Nixon Administration Trashes Federal Solid Waste Program,” argued that the slight was political, saying that the Republicans were trying to hurt “Democratic city governments” by making them handle the most unpopular issue of waste disposal without federal assistance. The article noted that the “ratio of federal expenditures for pollution control was about $10 for water to $1 for air to 20 cents for solid waste.”\textsuperscript{20}

\textsuperscript{17} M. Freivogel, “Recycling Backpedals Economically,” \textit{St. Louis Post Dispatch}, 23 January 1973
\textsuperscript{18} Ibid.
\textsuperscript{19} “…such a primitive solid-waste system?” \textit{The American City} December 1972, 8.
\textsuperscript{20} Soucie, “Nixon Administration Trashes” Federal Solid Waste Program,” 118
While Nixon had political reasons to oppose resource recovery funding, his views on trash were interesting because of the ideological shifts that would unfold about technology in the environment in the next thirty years. The Union Electric plant demonstrated how politics were only one part of the situation. The plant had been supported by a Democrat-sponsored grant in 1970, which led to a $70 million local plan four years later with the cooperation of a Democratic mayor and a mammoth utility. In the next two years it would be local, largely Democratic aldermen who would hamper construction of the plant because of the Not-in-my-backyard (NIMBY) protests of their constituents, and a liberal policy that regulated utilities put the final nail in the plant’s coffin.

Nixon’s views on garbage would not fit neatly into a singular path either. It is possible he just thought the subject was too mundane or beneath his office. Buchanan had told him that, “The President of the United States should not be talking about how to get abandoned Chevrolets off the highway, or what is the amount of sewage the Potomac can take; or how much phosphate there should be in a box of detergent. Stay on the high plane to the degree we can.”21 Garbage was not typically a subject discussed on a “high plane,” although the president had once given it his best shot. A year before Buchanan’s advice, in an environmental message to the Senate, he suggested that the government apply the “kind of thinking” of the country’s space program “more consciously and more broadly to our patterns of use and disposal of materials here on earth.”22 Even the name of the EPA’s early solid waste plan, “Mission 5000,” reflected a lofty perspective of garbage in the space age.

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21 Buchanan, “Memorandum to the President,” 1.
22 Nixon, “For Release upon Delivery to the Senate or the House of Representatives,” 9. NASA even performed its own solid waste research in the 1970s. (See Chapter 3).
In the same statement Nixon emphasized strategies that would become the mantra of environmentalists and cities struggling with solid waste issues two decades later, “reusing and recycling.” Reflecting a conservationist mentality, but not necessarily one that businesses would support later in the decade, he criticized packaging methods and non-returnable bottles and wanted disposal costs factored into the price of products.  

Although resource recovery opponents would emphasize these same strategies later in the decade, Nixon’s reasons were not anti-resource recovery as much as they were anti-market-tinkering. Despite his funding slashes, he felt there should still be enough support to “provide a sufficient range of technologies that can be picked up by municipalities if they have markets for the recovered materials,” according to his “Meet the Press Briefing Book. “In addition, the existence of these technologies will be an incentive to the private sector to continue development of other systems which may be cheaper or more effective.”

In the country’s first resource recovery demonstration grant, that is just what happened.

**Union Electric Digs In**

As municipalities, universities, and businesses across the country began to undertake resource recovery projects, the word spread to local citizens relatively slowly. Quite a few citizens reported to St. Louis officials that they had read in the newspaper about some city—Los Angeles or San Diego—that was using a high-tech method to recycle their city’s garbage and that St. Louis ought to consider such a venture. One man

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24 Hank Paulson (he sent it, but Jim Falk or Pat Buchanan seem to have written this part—picture 6741) Memorandum for John Ehrlichman, “Briefing Book,” 7 February 1973, Nixon Presidential Materials Project White House Special Files Staff Member and Office Files, John D. Ehrlichman, Special Subject File, Box 43, Folder “Meet the Press Briefing Book.”
from Lowell, Indiana, sent “the Mayor” a copy of two articles from the Detroit Free Press about a Detroit inventor, who had made his own resource recovery plant, an “800-gallon vat” in his backyard, “into which he shovels coal, bowling pins, table scraps, leaves and grass clippings and out of which he draws pure, high octane gasoline.” The Hoosier wrote that, “I am sending copies of these to the Mayors of many cities throughout the country on the assumption that they may be unaware of them.”²⁵

Local businesses were more aware of the plant. As it became more established, the Union Electric facility became incorporated into the region’s material flow. By burning the garbage in the utility, the process had a guaranteed market for its energy, and Granite City Steel Company took advantage of the demonstration plant’s newly sorted steel cans and contracted with the city to buy 3,750 long tons of reclaimed cans for a minimum per ton cost of $20.²⁶

Although Union Electric had hosted and co-sponsored the demonstration grant, no further obligation was required from either the city or the utility. After the project was over, Union Electric was free to drop out and St. Louis was free to pursue any other waste disposal prospects. As the project went on and Union Electric proved the possible lucrativeness of resource recovery in the city and observers saw that St. Louis was an area that could work well with a resource recovery facility, the city received numerous reports and letters from companies with names like Sira International Inc., Systems Associates, Wemco, and Devco telling about their resource recovery proposals. In

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²⁵ Frederick K. Barker (Lowell, Indiana) letter to the Mayor, 23 November 1973, Poelker S1B47, Streets, Garbage and Rubbish Collection April 1973, University Archives, Department of Special Collections, Washington University Libraries.

October, 1973, the city had two formal offers to operate its disposal system. A business had to spend a great deal of time and money investigating a city’s solid waste infrastructure, before getting its foot in the door of City Hall.

Devco started researching early in 1973, even going so far as to arrange financing with the First National City Bank of St. Louis. The New York based company had been contacting St. Louis regularly, asking for a chance to demonstrate its pyrolysis technique to the mayor or the city’s sanitation department. The Devco System cost $9.5 million with an additional operating cost of $5.50 per ton. In November company officials again requested a meeting with city officials. Someone in now-mayor’s John H. Poelker’s office attached a note to the request asking, “Mayor, Isn’t this the proposal that we decided not to pursue?” To which the mayor responded, “This is a black-owned firm, and I feel we should keep in touch. Perhaps (Solid Waste Commissioner Wayne) Sutterfield could talk to someone at D.&P. to get an idea of their operations.”

St. Louis, like other cities, had experienced strikes and class tensions between its garbage men, most of whom were black, and other citizenry, who consider themselves more cleaner and generally more civilized.

Sometime between that letter in November and the end of February, Devco got its chance to pitch its idea to the mayor. The company felt the presentation was fairly successful, and perhaps, it was—successful enough to scare Union Electric into finally

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28 Deighton O. Edwards Jr., letter to Honorable John Bass (Comptroller) 5 March 1974, 1, Poelker S1B47, Streets, Garbage and Rubbish Collection April 1973, University Archives, Department of Special Collections, Washington University Libraries.
29 Memo from “Lou” to Mayor 7 November 1973, Collections Poelker S1B47, Streets, Garbage and Rubbish Collection April 1973, University Archives, Department of Special Collections, Washington University Libraries.
30 Ibid.
committing to a permanent plant. The February 28 announcement that the company was going to build a full-scale version of the demonstration plant must have come as quite a shock to Devco. On March 5, the company sent a letter to the city, mentioning their visit and offering to work with Union Electric, so the utility company would not have to “handle and process waste.”

Union Electric insisted that the only way the venture could be profitable was that if it handled the entire process. Perhaps, as Carroll argued about Nixon’s support of black businesses, “the age of small business had long since vanished from the land and black enterprise, no matter how vigorous, had little chance of penetrating the corporate mainstream, much less altering the pattern of economic relations dominated by huge conglomerates.” The newcomer had little chance against the established giant once the giant made up its mind. For politicians, the voter appeal of having a technologically sophisticated waste disposal facility operated by African-Americans could not trump Union Electric’s offer to build a $70 million plant, at its own expense, and to take over the area’s complete waste disposal operations.

There were economic, as well as political and environmental reasons for Union Electric’s monumental plan. The company had existed in St. Louis since the beginning of the century. It experienced its greatest growth when electrical use soared in the 1950s and 1960s, and by 1965 was worth over a billion dollars. At that time the company enjoyed an especially cuddly relationship with the city led by Mayor Cervantes, who wrote the Union Electric president in 1967, saying, “We in Saint Louis are extremely

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31 Deighton O. Edwards, Jr., letter to Honorable John Bass (Comptroller) 5 March 1974, Poelker S1B47, Streets, Garbage and Rubbish Collection April 1973, University Archives, Department of Special Collections, Washington University Libraries.

32 Carroll, It Seemed Like, 47.

proud of your company and the leadership you are exhibiting in promoting our exciting city. You and Union Electric are to be commended by your many examples of leadership. My hat is off to you.”34 The company even “loaned” its chief development advisor to the city to head up the Municipal Business Development Commission until they found a permanent person. If Cervantes had a vision for “his incinerator,” as one of his staff called it, he was probably pleased the local powerhouse was on board with it.35 During the pilot project, the mayor said the company had been “ideal to work with.”36 By the time the demonstration plant had successfully run its course, St. Louis had a new mayor, John H. Poelker, also a Democrat. Poelker supported the Union Electric plant and counted on it to provide the solution to the city’s potential solid waste woes, but it was not “his incinerator.” His willingness to entertain Devco’s proposal illustrated his flexibility on the issue. As the politics of trash and utilities unfolded across the country and in his city, Poelker would not have the political capital or the close relationship with Union Electric to push the plan through.

While Union Electric may have been slow to reveal its decision, the scale of the proposal was colossal. Instead of handling just 35% of the waste from the city of St. Louis, the full-scale $70 million plan would take all of the trash from St. Louis and its six neighboring counties in Missouri and Illinois. The 2.5 to 3 million tons of waste

34 Letter from the Mayor (Alfonso Cervantes) to Charles J. Dougherty 11 July 1967, Cervantes S1B62, Union Electric, University Archives, Department of Special Collections, Washington University Libraries.
35 “Press Release from Mayor Alfonso J. Cervantes,” 8 June 1967, St. Louis Cervantes S1B62, Union Electric; Gary W. Ferguson memo to Bob (don’t have last name) 12 February 1973, Cervantes S2 B78 Streets-Garbage and Rubbish Collection, April 1, 1969, University Archives, Department of Special Collections, Washington University Libraries.
36 Stroud, “A Plan to Convert” 6A.
collected annually was to supply 6% of the company’s power output.\textsuperscript{37} Officials in the areas surrounding St. Louis were pleasantly surprised by the announcement. One of the county supervisors said the news was “the solution to the solid waste disposal problem that we have been searching for.”\textsuperscript{38} While inside St. Louis, the \textit{Post-Dispatch} hoped the project would be “a financial as well as an environmental success.”\textsuperscript{39}

The new plan used the same process as the demonstration plant. During the demonstration run, the project managers added an air density separator, which helped separate the non-ferrous, non-combustible materials from the rest of the waste stream. This effort was not to aid the recovery of resources but to prevent mechanical jams; the company sent unsorted material to a quarry.\textsuperscript{40} Aside from this change, the only major differences between the scale up and the original were the addition of a second RDF boiler at the company’s Labadie plant in Franklin County, southwest of St. Louis, and Union Electric’s intent to “establish five, six, maybe seven, strategically located collection and transfer stations,” which had to be next to arterial highways and railroads.\textsuperscript{41} Union Electric insisted that the system “be built, owned and operated,” by its subsidiary, the Union Colliery Co. The pilot plant had generated income through dumping fees, materials recovery and, of course, as a source of fuel, so the company was expecting the same from the scale-up. Additionally, Union Electric President Charles

\begin{footnotes}
\footnotetext[38]{Swayzee and Stith, “UT Plan.”}
\footnotetext[39]{“UE’s Trash Plan,” \textit{St. Louis Post-Dispatch} 2 March 1974.}
\footnotetext[40]{Parkhurst, \textit{Status of Technology}, 31.}
\footnotetext[41]{Charles J. Dougherty on Bob Hardy, “For Your Information,” Radio Station KMOX 1 March 1974 2, 3 Poelker, University Archives, Department of Special Collections, Washington University Libraries.}
\end{footnotes}
Dougherty required two conditions: a guaranteed waste stream and “realistic environmental regulations for refuse-burning boilers.”

The waste stream was unlikely to be a problem. The state of Missouri was producing over four million tons of waste a year, and of the 457 landfills in the state, only one percent of those were meeting new disposal standards. The *Post-Dispatch* called the state report of burning and leachate offenses a “catalogue of trash horrors.” And while environmental regulations would eventually come to haunt resource recovery endeavors, in many ways utilities considered them a solvent initially. Not only did Union Electric’s plan have the overall environmental benefits of saving land and conserving natural resources, it saved the pollution that burning coal would have produced. Perhaps most importantly, when co-fired with coal, garbage absorbed sulfur dioxide that otherwise would be released into the atmosphere.

**Solving Pollution?**

Union Electric had not met Missouri’s pollution standards since the state first implemented clean air laws in 1967. Two years after the company reached its billion-dollar property mark, it invested about $10 million in air pollution control. In 1968 the company installed an electrostatic precipitator, commonly called a “scrubber,” at the Meramec plant. The device did not eliminate enough pollution to satisfy the law, and the company used the failure to argue that scrubber technology either did not work or was still in an experimental stage and not yet perfected. Three doctors testified for the

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company before a commission on Missouri Air Conservation Regulations. They testified that the “goals for the sulfur dioxide were unduly restrictive and unrealistic since they are probably not feasible of attainment.” One doctor said, “based on any defensible standard, there is considerable doubt if the Interstate area has a sulfur dioxide problem.” The main result of sulfur dioxide emissions is acid rain. As that issue increased in notoriety, the company shifted its arguments away from the health issue and toward practicality.

As time went on and the state environmental agencies continued to let Union Electric’s violations pass, local environmentalists became more agitated. Ben Senturia Jr., Vice President of the St. Louis Coalition for the Environment, said that, “We have direct evidence that emissions from St. Louis power plants not only have an impact on our city … Chicago officials have indicated to us a concern over this effect because of elevated sulfate levels in Chicago (sulfur dioxide converts chemically to sulfate in the atmosphere.) It seems clear that Union Electric sulfur emissions are increasing, to some degree, the sulfate levels in Chicago.” The environmental group’s claim was based on the strictness of Illinois’ pollution standards compared to Missouri’s and the state’s lenient enforcement.

It was not until 1976 that the company’s vice president conceded that, “it can no longer be accurately stated that (scrubbers) don’t work.” He added, however, that “How well they work is quite variable among different plants.” The company also continued to argue that the expense did not justify the result. They claimed that to meet the

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45 “Effect of Missouri Air Conservation Regulations.”
47 Shirk, “Easing of State.”
Missouri laws “would cost more than it is worth” and could cost as much as half a billion dollars. 48 An incredulous Post-Dispatch responded to the claim: “How does Union Electric explain the presence of sulfur dioxide removal equipment on scores of electric power plants around the country?” 49 “Scores” might have been an overstatement, but utilities across the country were beginning to accept their fate. By 1973, twenty-four companies had installed scrubbers in forty-four different plants across the country. Those numbers increased to fifty companies and 119 plants by 1977. The state’s financial estimates were much more modest than Union Electric’s, and they predicted the new devices would cost $30 million. 50

In The Sanitary City, historian Martin Melosi discussed the government’s approach of “technology-forcing,” or applying “technology-based standards” to ameliorate pollution problems. He explained how the policy was good for “engineers, contractors and equipment manufacturers,” but not necessarily for businesses or the EPA. Businesses were reluctant to invest in the obsolescent technology and the EPA had a hard time making them install devices, which they might argue they could not afford to obtain or utilize. 51

The Nixon administration believed the problem lay with states that would not allow utilities to include research and development in their rate base. Unlike most other businesses, utilities had comparatively limiting economic restrictions. In 1970, only

twenty-two states allowed their utilities to charge customers for research and development, and this, the administration said, “was a substantial increase over the situation several years ago.”\textsuperscript{52} Nixon was torn between what he called “jawboning,” or persuading, state officials and requiring by federal law that utilities be allowed “reasonable R&D costs” and automatic increases for any pollution control investments. Jawboning with the threat of federal action won the day, leaving states with discretion to govern their utilities but the prodding of the administration to encourage the utilities to meet clean air standards.\textsuperscript{53}

Other options could have included taxing emissions violators and using the money for a federal research and development program or taxing all utilities and offering rebates to companies that implemented successful air pollution controls. Advocates of these approaches were concerned that allowing utilities to raise rates for their own research and development would lead them to experiment with technology that improved their productivity rather than solving environmental issues. Lee DuBridge, Nixon’s Director of the Office of Science and Technology, said that drew a false dichotomy between productivity and the environment. “They have much in common,” he said. “One of the surest means of reducing pollution is improving the efficiency of power production and thereby reducing effluents per unit of output as well as conserving our non-renewable resources.”\textsuperscript{54}

\textsuperscript{52} “Electric Utilities Issues,” (In folder with 4 June 1970), 2. Nixon Presidential Materials Project White House Special Files Staff Member and Office Files, John D. Ehrlichman, Box 43, Folder Special Subject File


\textsuperscript{54} Lee A. DuBridge, Director of the Office of Science and Technology Memorandum for Mr. Christopher DeMuth, (an answer to DeMuth’s response to energy tax) White House Staff, 13 July 1970, 1 Nixon Presidential Materials Project, White House Central Files Staff Member and Office Fileds, Edward E. David, , OST-White House Files, Box 8, Folder White House-Energy 1969-1970.
This reasoning would not prove true with the Union Electric Company, which spent the 1970s raising rates drastically to improve productivity without coming closer to meeting the state’s environmental goals. The Missouri law required that by 1970 large utility plants had to reduce their emissions of sulfur dioxide to 2.3 pounds per million Btu heat input. The company interpreted the law, stating that “There are only two ways to comply with this regulation: a. Use 1.4% sulfur coal b. Remove sulfur dioxide from the flue gas.”55 Even before the Energy Crisis, the company predicted that the low sulfur coal would be too expensive, raising the price of their seven million tons of coal per year by $14-$28 million. After 1973 when cities across the country switched from petroleum to coal, that price soared higher. It seems reasonable to assume that in solid waste disposal, Union Electric saw a new way to meet the requirements of the law. Refuse had ten percent the amount of sulfur as low-sulfur coal. If refuse replaced 6% of the company’s power needs that would help put somewhat of a dent in the plant’s emissions. Additionally, it was soon discovered that in a co-fire system like the St. Louis RDF plant, in which coal and refuse were burned together, the sulfur would stick to the waste ash from the trash. So rather than blowing out of the stack, the sulfur could be managed with the other ash.56

Just like nuclear power, which the company was also pursuing, RDF was a new technology that might help ameliorate troubles with old technologies. Not everyone in the country was happy with this kind of technological optimism. Most Americans still believed in progress, but as signs of environmental degradation grew, fears about

resource limits and technological shortcomings were also starting to creep into the American psyche.\textsuperscript{57} There was one St. Louis resident who would do more than anyone during the next three decades to make sure Americans paid heed to those fears.

**The Local Scientist-Activist**

Perhaps one of the most interesting points about the St. Louis plant is that the NIMBY protests that resulted from it were not based on the plant itself, but on a transfer station. As one alderman stated, “Most people said, ‘Yes it’s a good thing, but we don’t want it in (our neighborhood).’”\textsuperscript{58} The transfer station was only to hold collected trash for a brief time until it was transferred by railcar to the resource recovery plant. There was no immediate threat of sulfur dioxins or other pollution resulting from technology to worry about. Instead, it was a more natural danger that concerned the residents, “Rats!”\textsuperscript{59} The fear was not unjustified. As historian Andrew Hurley has pointed out, “A rule of thumb for the recent twentieth century has been about one rat per person. In St. Louis during the early 1940s, however, the number of rats was estimated at 1.8 million, or roughly two rats per person.” The ashpits where people stored their waste particularly attracted the rodents.\textsuperscript{60}

The city and its residents, though, were better versed in invisible environmental threats than most Americans. In 1958, St. Louis was one of six cities chosen by the U.S. Public Health Service, the same agency that would fund the city’s solid waste study ten years later, to test the level of the radioactive isotope Strontium-90—“fallout” in lay

\textsuperscript{57} For more information on the tensions between America’s optimism and worries about the environment see Donald Whisenhunt, *The Environment and the American Experience: A Historian Looks at the Ecological Crisis* (New York: Kennikat Press, 1974).

\textsuperscript{58} Jerri Stroud, “UE Trash Plant Site is Rejected in Fenton,” *St. Louis Post-Dispatch* 18 May 1976.

\textsuperscript{59} Jerri Stroud, “Opposition on South Side to UE Facility for Trash,” *St. Louis Post Dispatch* 4 September 1975.

terms—in its milk. The report was too technical for most people to understand, so a group of scientists, including Washington University professor Barry Commoner, formed a group to disseminate the scientific information to the public.

The response was instantaneous—and overwhelming. When it became known that scientists were willing to try to explain the fallout problem, we were besieged with questions. We had to assure citizens that the white spots on their lawn grass were mold, not fallout; that there was no conceivable way to save the world by extending the half-life of radioactive atoms. And every lecture led to demands for more. Many of us became heavily engaged in the community’s lecture circuit: PTAs, Lions, Rotarians, forums, television interviews. We discovered religious denominations and parts of our city that we never before knew existed.”

Even more than the threat of fallout, Commoner and his fellow scientists were worried about the way the federal government was using scientific opinion to support technological advances, especially in the field of nuclear power. Commoner, a biologist, was specifically concerned that the fields of physics and chemistry had outpaced biology in the 20th century, causing humans to rush into new technologies made possible by the first two fields without knowing the effects on life that biological knowledge would have exposed. The root of this problem, he said, was the division between classical biologists like him, who looked at life holistically in the study of whole organisms, and molecular biologists who broke life down to molecules with their reductionist approach.

Commoner argued that, while neither science was complete on its own, the popularity of molecular biology was too narrowing. “Too often, today, we fail to perceive this system as a complex whole,” he said. “Too often has this blindness led us to exaggerate our power to control the potent agents which we have let loose in the environment.”

62 Ibid., 30-46.
63 Ibid., 46.
Commoner wanted the proliferations of new technology to slow down until scientists could start to study any risks they might entail.

The same year as the milk study, Commoner joined with other scientists and citizens worried about nuclear technologies to form the Committee for Nuclear Information (CNI). After a scholarly article came out about Strontium-90 traces in bones and teeth, CNI scientists decided to capitalize on parents’ interest in the relationship between radioactivity and their children’s health in order to gather evidence for their research. They asked parents and children to contribute to the Baby Tooth Survey. In St. Louis, instead of the tooth fairy collecting teeth, it was the CNI, and by 1966 they had received over 200,000 contributions. Commoner believed that involving citizens in the project, especially mothers, and deciphering complicated and conflicting scientific opinions had a major effect on the country’s nuclear policy. “Many people were surprised at the ease with which the 1963 test-ban treaty was approved by the United States Senate,” he wrote. “Several observers have noted a possible connection with the numerous letters received by Senators from housewives and mothers who not only wanted the treaty approved but could cite serious scientific grounds for their belief that it would help reduce the medical hazards from fallout.”

Although Commoner’s career as a citizen-scientist initially focused heavily on nuclear issues, as we will see, for over thirty years he would do more than any other scientist to make Americans give pause about resource recovery, and later waste-to-energy, projects.

Commoner believed in cybernetics, a philosophy of systems that became especially popular after World War II, thanks to the “inventive mind” of mathematician

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64 Ibid., 120.
Norbert Wiener. Many people in different fields, ranging from ecology to computer science, believed in cybernetic principles. The theory involved using a kind of bird’s-eye view to evaluate a situation, which its practitioners saw as a system. Even if one part of the system seemed far-removed from another part, they would still be connected through, what cybernetic-ians called “feedback loops.” Because these loops were not always immediately apparent inside the situation, one needed to look at the system as a whole from the outside. The biologist said that the “simple fact about ecosystems” was that

Everything is connected to everything else: the system is stabilized by its dynamic self-compensating properties; these same properties, if overstressed, can lead to a dramatic collapse; the complexity of the ecological network and its intrinsic rate of turnover determine how much it can be stressed, and for how long, without collapsing; the ecological network is an amplifier, so that a small perturbation in one place may have large, distant, long-delayed effects.

Cybernetics fit well with Commoner’s beliefs about classical and molecular biology. Classical biology which looked at the whole cell or the whole organism rendered more complete information than molecular biology, he argued, which only looked at one part of the cell. Applying a cybernetic framework to a situation could reveal emergent properties that one could not see studying each part individually.

The holistic thinking that included cybernetics and systems did not inherently entail a skepticism about technology. As Peter Taylor wrote, “The new theories about feedback systems were liberating for arms race enthusiast John Von Neumann, and alike for humanists such as (G. Evelyn) Hutchinson, Margaret Mead and Gregory Bateson.”

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66 Ibid., 39.
67 For more on Commoner and the divide between classical and molecular biology see Donald Fleming, “Roots of the New Conservation Movement,” Perspectives in American History, 6 (1972), 7-91.
The skeptics believed in a “social lag” between science and society that prevented the wisest application of science just the way Commoner believed a lag time between the fields of chemistry and physics and the field of biology was leading to an irresponsible use of technology.  

It is worth noting that Commoner is not an ecologist even though he became known to the public as one. This is likely in part because of the “informal set of ‘laws of ecology’” which he laid out in his book *The Closing Circle: Nature, Man and Technology*. These laws reveal his systems thinking, his technological skepticism, and the foundation of his views on resource recovery: 1. Everything is Connected to Everything Else; 2. Everything Must Go Somewhere; 3. Nature Knows Best; 4. There is No Such Thing as a Free Lunch. Keeping in mind that the aims of resource recovery were equally weighted between the local goal of eradicating piles of solid waste and the conservationist goal of saving natural resources, one can understand the potential conflicts between the high-tech solution and laws two and four. Commoner considered ecology the “science of planetary housekeeping,” and technology had to be used responsibly in the planetary home. To paraphrase what he once said about atomic technology, one does not need to use a cannon to kill a fly—especially in one’s house.

To cities considering resource recovery, its best feature was that it made garbage disappear. Commoner and some other groups of environmentalists opposed this kind of localized thinking. Commoner used the example of a battery that was tossed into the trash and taken to an incinerator. The garbage collector removes the problem from the

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69 Ibid.
consumer, and the incinerator removes the problem from the city. “But where does it really go?” he asked. When it was burned, the mercury in the battery formed toxic mercury vapor. As the view expanded and the entire system was taken into account, one could see what would happen to the tossed-out battery. He wrote that the

Mercury vapor is carried by the wind, eventually brought to earth in rain or snow. Entering a mountain lake, let us say, the mercury condenses and sinks to the bottom. Here it is acted on by bacteria which convert it to methyl mercury. This is soluble and taken up by fish; since it is not metabolized, the mercury accumulates in the organs and flesh of the fish. The fish is caught and eaten by a man and the mercury becomes deposited in his organs, where it might be harmful. And so on.\(^\text{72}\)

As Commoner stated, each of the first three laws led to his concluding law that there is no free lunch. Commoner held a particular world view that “every gain is won at some cost.”\(^\text{73}\) This was a holistic view, but not one shared by the technocratic optimists, who believed that technology could expand the system. For Commoner and environmentalists who thought in a similar vein, unfettered consumption and development of technology could not go on indefinitely or maybe even for very long. Whether or not society knew all the hazards that existed between its progress and its lagging knowledge, the hazards were there and would have to be faced at some point.

Although all of these ideas were fermenting in the mind of a leading St. Louis scientist, who had successfully educated the public about radioactivity and, in doing so, encouraged citizen-activism, the debate about technology and the environment did not appear to have had a major impact on the Union Electric plant. The “free lunch” argument did have a place but instead of being about consequences to the environment on

\(^{72}\) Commoner, *Closing Circle*, 40.
\(^{73}\) Ibid., 46.
a planetary-systems scale, it centered on localized neighborhoods full of citizens who
wanted solid waste disposal, but not in their own back yards.

**NIMBY and PIBBY in St. Louis**

The proliferation of garbage that occurred in the post-war years made the spread of waste disposal locations inevitable. In 1970 there were approximately 12,000 “authorized dumps” and many more unauthorized ones. It was the visible accumulation of garbage that encouraged Lady Bird Johnson to push for the first trash legislation, the Highway Beautification Act, in January 1965. Litter was everywhere and Americans began to feel that they were being “engulfed” by an “avalanche of garbage.” Of course America’s unprecedented affluence contributed to the trash pile-up, as did the prevalence of plastic. Changes in waste disposal options, however, were the biggest contributors of the mounting trash. Between 1953 and 1955 400,000 pigs were killed because of a vesicular exanthema epidemic that spread from feeding them uncooked garbage. Subsequently, states outlawed the practice. The Clean Air Act of 1970 banned the other most popular disposal method, open dump burning, which greatly reduced piles of waste. As Judd Alexander, the Vice President of the American Can Co. said, “We are not running out of holes in which to put our garbage; we are just running out of cheap, well-located holes.”

Although a main benefit of the Union Electric plant was precisely to avoid having to site new landfills, something Melosi called a “treacherous business,” residents of St.

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Louis’s middle to upper class white south side did not want the rats, traffic, smell, lower property values, and overall blight that they feared a transfer station would bring to “the only decent place left in the city.”\textsuperscript{76} As south St. Louis Alderman Albert Holst argued, the area was already “footing the tax bill now, so why should we bring about this type of thing in south St. Louis.”\textsuperscript{77} Not-in-my-backyard or “NIMBY” has been a controversial term, which many people, including Commoner, have considered to be just an industry tactic that makes site resisters look selfish. But the term seems appropriate for the St. Louis residents, who exhibited a type of NIMBYism that sociologist Robert Bullard has labeled PIBBY, the “Place-in-Blacks’-Backyard” principle. Although this attitude has resulted in many unwanted projects moving into African-American communities, this was not an option for Union Electric, which had already planned transfer stations in three predominately black areas and argued that the economic success of its plan hinged on finding a suitable site on the city’s white south side. More than the gas, the cost of paying 300 to 400 haulers to drive ten to fifteen extra miles several times a day in the congested city would drive up the price of labor too much for the hauling companies.\textsuperscript{78}

Residents in the first three communities—Hall Street, in north St. Louis, near the Mississippi River; Lindbergh Boulevard in West St. Louis; and Washington Park, directly across the Mississippi from the city of East St. Louis—held no objection to the plans for transfer stations.\textsuperscript{79} According to historian Robert Gioielli, urban renewal in downtown forced African Americans to the north and west of the city. In the 1960s, he

\textsuperscript{76} “The Case for U.S. Plant Site Stinks,” (Editorial) \textit{South Side Journal} 25 September 1975.
\textsuperscript{77} Jerri Stroud, “Residents Skeptical Over Trash Terminal Plan,” \textit{St. Louis Post-Dispatch} 25 August 1975, Section 1S.
\textsuperscript{79} “Fenton is Ordered to Issue UE Trash-Plant Permit,” \textit{St. Louis Post-Dispatch} 9 October 1976.
wrote, “Racial turnover was quick, as whites fled for new suburbs in St. Louis County.”

Not all whites left the area, however, and at least some of those who remained blamed their new neighbors for bringing blight into their communities. One woman, living in a “highly integrated” area northwest of the city center wrote Mayor Raymond Tucker that her neighborhood had “taken on a slum appearance,” and was “just plain disgusting.” She had “come to the conclusion that there are two sets of (property) laws—one for the white residents and one for the negro; the ones for the white are to be adhered to strictly, and for the negro to be ignored and disobeyed.”

In 1975, Union Electric attempted to site its fourth transfer station in Carondelet Park, south of the city along the Mississippi River. The Carondelet residents formed a group called the South Side Citizen’s League, which planned “possible legal action against the utility or the city.” The Globe-Democrat wrote that the “ecological milestone” was a “local environmental disaster” for Carondelet residents, 4500 of whom signed a petition, protesting the site. That area of south St. Louis had been known as the “Scrubby Dutch” area, because of the immigrant Dutch population and their reputation for tidiness. Residents realized what Union Electric was doing before the company revealed their plans to the neighborhood when some “men drilling in that field across the street disturbed them. Someone asked the drillers what was happening. When they said Union Electric wanted to build a trash terminal there, the

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81 Agnes Downey Letter to Mayor Raymond S. Tucker, 3 December 1962, Tucker S3B40, Garbage and Rubbish Collection, University Archives, Department of Special Collections, Washington University Libraries.
Heated exchanges took place between white St. Louis neighborhoods and the Union Electric Company. St. Louis Globe Dispatch, 4 September 1975, 1A
residents were the first to react.” In the post-Watergate era, Union Electric’s stealth was suspicious. Some Carondelet residents believed the company had ties to Mayor Poelker, who was “running the city like Nixon.” While businesses were reading articles like, “Garbage Gets a Glamour Image” in Business Week and city leaders were reading, “Golf Courses from Garbage” and “Transfer Station Solves Waste-Disposal Problem” in The American City, to whites in St. Louis’s South Side trash was still something that did not belong in “a clean residential section.”

Bullard has written that even lower and middle class white areas have been better able to block locally unwanted land uses (LULUs) from their communities. In the case of the transfer stations, they might not have necessarily been unwanted in the other communities. Union Electric promised the Carondelet residents “earth mounds, depressed driveways and plant screenings,” and a row of 20-foot-high pin oaks. The garbage would be transferred in airtight steel containers, and all transactions would occur indoors. The Post-Dispatch wrote that, at a community meeting, “the audience snickered when (a Union Electric representative) said the company would build shelters at bus stops on the property. But he brought down the house when he said fountains might be provided as well.” Even without all of the amenities, University City, closer to the city center, was content with its transfer station, which had been running for five years.

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84 Jerri Stroud, “‘Scrubby Dutch’ Rally Against Trash Terminal,” St. Louis Post-Dispatch, 8 September 1975, 4S.
85 Ibid.
88 “Trash No Problem at U. City Center,” St. Louis Post-Dispatch, 17 September 1975, 16.
Considering the state of many poorer St. Louis neighborhoods, an enclosed transfer station would not have added much blight. Absentee landlords of heavily vacated neighborhoods left tenants to deal with “faulty plumbing, peeling paint and cracking plaster and insect and rodent infestations.”

Outsiders saw the city’s ghettos as “a world of rubbish,” as a Post-Dispatch reporter wrote:

What technicians and bureaucrats call solid waste is ubiquitous: There is litter on the sidewalks, garbage in the gutters, broken furniture in the hallways, derelict automobiles and dead washing machines in the yards, debris from demolished buildings in the vacant lots. It is a world, the suppressed EPA study points out, where a whole complex of problems conspires to defeat tidiness. Old buildings, cut up into small apartments, lack storage space so that what cannot be immediately put to use is discarded. What is discarded spills into the entryways and streets, and into the vacant lots whose owners often live, unconcerned, miles away.

The story also noted the “depressing” effect the unsavory conditions had on the residents.

The EPA study referred to the inner-city segment the Nixon administration dropped from its Council of Environmental Quality report, which investigated St. Louis, along with other major cities with ghettos.

In the ghetto a building that held completely contained waste for a period of less than 24-hours might possibly have been “an asset to the neighborhood,” as the project’s architect argued. White residents of south St. Louis, however, seemed to associate even their own garbage, which would be held at the transfer station, with the ghetto. Mrs. J.A. McMiller, president of the South Hampton Development League compared the Union Electric plans to the most infamous housing project in the city, and the country, saying “Pruitt-Igoe looked beautiful, too, when it was drawn on paper.”

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90 “Wonderful World of Rubbish,” 6A.
a time housed 10,000 black adults and children, was supposed to be a model example of public housing when it opened in 1954. Within five years, however, it “had become a community scandal.” Its wide hallways provided a gathering place for gangs and other criminals, while high vacancies contributed to its deterioration.⁹²

Several scholars have studied African-Americans and the environmental movement. Environmental groups began actively incorporating the environmental interests of African-Americans in the 1990s.⁹³ The Nixon administration studied these interests in the early seventies, asking Robert J. Brown, his “ambassador” to American blacks how the black population saw the pollution issue.⁹⁴ From his conclusions the Administration surmised that:

…the environmental issue is not a fad nor a middleclass issue—because the problems of pollution, urban decay and wasted resources are intertwined with hunger, poverty and psychological ills. The blacks have been turned off on this issue because the environmental issue has not emphasized lead poisoning, noise, overcrowding and inadequate housing—the problems that are familiar to the ghetto; Today, the poor and near poor bear the burden of environmental ills; they cannot leave the cities where the environment is getting worse. … If properly handled, the ‘environment’ could be a big issue with the blacks—as in the end they probably suffer most.⁹⁵

As Gioielli pointed out in his work in urban environmentalism, however, Nixon’s direct grant programs to the cities that replaced many Great Society programs often meant the

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⁹⁴ James K. Batten and Dwayne Walls, “Nixon Aide has Murky Past,” *St. Petersburg Times* 5 April 1969, 8A.
only source of environmental protection in black communities in the 1970s was local activism.  

Carrying on a nearly hundred-year-old dialogue about the incorporation of America, presidential advisor Teeter noted that all Americans struggled with “living in a complex urban society,” where they were “dependent on a multitude of institutions with which (they have) little or no knowledge and virtually no control.” This line of thinking would be shared by pro-recycling activists later in the decade. The residents in Carondelet also employed the rhetoric of powerlessness. Besides the David and Goliath comparison, between themselves and Union Electric, they linked Goliath to the city.  

“Why is it though that the big business interest usually emerges victorious in such instances?” one resident asked. “Isn’t the power divided equally or don’t people wield a big enough stick in the city halls and executive chambers? (The people) don’t seem to prevail even if their cause is just.”

Although the residents of south St. Louis suspected Mayor Poelker of being in cahoots with Union Electric, his involvement in the siting was minimal. He “refused” to oppose the transfer station, but he didn’t use any political pressure to sway the Democratic aldermen or the South St. Louis Young Democrats, who all organized against the transfer station, to help Union Electric. At one community meeting, two Democratic Aldermen, James Komorek and Richard Gephardt, told attendees to “put

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96 Gioielli, “Hard Asphalt and Heavy Metals,” 16.
97 Bob Teeter Memorandum to Bill Ruckelshaus (No date but part of 12 May 1971 summary package), 2. Nixon Presidential Materials Project White House Central Files, Staff Member and Office Files, John C. Whitaker, Box “Environment” Supplement, National Archives College Park Maryland
100 “Mayor Firm on Trash Station Site,” St. Louis Post Dispatch 12 October 1975.
“pressure” on the mayor to block the facility. Komorek said, “This is directly in the
mayor’s lap—we’re going to ask the mayor to back off.”\textsuperscript{101}

Ultimately Union Electric backed off and decided to pursue a new site in South
St. Louis, in Brentwood, northwest of Carondelet, almost directly west of Washington
Park. That effort did not last long as community leaders swiftly told the company that
their zoning laws would not allow the facility. After this defeat, Union Electric changed
its planned number of transfer stations from seven to four. The company, which was “in
bewilderment at the opposition,” started stressing the need for cooperation. One
spokesman talked about the “emotionalism about trash and garbage” and the “psychology
of being turned down.” He worried that, “Once one place says no then everyone else
says, ‘If they don’t want it, why should we?’”\textsuperscript{102}

\textbf{Women’s Thoughts on the High-Tech Solution}

While south side civic groups were organizing against Union Electric’s transfer
station, no one seemed to be opposing the resource recovery plant itself. Numerous
protesters said they were not opposed to the project only to the location.\textsuperscript{103} As one
reporter wrote, the plan may be a “salvation from solid waste problems, but salvation
may not look so good if it’s in your back yard.”\textsuperscript{104} For a time, resource recovery was
popular with civic groups across the country; perhaps its biggest supporter was the
League of Women Voters.

\textsuperscript{101} “South Side Group to Fight Trash Plan,” \textit{St. Louis Globe Democrat} 23 September 1975.
\textsuperscript{102} Margaret W. Feivogel, “Situation Wanted: Trash Compacting in South County,” \textit{St. Louis Post-Dispatch} 9 May 1976, 1.
\textsuperscript{104} Feivogel, “Situation Wanted” \textit{St. Louis Post-Dispatch} 9 May 1976, 1.
Historian Adam Rome set forth several reasons why women became increasingly active in grassroots environmental efforts in the 1960s. For many, he said, it was an opportunity to use their talents and to do something that “seemed to some more challenging and important than traditional volunteer work.” Beyond the chance to be useful, however, the environment seemed a natural extension of the home, as a place within women’s sphere of responsibility. Just as with the St. Louis Baby Teeth Survey and the fight for the Nuclear Test Ban Treaty, women responded to environmental threats as threats against their families. “Even in 1970,” Rome wrote, “after the publication of Betty Friedan’s *The Feminine Mystique*, after the formation for the National Organization for Women, after the first women’s liberation protests—women in environmental groups often appealed directly to housewives and mothers.”

One of the best examples of this was “The Solid Waist Manual,” written by the Savannah-Chatham County, Georgia League of Women Voters (LWV). It was a collection of “recipes devoted to avoiding waste.” The introduction stated that “This cookbook reflects our continuing concern with the problems of waste—in the kitchen or elsewhere. Our contributions are dedicated to eliminating waste and can either be kept or eaten … If all else fails, please see the last recipe.” The booklet included a wide array of dishes that could utilize ingredients on-hand, including, “Evelyn Mark’s Chicken Supreme,” (chicken, grapefruit, oranges, onions and orange juice), “Humdinger Cookies” (with Rice Krispies, dates and pecans), “Peanut Butter Soup” (V-8, milk and home-ground peanut butter), “Ozark Pudding or Huguenot Torte” (apple cake with nuts).

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106 Ibid. 539.
“Glurp!! Energy Pick-Up” (trail mix), and “Left-Overs for Company” (leftover meat in pastry puffs).  

Sprinkled amongst the recipes were politically philosophical quotations like, Henry Clay’s “Government is a trust…..” And Plato’s thought that, “The penalty that good men pay for not being interested in politics is to be governed by men worse than themselves.” The final recipe, sitting above Tom Paine’s maxim, “Those who expect to reap the blessing of freedom must undergo the fatigue of supporting it,” was the recipe for the “Last Resort Compost Heap,” which instructed readers what could be composted and how to manage their pile.  

Interestingly, the St. Louis Health Department had made Mrs. Henry Klouse, “to get rid of her backyard compost pile,” before wanting to put the Union Electric transfer station across the street from her front yard. Echoing the NIMBY attitude of other Carondelet residents, she argued that, “There’s too many run-down neighborhoods where they could put something like this.”

The thinking of LWV associations across the country reflected both the notion of personal responsibility and support for technological solutions. The Dane County, Wisconsin, League issued a study in the early 1970s and concluded that,

While waste material will always be a by-product [of] man’s activity, reasons for the rapidly increasing amounts per person should be questioned. Population pressure is taxing our ability to dispose of waste. Our proliferating technological society and the affluence it has produced has multiplied the problems, not only of the disposal of waste products, but of the depletion of the earth’s reserve of natural resources.

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108 Ibid.  
109 Ibid.  
110 Jerri Stroud, “Residents Skeptical Over Trash Terminal Plan,” St. Louis Post-Dispatch, 25 August 1975, 1S.  
But solid waste persisted even in places with comparatively low levels of technology. A video from the League of Women Voters of Alaska showcased burning garbage in barrels as an improvement to leaving it lying around the village. The most technological disposal method was often portrayed as the best option. A town in western Alaska burned area garbage in its incinerator. “They also have a water treatment plant to purify water from the Yukon,” the narrator stated, “and a laundry, all in the same building as the incinerator.”  

The ambivalence among the various chapters of the LWV about technology and solid waste disposal is understandable considering the vast network that existed under the national umbrella. In 1971, the year the league started dealing with trash, there were over 1,300 chapters in all 50 states, as well as D.C., the Virgin Islands and Puerto Rico. Within a couple of years the league would support resource recovery as part of an integrated waste management strategy but only after efforts were first made to cut waste. The industry practice of planned obsolescence should end and that which could be recycled, should be. But as League member Lois Sharpe wrote in a national study, “The OPEC embargo brought home clearly the value of the nondurables and the organic components of solid wastes as an additional energy source.”  

The League was aware of the possible conflict of interest between a mother protecting her family and the promotion of community-wide solid waste disposal facilities. By not pursuing zoned industrial sites, a city opened itself up to “garbage

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dump paranoia” in the area where the facility was sited.\textsuperscript{114} This is what happened in St. Louis. The Missouri LWV supported “any acceptable method which will bring the ‘trash to kilowatts’ program to fruition.”\textsuperscript{115} Although the local League supported the Union Electric facility, its first choice of transfer station in the Carondelet neighborhood’s sports field would obviously be a problem for any woman who looked at the environmental movement as a way to help her family. Mrs. A. Pourcillie wrote into the \textit{Post-Dispatch} that

\begin{quote}
I, too, agree, that this method would be of much improvement over the incineration of garbage, but I am thoroughly against having one of these transfer terminals in our back yard! Perhaps the League of Women Voters is unaware there is a proposed site by Union Electric in a residential area in South Side. This type of plant should be built somewhere, where citizens would be free of its noise, traffic, foul smell and rodents!”\textsuperscript{116}
\end{quote}

A trio of women who would go on to have significant roles in local and national environmental and energy issues wrote in to support the plant: Janet Becker, who worked with the St. Louis Committee for a Nuclear Weapons Freeze in the 1980s; Lenore Loeb, who would become head of the Missouri League of Women Voters Energy Task Force; and Suzanne Pogell, who became director of the League’s United States’ Environmental Project Section.\textsuperscript{117} Their qualifications did not impress Don Fanetti who wrote and asked “how they would feel if the installation was earmarked for their neighborhood.”\textsuperscript{118}

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\textsuperscript{114} Ibid. 345. \\
\textsuperscript{115} Mickey Hall (State President) “One Answer,” (Letter to the Editor) \textit{St. Louis Globe-Democrat} 4 March 1977. \\
\textsuperscript{116} Mrs. A Pourcillie, Letter to the Editor, \textit{St. Louis Post-Dispatch}, 14 October 1975. \\
\textsuperscript{118} Don Fanetti, Letter to the Editor, \textit{St. Louis Post-Dispatch}, 10 October 1975
\end{flushright}
Feminist scholar and economist Eiman Zein-Elabdin wrote that the convergence of women and the environment has typically been analyzed under two paradigms: eco-feminism and Women in Development (WID). She writes that, “In WID, women are treated as rational beings who readily respond to economic incentives within any cultural setting; in ecofeminism, women possess a supramaterial bond with nature that endows them with a privileged understanding of the environment and an innate ability to care for it regardless of the specific institutions at work.”\(^{119}\) The League of Women Voters would most closely fall under the WID paradigm, as they worked in their rational best interest to improve the quality of life for themselves and their families. One major promise of resource recovery was that it would allow unabated consumption, but in their rhetoric and their cookbooks, the women urged reduced consumerism. This could also put them in the anti-development camp and align them with ecofeminism. In the 1960s and 1970s many groups shared the ecofeminist view that “development has resulted in environmental destruction.”\(^{120}\) As George R. Stewart wrote in his classic work, Not So Rich as You Think:

> But now some technologists produce a detergent or a plastic having a composition not known to nature. Unless we assume a conscious planning of the universe, we can hardly expect that through the ages some organism has been evolving with a digestive system adapted to the highly specialized new product—some organism, so to speak, that says, “Ha! This is just the food that I have been waiting for.”\(^{121}\)

Barry Commoner, of course, began his public environmental career to counter pro-atomic science sponsored by the government. He would carry that technological

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\(^{120}\) Ibid., 932

skepticism into the realm of solid waste disposal technology years later. The League of Women Voters, on the other hand, was strongly anti-nuclear but pro-resource recovery. In the 1980s its nuclear position softened, and its resource recovery support weakened in favor of recycling. Sociologist Lin Nelson wrote about the U.S. Council for Energy Awareness’s pro-nuclear advertisements in Ms. Magazine in 1983; although she was not certain what it meant as far as women and nuclear weapons, it was at least a sharp departure from older, patronizing promotional materials that treated women as mindless consumers. She argued that

The feminist critique of sex roles and sexism calls upon the industry to rethink policy and propaganda. Women's increasing presence, occasional power, and persistent pressure on liberal capitalist institutions have forced the energy establishment to see women not only as consumers, but also as managers, scientists, financiers, technicians, politicians, and political activists.122

Women had moved from being primarily consumers to producer-consumers throughout the 1970s, and the nuclear promoters were catching up with this notion in the 1980s. While nuclear advocates finally decided to share technical aspects with women, resource recovery was not really ever portrayed in the strictly scientific way that nuclear power was. It was an engineering feat more often considered magical or miraculous, as Mayor Cervantes said, “a godsend.” The various processes and their by-products were alternatively referred to as “the Cinderella fuel,” “urban ore,” “gold,” and “alchemy.” The LWV discussed the subject in more professional terms, and perhaps more rationally, than many media reports, which were often filled with “puff” about the economic possibilities of resource recovery.123 And the national advertisements distributed by

122 Ibid. 299;
Union Electric were not condescending like the early nuclear ads for women, but easily accessible to the layperson: “For over two years, the company has been proving that it can burn ordinary trash and garbage to help produce electric power. By 1977, when this system is fully extended, it will process all the metropolitan area’s refuse, recover the steel and other recyclables, and provide fuel to generate over five percent of its power needs.”

Resource recovery was less authoritarian than nuclear power. In the early years everyone from backyard tinkerers to major local corporations were building resource recovery plants. Until the mid-1980s many Americans saw resource recovery as “a motherhood and apple pie issue,” that is unless it was too close to their neighborhood. No one thought of nuclear energy as “motherhood and apple pie.” Once resource recovery became the domain of outside, specialists companies, however, and conflicting scientific reports warned of pollution dangers, all strains of environmentalists began to perceive these new plants as “too costly, too centralized and of a scale incompatible with democratic control,” accusations not very different than those that faced the nuclear industry. While St. Louis would get a nuclear power plant, the city was not beyond local democratic control. Operating within their local institutions, St. Louis citizens

124 St. Louis Radio WRTH Editorial #2-7, 19 February 1975, Poelker S1B47, Streets, Garbage and Rubbish Collection April 1973, University Archives, Department of Special Collections, Washington University Libraries.
regulated the finances of the behemoth utility, which responded by taking away their “godsend” of a solid waste disposal solution.

Proposition 1 and Pastrami

Union Electric had threatened to call off the project after the Carondelet and Brentwood siting attempts. The city and neighborhoods provided other options, but their proposed sites put “us in a less competitive position,” the company argued. As Union Electric was not going into the trash hauling business, the company had to make sure that local haulers would choose to dump waste with them, thus ensuring the plant’s waste stream. By the 1980s, this was a common argument against resource recovery by environmentalists, who had shifted their support to recycling: resource recovery facilities had to have a minimum amount of waste in order to operate. Being an electric company, Union Electric had little incentive to encourage conservation and waste minimization. Consequently, some argued the plant had a vested interest in promoting waste and consumption. Transfer station opponents were not surprised by the company’s threats. The South Side Journal published an editorial that stated, “U.E.’s chant [about scratching the plant] is not totally out of character. Seems we hear it every year at this time as that bunch goes before the state’s Public Service Commission in hopes of jacking up electric rates. Right now they’re asking for a 22 per cent rate hike.” As a privately owned public utility, Union Electric had to get permission from the state to raise its rates, but the company also had stockholders who profited when the company made money.

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In March 1976, just a day after the Post-Dispatch ran a story saying that the plant was “not assured” anymore, for the first time an organization with authority put forth a serious concern about the possibility of air pollution at the resource recovery plant.\(^\text{131}\)

While Union Electric had thought of the process as a way to reduce sulfur dioxide emissions from coal, the EPA, which began researching the plant with the company the previous June, said they found that burning trash in the process might cause “unacceptable levels of pollution,” which it predicted could be ameliorated with, possibly expensive, pollution control devices.\(^\text{132}\) Although the federal government had issued New Source Performance Standards for utility boilers, the standards were not meant to apply to “retrofitting a utility boiler to burn solid waste as a supplemental fuel,” so any pollution regulation would happen only on the local and state levels. It would be fourteen years before federal standards were set in the 1990 Clean Air Act. “High levels of bacteria and viruses” had also been found inside the pilot plant, so the agency was planning to study those to see if they were escaping the building.\(^\text{133}\)

In May 1976, Union Electric was having a familiar debate with Fenton, which was further south than Carondelet and further west than Brentwood. Just like Carondelet, Fenton did not want a transfer station. Residents said, “Yes, it’s a good thing, but we don’t want it in Fenton” and voted to reject the project in May.\(^\text{134}\) Fenton’s aldermen

\(^{131}\) “UE Waste Plant ‘Not Assured,’” St. Louis Post-Dispatch 3 March 1976.


\(^{134}\) Jerri Stroud, “UE Trash Plant Site is Rejected in Fenton,” St. Louis Post-Dispatch, 18 May 1976.
voted against the plant, leaving its future in a precarious position. After its third rejection, Union Electric put the resource recovery project on hold, giving “no assurance that this problem will be resolved and that construction of the system will be resumed.” The company did not cancel the project, though, as it had already invested $12 million, $3 million of which could not be recovered.\textsuperscript{135} The \textit{Post-Dispatch} noted the waning of political support in the face of mounting opposition, quoting an insider who stated that, “It’s a no-win situation from the politicians’ viewpoint. … If a politician takes a stand now he’s in trouble. If he just waits until a crisis develops, then he can propose anything and be a hero.”\textsuperscript{136}

While the resource recovery plan waited in limbo, grumblings began to mount against Union Electric and its continuous rate hikes. Earlier in the decade, the federal government had worried about utilities investing in research and development projects, but Union Electric had two major new facilities in the works, the now $80 million RDF resource recovery plant and a nuclear generator in Fulton, Missouri, about 100 miles west of St. Louis. The 1973 Energy Crisis had caused many utilities across the country to switch from oil to coal, putting a premium on the latter, especially low-sulfur varieties, which were needed to meet air pollution standards. In 1973, the federal standards had been relaxed in light of the energy crisis, but everyone was supposed to be meeting them by 1975. The competition for coal then caused prices to rise, and Union Electric’s fuel bill rose 42% from 1974 to 1975.\textsuperscript{137} To lessen its dependence on the market-vulnerable coal, the company planned to build a nuclear generator in Fulton. The company

\textsuperscript{135} Margaret W. Feivogel, “Situation Wanted,” 1.
\textsuperscript{136} Ibid.
projected that work on these two major projects, along with other development plans, would cost almost $240 million in 1976, and $2.2 billion through 1980, with the bulk of the money going towards the nuclear project.\textsuperscript{138}

Many St. Louis residents wondered why Union Electric shareholders were making profits and the company continued to push forward with new projects while they were experiencing such high rate hikes. A normal business would need to have profits before investing in future projects. In a free market this caused businesses to be leaner and to exercise a certain amount of caution. But critics said that Union Electric was taking any profits, giving them to its investors instead of reinvesting them in the company, and then asking the citizens of St. Louis to pay for new investment projects. Three professors from St. Louis University said that the company’s strategy was “a maneuver which permits the utility to avoid the discipline of the free market system.”\textsuperscript{139} Union Electric argued that the company’s investors were saving taxpayers huge amounts of money and that, without profits, there would be no investors. Additionally, because of the company’s profits, it had paid nearly $100 million in taxes in 1974.\textsuperscript{140}

The grumblings turned into a fully organized protest when company president Charles Dougherty gave a speech, saying that “our greatest current infirmity is the demise of the Puritan ethic of self-responsibility.”\textsuperscript{141} This admonishment in light of the persistent threats of Union Electric to back away from projects if it were required to meet state environmental regulations or did not receive public support, along with its financing

\begin{footnotes}
\footnotetext{138}{"UE Waste Plant ‘Not Assured.”}
\footnotetext{139}{“3 Professors Criticize Backing for UE Plan,” \textit{St. Louis Post-Dispatch}, 3 October 1976, 22A.}
\footnotetext{140}{Bill Kester, (Economic Common Column) “Public Ownership of UE?” \textit{St. Louis Post-Dispatch} 1 December 1975.}
\footnotetext{141}{Jake McCarthy, “UE’s Self-Responsibility” in his “A Personal Opinion” column, \textit{St. Louis Post-Dispatch} 25 May, 1976.}
\end{footnotes}
methods which appeared to profit shareholders at the expense of the citizen, proved to be too much for some in St. Louis. In his “A Personal Opinion” column Jake McCarthy of the *St. Louis Post-Dispatch* responded by asking,

> So why is he asking his customers to build his new plant for him? Our sense of self-responsibility, it seems to me, has been subverted in part by the advertising campaigns to encourage electric hoes, air conditioners, handy electric appliances and what not. And then, when we have become suitably reliant upon the soft life, we find our resilience missing when our residential electric rates are upped some 14 percent, as they were a few months ago.\(^\text{142}\)

Earlier in the decade, Senator Muskie had complained about this power the utilities had to threaten citizens over policies that went counter to the wishes of the companies. He said the threats were “an old bugaboo and we have to be able to identify the real from the fictitious.”\(^\text{143}\)

In the case of Union Electric’s resource recovery plant, the threats were real. In November of 1976, Missouri residents voted over one million to roughly 700,000 to pass Proposition 1, which prohibited “the utility from charging the customers for the construction of power plants before they start producing power.”\(^\text{144}\) The company said the law would slow the construction of the Fulton nuclear plant by one year and would postpone a second nuclear plant at the same location by four years, driving up the costs by $800 million.\(^\text{145}\) To make up for the higher prices, the company asked for another 14% rate increase, the fifth increase in seven years. Business, for the most part, seemed to run as usual despite Union Electric’s legal counsel and vice president Stewart Smith

\(^{142}\) Ibid.
\(^{143}\) *Industry Week*, 24 May 1971, 50.
\(^{145}\) Ibid. The first plant was delayed by a total of three years, and the second plant was never built.
Jr.’s fears. “I have six Budweisers and a hot pastrami every night and have nightmares about what interpretations (of Proposition 1) might be brought up,” he said. Diet rather than business realities was probably responsible for his nightmares. Stockholder returns would be reduced from 14 to 12.9%, and for the consumer, after the initial hike, rates were supposed to remain fairly steady until the Fulton project was complete, at which point they would be faced with another large hike.

The major result of Proposition 1 was the abandonment of the resource recovery plant, which the company said it could no longer afford. Dougherty characterized the area response as “a lot of weeping and wailing and gnashing of teeth.” If the city was surprised by the pullout, it should not have been, he said: “We talked until we were blue about its delaying construction and other results. The proponents (of Proposition 1) said we were crying wolf, but we warned of the important effects. Whether we did about these details [the future of the resource recovery project], I don’t recall.” Many in the city thought the company was acting in revenge. Although local environmental groups had some questions about the RDF process, to abandon the city to the worse methods of incineration and landfilling was “spiteful.” Dougherty responded that the company had real “enthusiasm” for the project and would not abandon it if they did not have to, saying, “I don’t know when I was ever as excited about anything as I was about this. We really regret having to abandon it.” Ultimately, though, the responsibility lay with the

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146 Ed Wilks, “Union Electric Loses Battle, But the War is Not Over,” St. Louis Post-Dispatch, 12 December 1976.
147 Ibid.
148 E.S. Evans, “UE Cancellation of Trash Plan is Called Final,” St. Louis Post-Dispatch, 15 February 1977.
public’s regulations, not with the company, he stated, noting that, “If you hit a man over the head and he bleeds, it’s not right to call the bleeding revenge.”

The desertion of the plan left the city to turn to its two 1950s incinerators and handful of landfills for its solid waste needs. Other towns in the region were left to their own devices. The city still had $800,000 from a bond issue held in the late 1960s, right before Union Electric became the center of their solid waste plans. That amount was a pittance, however, compared to the $20,000,000 officials estimated it would cost to replace the incinerators. The Union Electric plan had been expected to save St. Louis $1.5 million a year, a cost that would now be transferred to taxpayers.

While St. Louis had been busy making plans with Union Electric, resource recovery became an important interest of other cities across the country and world, as well as for their citizens. Many had been watching St. Louis to see what would happen. From 1970 to 1976, letters came into the Mayor’s Office from places like Los Angeles, California; Florence, Italy; Greeley, Colorado; California Polytechnic University; and Sault St. Marie, Canada. People, like Ernest Greer, of Monterrey, California, admired the city’s conservation efforts, writing, “Just a short note to let you know how nice it is to make the discovery that a major city in the United States is taking steps forward in the combating of waste … My concerned approval is yours and may others heed your example.” Others, to the chagrin of environmentalists, who were interested in the process but wanted to make sure its consequences were better understood, wanted to emulate the process. “People are calling from places like New York or Tennessee and

152 “Board Cancels Hearing on UE Trash Site,” St. Louis Post-Dispatch 2 September 1975.
153 Letter from Ernest Greer (Monterrey California) to the Mayor (Cervantes) received 22 March, 1973, Cervantes S2 B78 Streets-Garbage and Rubbish Collection, April 1 1969; University Archives, Department of Special Collections, Washington University Libraries.
running around the country copying the system when no one even knows if burning is the best way,” Ben Senturia Jr. said. “It’s putting the cart before the horse.”  

While many areas were interested, not many could afford to pursue their own resource recovery efforts until they were certain of success. Cities that had felt abandoned by Nixon’s solid waste cuts pushed for more intervention, especially in the area of markets, which were crucial to the success of resource recovery projects. At the time Union Electric first began having siting problems, experts projected a resource recovery “slow-down.” As Dr. James Abert of the National Center for Resource Recovery stated, “There is also a shortage of risk-taking mechanisms. Money from the Federal government is all but gone. Most states, on the other hand, have not developed the institutions, approaches or the perspective to become risk-takers for prototype facilities.” In 1976, however, a new law, the Resource Conservation and Recovery Act (RCRA, pronounced Rick-Rah) would offer new funding and new hope to the country’s resource recovery endeavors.

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Chapter 2: Baltimore, the Bastards and the Most Famous Pyrolysis Plant

On June 1, 1975, the Extra supplement in the Baltimore Sun, reported that,

Baltimore’s one-of-a-kind garbage-baking plant is nearly ready. Four and a half years after the decision was made to build it, and months after it was scheduled to be finished, the sprawling contraption of conveyors, collectors, crushers, pipes, cookers and boilers is complete and being tested on its 16-acre site along the eastern edge of Russell Street. Contrary to first impressions, this is not a Rube Goldberg post-pizza nightmare. It is a highly automated pyrolysis plant, a system designed to reduce 1,000 tons of trash and garbage each day to useful steam, recyclable glass and metal, a small amount of clean, non-smelly landfill residue, and scrubbed breathable smokestack emissions.¹

The garbage-baking plant was Monsanto’s Langard Pyrolysis system. If Union Electric’s refuse-derived-fuel plant had one of the most technologically simple resource recovery processes, Monsanto had one of the most technologically exotic. Pyrolysis, also called destructive distillation, was one of the most promising types of resource recovery. Instead of burning waste, pyrolysis plants heated it in an oxygen-deprived atmosphere until it changed form, similar to the way substances change form during cooking. The resulting liquid, solid and gas were each captured by different methods. The usual byproducts of pyrolysis, then, were oil, carbon or char, and gas. If pollution meant waste in a particular industry’s system, the same was true in pyrolysis, which ideally operated on its own waste, greatly minimizing emissions from the plant.

Like St. Louis, in the early 1970s Baltimore was looking for a place to host a new landfill. The city also had two incinerators which were not up to pollution standards and seemed too expensive to fix. Baltimore’s mayor, William Donald Schaefer, paid a construction company owner $16,000 an acre for a quarry just outside the city he hoped

¹ Peggy Cunningham, “Garbage Power for Baltimore,” Baltimore Sun Extra, 1 June 1975, 8.
could be the new waste disposal site. After the $2.2 million purchase, however, the
neighboring county refused to rezone the land, and the city still needed a solution. In his
political biography of Schaefer, C. Fraser Smith stated that, “entrepreneurs, con men, and
necromancers appeared at Board of Estimates meetings for the purpose of showing city
officials how to deal with trash, suggesting that they could make it vanish.” The state
legislature had recently formed its Maryland Environmental Services department and
charged it with the task of “being as creative as possible” in dealing with the country’s
“shortage of energy and the surplus of junk.” Baltimore’s need, combined with a mayor
who desperately wanted to improve his city’s image and a state funding agency willing to
experiment created a kind of perfect storm for the country’s largest resource recovery
failure.

In October 1972, Baltimore signed a contract with Monsanto for its Langard
system, even though, as one local businessman recalled, the company only had “a model
as big as a coffee table.” The next month voters approved $4.2 million in additional
funding, making a total contribution of $6 million from the city. The EPA also provided
$6 million, and Maryland Environmental Services provided the remaining $4 million for
the $16 million project. Monsanto agreed to pay $4 million in performance penalties if
the plant was not up to par.

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2 F. Pierce Linaweaver, “Baltimore Tries Pyrolysis,” American City 89, no. 5 (May 1974), 50
3 C. Fraser Smith, William Donald Schaefer: A Political Biography (Baltimore: John Hopkins
University Press, 1999), 184.
4 Joanne Omang, “Maryland Trying to Squeeze out Energy from Waste,” Washington Post,
November 25, 1977, Metro C1.
5 C. Fraser Smith, William Donald Schaefer, 185.
6 Ibid. 186.
7 F. Pierce Linaweaver Testimony, “The Environmental Protection Agency’s Responsibilities in
Relation to Its Budget Request,” Hearings Before the Subcommittee on Air and Water Pollution on the
Committee on Public Works United States Senate, 93rd Congress, First Session, March 28-30, 1973, 260;
Despite its name, the Langard pyrolysis system had a very unpyrolitic ingredient: air. Shredded waste entered the plant’s kiln at the top, where it was heated, while hot air and oil were pushed in through the bottom. The only elemental change in the process was from solid to gas, and the rest of the material was separated after the process. The EPA believed this mixed technique made it the “simplest of systems.” Whether or not the process was simple in theory, it did not prove to be simple to run. Monsanto’s plant experienced something that Union Electric’s never did, a scale-up in size. The plant’s failure would cause the EPA’s environmental engineers to rethink the promise of pyrolysis and resource recovery. If a process cost millions of dollars and might not even work, it would not do much to alleviate cities’ solid waste headaches. Cities and Congress had been pushing for these solutions even if the president and EPA had not. In the mid-1970s, however, resource recovery proponents were starting to align themselves with particular reasons for supporting resource recovery: either saving materials, saving energy, creating energy, or solving the environmental hazard and hassle of solid waste.

After the failure of Baltimore, however, cities would no longer feel they had the resources to experiment for the sake of attaining any of the loftier environmental goals. By the time Monsanto quit the project, the federal funding apparatus, Section 208 of the Resource Recovery Act, that had helped finance Baltimore would be abandoned. As the plant failed the U.S. government would switch its high-tech waste management focus from new American innovations to already-tested European solutions.


Before RCRA

Energy worries had been mounting since the beginning of the decade. The United States had had oil import quotas, limiting the amount of oil the country could bring in, since Dwight Eisenhower instituted the Mandatory Oil Import Program in 1959. In 1970, U.S. oil consumption increased by about 2.5 million barrels a day, 22 percent of which was imported. As cities across the country experienced brownouts that winter and domestic production began to decrease within the next couple of years, energy became a central concern of the Nixon administration. The president presented his first energy message to Congress in the summer of 1971, which Martin Melosi has described as “probably the most comprehensive message of its type ever sent to Congress.” By 1973, Nixon had abolished the import quotas and in November announced his Project Independence plan to eliminate all oil imports by 1980. This plan led to the national 55-mile-per-hour speed limit and to cars with better gas mileage. About a month before the seriousness of Watergate became evident he gave his second energy message to Congress, asking for the deregulation of natural gas production, the go-ahead for the Alaskan oil pipeline, opening up the outer continental shelf, and the relaxation of environmental standards that prohibited energy production.

Despite its lack of popularity with Nixon or the EPA, Congress still saw resource recovery as a decent source of energy and a way to conserve materials. EPA’s Report to Congress in 1973 stated that, “Preliminary research and analysis indicates that, when compared with virgin materials extraction and processing, resource recovery results in

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lower quantities of atmospheric emissions, waterborne wastes, mining and solid wastes, and energy consumption.” It went on to say, however, that, “There is substantial disagreement among experts about the extent of such differential effects over time, particularly as strengthened environmental constraints on use of both virgin and secondary materials begin to narrow the differentials that now exist.”

Reflecting the EPA’s tepid feelings towards its involvement in such processes, the report argued that resource recovery was “an important part—but only a part of the larger picture” of a solution for American consumption. All of the “key findings” of the report pointed to problems with the economy and markets but just like others who were interested in environmental legislation, many resource recovery proponents did not place economics as their highest priority. People following this line of thinking believed that resource recovery could be valuable in terms of energy and material savings even if it was not financially successful. One could argue that even if a resource recovery plant did not itself make money, it was an appendage of a consumer society. Even if it were such an appendage, however, that does not automatically diminish its environmental contribution. The historically assumed opposition of environmental motives and economic interests has recently been re-examined in historian Andrew Kirk’s *Counter Culture Green: American Environmentalism and the Whole Earth Catalog*. In his work, Kirk shows how environmentally-minded members of the counterculture like Stewart Brand, creator of the *Whole Earth Catalog*, and Yvon Choinard, founder of Patagonia, knew and did not object to the power of money and its ability to accomplish

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12 Ibid., vi, vi.
environmental goals. While the outlaws may have believed in appropriate technology and soft energy, they relied on capitalism to spread their brand of environmentalism.  

Certainly there were many environmentalists, however, who did believe environmental problems could not be solved without changes to the economic system. One of the arguments against resource recovery sounded very much like environmentalist critiques of capitalism. Donald Whisenhunt wrote in his 1974 work *The Environment and the American Experience: A Historian Looks at the Ecological Crisis* that, “American capitalism … exploits for its own benefit the natural and human resources of the nation. Increasing production becomes an end in itself, because the system is based on the concept of ever-increasing production and consumption which use up the available resources.” Opponents and skeptics often felt resource recovery could lead to the same danger, arguing that consumption and disposal would have to be encouraged for the plants to survive. As Ben Senturia had said about the Union Electric plant, “it could develop a built-in need for quantities [of] waste. The public then would have to generate waste to make the system work, instead of trying to reduce unnecessary waste in the environment.”

Barry Commoner was in the camp of environmentalists who believed capitalism and environmental health were irreconcilable. Michael Egan explained

As Commoner saw it, the dependencies … followed a directional logic: the economic system depended upon the production system and the production system depended upon the sustainable resource capacity of the ecosystem.

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But free market capitalism had tried to reverse this logic. Because capitalism thrived on perpetual growth, the economic system imposed continual and increasing demands upon the production system, which in turn stressed the ecosystem. Such inefficient consumption of nonrenewable resources broke with the kind of economic sustainability and security that Commoner advocated, but it was suggestive of the economic confidence—or arrogance—that had propelled the American economy during the postwar years. By the 1970s, however, that confidence was on the wane.16

Besides more widespread knowledge of the dangers of fallout, which Commoner’s work had helped to proliferate, part of the reason for the loss of confidence was a book that had reached enormous heights of popularity after it was published in 1962, Rachel Carson’s *Silent Spring*, which was, in scholar Robert Gottlieb’s words, “an epochal event in the history of environmentalism.”17

_Silent Spring_

Just like Commoner, Carson was angered by activities humans were pursuing without full or adequate knowledge of the consequences. Unlike Commoner, Carson did not question the economic system, instead asking industry and government to reevaluate the costs of their environmental goals, such as the plan to totally eradicate the fire ant.

Numerous scholars have written about Carson and the treatment she received from

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16 Michael Egan, *Barry Commoner and the Science of Survival: The Remaking of American Environmentalism* (Cambridge: M.I.T. Press, 2007), 149-150; In an article entitled “The Energy Crisis—All of a Piece,” that appeared in The Center Magazine March/April 1975 (26-31), Commoner also criticized Communism and Socialism, saying “After all, when Fiat automobiles are produced in Moscow they can be expected to use as much gasoline and emit as much pollution as they do in Rome. And when the petrochemical complexes that are so largely responsible for the wasteful, environmentally destructive use of energy in the United Staets are imported by Russia, Poland, and even China, they will certainly impose these same pernicious hazards in their new locations.” (29)

industry, scientists and the press before and after the publication of *Silent Spring*.\(^{18}\) While Commoner and Carson drew similar conclusions about the unwise pace of technological progress and the importance of public knowledge of risks, they reached their views differently. In her article “The Nature of Knowing: Rachel Carson and the American Environment,” Vera Norwood repeatedly pointed out that Carson did not believe that the environment could truly be understood. She argued that, for Carson, “Lack of adequate symbolism, not lack of knowledge, is the issue; we continue to look for simplicity and regularity instead of recognizing that nature cannot be conceptually tamed through metaphor.”\(^{19}\)

Carson thought that “seeing and feeling” the ambient environmental situation rather than looking for patterns and categories would best help humans evaluate their relationship to the environment.\(^{20}\) This philosophical approach was the opposite of the emphasis Commoner and others placed on cybernetics and systems theory. Yet, both scientists were holists and both agreed that large-scale, high-tech solutions were very often more detrimental to the environment than small-scale answers. Both opposed the belief that new science would always be able to get humans out of messes that old science had gotten them into. Historian Michael B. Smith argued that Carson’s critics were “were trying to preserve the public’s credulity in the ability of science and technology to solve problems both presented by nature and those that developed as

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\(^{19}\) Norwood, “The Nature of Knowing,” 757

\(^{20}\) Ibid. 757
unforeseen consequences of applied science.”  

While other environmentalists, like Commoner’s rival biologist Paul Erlich, held the Neo-Malthusian belief that exponential population growth was the largest looming threat to the environment, Carson, writing before *The Population Bomb* scare, and Commoner both believed that unrestrained technological growth was the most significant problem facing humans.  

**Monsanto’s Response**

It was a pro-technology response to Carson’s work that led to the development of Baltimore’s pyrolysis plant. Before *Silent Spring*, Monsanto had not been “among the most vocal companies in American industry,” according to company biographer Dan Forrestal. “Taking a safe and cautious course, Monsanto was often inclined to avoid controversy, or at least to avoid provoking controversy.”  

After the serialized run of *Silent Spring* in the *New Yorker*, however, the once unprovocative company hit back with “a rebuttal which burst upon the scene like a skyful of rockets.”  

One could draw parallels between the description of cautious, non-controversial Monsanto and the shy and reserved Carson, both of whom released works that belied their descriptions. The Monsanto article published in *Monsanto Magazine* was entitled “The Desolate Year.” The article considered what would happen if humans left nature “to seek her own balance” and “the United States were to go through a single year completely without pesticides.”  

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21 Smith, “Silence Miss Carson!” 740  
22 *The Population Bomb* was Paul Erlich’s 1968 book on the pending population crisis. For a detailed analysis of Commoner’s beliefs about population see Michael Egan’s *Barry Commoner and the Science of Survival*, 118-131  
24 Ibid., 194  
crop failure, painting a grim picture of the ability of nature to meet human needs in the face of insect invasions no longer restrained by human intervention:

So went the fresh, clean vegetables. So went sweet corn, for that year hardly an ear from corner to corner of the nation brimmed with just its own sweet juice. If its stalk and ear escaped the harsh attack of the borers, along came the earworm, hatching from eggs that a brown-gray moth slipped into the receptive silks alongside the life-giving pollen. Her worm-children ate and defecated and ate more, working from the tender small kernels down into the large firm ones. So the farmers planted and cultivated, and too often the harvest was garbage.²⁶

Monsanto’s article, “The Desolate Year,” had drawings of bugs crawling all over it to remind readers what pesticides protected them from. (“The Desolate Year,” Monsanto Magazine October 1962)

²⁶ Ibid., 5.
Instead of protecting products from human adulteration, in Monsanto’s story the Food and Drug Administration was faced with products that had been laid waste by insects. Crops were not the only matter to suffer in the story. Hundreds of thousands of Americans died from malaria and tick fever, while cows, hogs and sheep all suffered from grubs, ticks, and flies that lived under their skin and in their hair or fleece. Grasshoppers united “in churning, boiling clouds that blotted the sun.” And termites “felled innumerable buildings, destroyed a state’s valuable papers, wiped out a library, (and) brought a service station tumbling down.” At the end of the story the author revealed that all of those events had actually happened at various times in the United States and that, “They could repeat themselves next year in greatly magnified form simply by removing the country’s chemical weapons against pests.”

Despite the tone of “The Desolate Year” and the legacy of *Silent Spring*, the actions of Monsanto and Rachel Carson were not completely at odds. Carson did not necessarily seek an end to the use of all pesticides, rather she argued that humans should stop trying to control nature and that everyone should know and consider the risks of chemical solutions before releasing them into the environment. Monsanto, by turn, was not without environmental sensitivity and had already discontinued production of DDT by 1962, which was the most dangerous pollutant discussed in Carson’s book. In the mid-1960s, Edward Monsanto Queeny, son of the company’s founder and himself CEO of the business from 1928 to 1960, wrote that “Some of the criticism has been valid. Some is being voiced by sincere, well-meaning people striving for a better way of life.

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27 Ibid. 6, 7.
28 Ibid. 8.
But some seems to have been mounted for political purposes. Some seems founded on something less than facts. And some seems simply vicious.”

Although many scientists and much of the media attacked Carson vitriolically, it seems as though Monsanto might have put Carson in the first group of people Queeny mentioned. About fifteen years after *Silent Spring*, Charlie Sommer, who was president in the 1950s and 1960s, reflected that,

> I’ve been asked in recent years whether Monsanto didn’t overreact (to *Silent Spring*). At the time, it didn’t seem so. Actually, I’m glad we spoke out. Yet as I look back, perspective suggests Miss Carson’s work was surely a lot more enduring in its influence than our rebuttal. Many people today believe her warnings should have been sounded. And her cry for a better and safer world still reverberates. I realize a lot of people remember that Monsanto spoke out with force and conviction, dramatizing the importance of pesticides, but the major thing to remember is that the new era forced all companies to take a harder look at the way they and their products were impacting the quality of life.\(^{31}\)

There was a basic, probably irreconcilable divide between Carson’s notion that nature could not be controlled and Monsanto’s development of products designed to control the environment, but it was the “500 new chemicals to which the bodies of men and animals are required somehow to adapt each year, chemicals totally outside the limits of biological experience,” that caused Carson to write *Silent Spring*, not merely the idea of attempting to control the environment.\(^{32}\) For a true technological optimist, who believed human ingenuity would solve human problems, it was not automatically a given that new technology would lead to some kind of environmental damage. Many other people, like those in the growing field of environmental engineering, believed that every environmental decision would probably have some cost, but often technology provided a

\(^{30}\) Forestall, *Faith, Hope and $5,000*, 194.
\(^{31}\) Ibid., 196.
\(^{32}\) Carson, *Silent Spring*, 7.
better solution than the alternatives. The Monsanto executives would belong to one of those two categories, and, of course, as businessmen, they saw a market in meeting burgeoning environmental concerns. While, as Sommer pointed out, it was Carson’s message that lingered with Americans the longest, Americans in the “Me Decade” did little to curb the consumption that allowed companies like Monsanto to seek unfettered means of production. The chemical companies were not seeking to destroy the environment; they were trying to create and meet market demand, which is why Commoner, along with other political critics like Murray Bookchin, Paul Goodman and Herbert Marcuse, said the capitalist system needed to be reconsidered or abolished.\footnote{For more on Bookchin, Goodman and Marcuse and environmentalism, see Gottlieb, \textit{Forcing the Spring}, 127-134.}

While Americans devoured Carson’s book and demanded regulations for pesticides and nuclear testing, they still largely believed in consuming and kept a faith in technology. As Melosi has stated, “A society that grew powerful because of its mastery of machines, acquisition of vast resources, and massive production of goods was not likely to abandon a faith and a dependence on technology and scientific method to help curb the excesses of those activities.”\footnote{Melosi, \textit{Garbage in the Cities}, 234.}

This faith in technology as a response to cries of environmental foul led to the creation of the Baltimore pyrolysis plant. In 1969, Monsanto created a subsidiary called Enviro-Chem Systems, Inc. The new company was supposed to work on marketable, environmental solutions using Monsanto’s technology. It collaborated with a Japanese company on a waste disposal plant before delving into the resource recovery business in the U.S. The Monsanto pilot project was its Langard Pyrolysis Plant, developed in Dayton, Ohio, as a test model that could process less than one-third of waste per day. By
the end of the year, Monsanto had built a model that could handle 35-tons of waste a day. The full-scale plant was supposed to produce 200,000 tons of steam per hour from 1,000 tons of waste per day. The only way the company could profitably build the full-scale plant would be to find a city to work with and then secure an EPA resource recovery demonstration grant.  

**EPA Demonstration Grants and Resource Recovery Technology**

Starting in the mid-1960s, the growing environmental mentality, along with the possibility of funding for waste management and resource recovery under the Solid Waste Disposal and the Resource Recovery Acts, caused a surge of interest in solid waste innovations from scientists, schools, the military, as well as large and small businesses across the country, all of which reflected the country’s characteristic technological optimism. New solutions included edible food wrappers, bottles that dissolved upon contact with water, cans that could be converted into building material, and Glassphalt, an asphalt-type substance made of glass. Individuals could literally cut waste with Ephrem’s Olde Time Bottle Cutter Kit, a Junior Achievement project, which turned empty bottles into "glasses, lamps, vases, candles and various other useful products" by using a cutter and heat and ice to create "thermal shock" to smooth the glass edges, making useful products. And M.I.T. built its own model material separator with EPA funding. An infrared reflectance spectrometer would shoot waves at an item, and another “gadget” would listen to the noise the waves produced. That machine and a metal detector would both send signals to a computer, which determined to which of about fifty categories the material belonged. Then a small cart, running on a closed loop, would pick

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35 Forrestal, *The Story of Monsanto: Faith, Hope and $5,000*, 193, 199; David Sussman Interview with author, Annapolis, Maryland; Joanne B. Winslow, “Baltimore Optimistic Despite Pyrolysis Troubles,” *American City and County* 91 no. 4 (April 1976), 12.
up the item, and take it to the appropriate hopper, where the bottom of the cart would open up and dump the item in.\footnote{Ingenuity," \textit{Chemistry} (November 1971), 4-5; Statement of David Gordon Wilson, professor of Mechanical Engineering, MIT, 1 April 1976, Hearings Before the Subcommittee on the Environment and the Atmosphere of the Committee on Science and Technology U.S. House of Representatives 94\textsuperscript{th} Congress Second Session, April 7, 8, 12, 13 1976, no. 102) U.S. Government Printing Office Washington 1976, 110.}

B.F. Goodrich proposed sinking tires to the bottom of the ocean to create artificial reefs that would provide a home to barnacles, mussels, sponges, and algae. The prediction was that, "within a year, the new reef is completely covered and the fish accept it as part of the natural environment."\footnote{Tires-New and Old," \textit{Chemistry} 44, no. 7 (July-August 1971): 4. Dumping MSW into the ocean was outlawed by a Supreme Court decision in 1934. Industrial and commercial ocean dumping are still permitted in the United States today with an EPA permit; although past experience with garbage washing back to shore has caused ocean dumping to become much more regulated. Melosi, \textit{Sanitary City}, 349; Environmental Protection Agency, "Ocean Dumping" \url{http://www.epa.gov/owow/oceans/regulatory/dump dredged/oceandroiding.html} (accessed July 7, 2006).} Despite the concern over pollution that had been popularized by the environmental movement, the idea of dumping municipal trash into the ocean past the Continental Shelf was acceptable to many. Many scientists said trash could not harm the ocean, as even if "40 million gallons of waste per day were emptied into the ocean for 1,000 years, the waste would be diluted with five million times its volume of sea water."\footnote{Kenneth Kovaly, "What Can You Do? with an Avalanche of Garbage?" \textit{Science Digest} 66, no.1 (July 1969): 72-73. See above footnote for more on ocean-dumping.}

Two Atomic Energy Commission agents suggested that the government could use energy from a hydrogen bomb to “vaporize” what they predicted would be ten billion tons of garbage in the United States by the end of the millennium. The bomb would cause the garbage to break down so that its component minerals could be harvested and reused. They claimed that all of the natural resources, except the hours of human
manufacturing, could be recovered. In a similar vein, some people considered garbage to be gold, literally. The Bureau of Mines found that burning a ton of garbage would typically yield $14 worth of silver and gold, causing *Science Digest* to predict that, "with gold and silver in those mounds of trash, it seems to be just a matter of time before someone actually begins to make a profit from garbage." Even those who took the gold analogy figuratively saw the similarities. "One has to look at this type of analysis in the same fashion as the mining engineer analyzes an assay of a potential ore,” wrote energy and resource expert S.L. Blum in 1976. Blum went on to write that one should follow the “urban ore” and “its assay from location to location and also for a long time period during which its composition may change.” These changes could result from consumer preferences or disposal techniques.

The numerous efforts that received funding obtained it from a variety of agencies, including: EPA’s Office of Solid Waste; the U.S. Department of Commerce; the U.S. Department of Interior, Bureau of Mines; the U.S. Energy Research and Development Administration (ERDA) and the Federal Energy Administration (FEA). Many of the larger projects received money from multiple agencies. By the mid-1970s Congress would be frustrated by the lack of clarity regarding the different agencies’ responsibilities. At a 1976 Hearing Congressman Leo Ryan asked the EPA, ERDA and FEA to explain how they delegated their efforts:

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40 Kovaly, "What Can You Do?" 73.


Congressmen Leo Ryan (California): Do the three agencies (EPA, ERDA, and FEA) have any kind of common agreement as to what your area of responsibilities are? ... With the substantial disagreement I've heard this morning with who's doing what and where among the three agencies----

Roger Strelow, EPA: I wouldn't call that a disagreement but the only area of overlap which remains to be sorted out--and which is actively underway--is between ourselves and the ERDA. I don't think there is any issue with ourselves and the FEA and so far as I know between ERDA and FEA.

Ryan: That may be your perception but sitting here as a sort of customer and on the outside trying to figure out what you're doing, I'm confused.

John K. Freeman, FEA: Perhaps you could clarify so we understand your perceptions of what problems or specific areas of difficulty there are.

Ryan: We're trying to turn garbage into energy. If there is nothing else than a simple page or two that explains what the three of you are doing, I could use it. And perhaps every member of this Congress could use it. Nobody knows. You may know, but we don't know.43

By the time the agencies finally submitted a Memorandum of Understanding outlining their jurisdictions, three years later, the FEA and ERDA would be replaced by the Department of Energy, and Congressman Ryan would be dead, after being viciously murdered on an airplane in California by followers of Jim Jones on the same day as the Jonestown Massacre.44

The largest funding mechanism was Section 208 of the Resource Recovery Act, under the EPA’s Office of Solid Waste. Lanier Hickman, former director of the Solid Waste Management Association of North America wrote that these grants were “very popular and examined many new approaches in both resource recovery and solid waste...

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disposal." Chilton McLaughlin, who worked at the EPA during the 1970s, said that during its tenure the program, “had reach beyond the funding.” EPA agents collected data and evaluated programs so that other entities could consider them. “We participated in (many different projects) but at different levels,” he said. There was competition among the different methods to receive funding, and only a few were funded as demonstration projects. To qualify as demonstration plants, facilities had to process at least 200 tons of waste per day and demonstrate a new technology. Union Electric and Combustion Power Company of Menlo Park, California received Section 204 and 208 grants respectively to demonstrate different RDF processes. The Delaware Reclamation Project, which included ferrous recovery, nonferrous metal recovery, glass recovery, and sewage sludge composting, incorporated the more federally popular issue of wastewater with MSW, receiving $30 million in funding from the Federal Water Pollution Control Act and $8.8 million from the RRA’s Section 208. In Franklin, Ohio, the Black Clawson Resource Recovery plant used a technology called the Hydrapulper. Trash was fed into a container, which Hickman describes as a sort of “blender” filled with water, where it was pulverized. A barbed wire stuck into the mix would fish out items that did not get shred enough to become a part of the mixture. Glass and metals were screened out, and in the “fiberclaim” process, the rest of the mix was cleaned, “dewatered” and sent to the

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45 H. Lanier Hickman Jr., *American Alchemy: The History of Solid Waste Management in the United States* (Santa Barbara, California, 2003), 222; Despite the fact that the history of resource recovery is so recent, some of its important documents have been lost. Surprisingly, the EPA does not have its own archives. The records for EPA resource recovery projects were donated to “an engineering school” (according to EPA employee Donald Toensing’s e-mail). Toensing and McLaughlin both confirm that the materials were transferred from the school to SWANA. SWANA director Chris Hurwitz said that many of their old records were “recycled” when the association converted to an online library. Donald Toensing e-mail to author 26 July, 2006; Chris Hurwitz e-mail to author 6 March 2009

46 Chilton McLaughlin e-mail to author, 26 July 2006
mill to be turned into paper. The plant received $2.15 million under Section 204, but it suffered from mechanical troubles, and because the Federal Food and Drug Administration would not allow the MSW-based paper to be used in many products.  

Pyrolysis was one of the most promising types of resource recovery. In 1972, two of the four plants to receive Section 208 demonstration grant funding used the method: San Diego County’s Garrett-Occidental Research Corporation flash pyrolysis system, and Baltimore’s Monsanto Langard system. The Garrett plant in San Diego was significantly smaller, and it was older. The San Diego County Utilities Department received a federal grant in June 1965, to study "the feasibility of pyrolysis as an economic method of decreasing the volume of solid and municipal wastes and for producing useful by-products." The department determined pyrolysis to be beneficial for three main reasons: it would contribute a great deal towards extending landfill life, the process could be self-sustaining once it was started (see technique footnote), and that the by-products of pyrolysis "might have some commercial value." By mid-1967, the department was sending out bids to build a pyrolysis pilot plant, what would be the first one used for municipal solid waste in the United States. When describing the process in American City magazine, its coordinator emphasized, "We lay no claim to discovering anything new--except the proposed application to municipal wastes." Garrett, a subsidiary of Occidental Petroleum Corporation with its "Flash Pyrolysis" process was

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48 Abert, “Economics of Resource Recovery,” 1058; Third Report to Congress, 90
49 Donald A. Hoffman, "'Burns' Refuse without a Flame," American City 82, no. 2 (February 1967): 102.
50 ibid.
51 ibid.
chosen for the project, which received a $2.96 million grant in 1972 and was originally supposed to cost $4 million with expected revenues of $200,000 to $300,000 a year. It took six tries to site the plant due to community opposition. These setbacks delayed the project for three years and raised the price from $4 million to $9 million by the time construction was underway in 1975. Of the new costs, the EPA and Garrett were each paying $3.5 million and the county was responsible for $2 million.\textsuperscript{52} Garrett was a "turn-key" contractor for the 200 ton per day facility, meaning it set up the operation and were responsible for making sure it met the promised designed specification, but, in this case, the county would be responsible for operating the plant.\textsuperscript{53}

Although the Garrett system was "one of the more advanced (pyrolysis) processes," it did not succeed. It shut down in 1979 and ended up costing $15 million,


\textsuperscript{53} Levy, "San Diego County Demonstrates of [sic] Pyrolysis Solid Waste to Recover Liquid Fuel, Metals, and Glass," 159, 163, 165, 166. An explanation of the Process: Whereas the by-products of all pyrolysis methods are solids, liquids and gas, the Garrett Flash Pyrolysis system tried to get the most liquid byproduct (oil) possible, because of the easier markets for selling oil. In the Garrett system, waste was dumped into a shredder, which used a magnet to take out the ferrous materials. After settling in a storage bin, the waste went to an air classifier that had a stream of air entering it from the bottom strong enough just to catch the light materials and push them to the top. The heavy materials, which were mostly inorganic, went through a cylinder with a screen through which particles smaller than one-half an inch could fall. Those particles went through a chamber where they were crushed; the ones that were crushed enough went to the glass recovery areas, and the ones that were too big went back to the storage bin. The particles that did not fall through the half-inch holes were to go to an aluminum recovery plant or, if that were not available, a landfill. There is no way to separate glass and aluminum from trash except for by hand. Scientists or engineers make calculations about the weight and size of those materials and how much there ought to be by studying the waste stream.

The light material, after leaving the air classifier, went through a drier and then another shredder. Once it was finely shredded, the material would be blown into the pyrolysis reactor, a fat stainless steel pipe, which held the hot char. The amount of char in this one-second process was five-to-one over the amount of organic material, and the combination produced a gas-char mixture, which was then separated. The gas part of the mixture was quickly sprayed with oil (from the plant and a supplemental No. 2 oil as well), cooling it down nearly 800 degrees (to 175 F) to produce an oil of high-heat value to be sold as a product called "pyrol." The char and a portion of the gas that was not recovered continued to go through the pyrolysis system, continually providing the char to mix with the organic materials, making the plant self-sustaining.
never able to run continuously. The plant was supposed to convert the wastes of San Marcos and Escondido, California; its failure was not such a tragedy, though, because it was not the only disposal system in the area and the county was not reliant upon it to dispose of all its garbage. Although not as big, two other fairly famous pyrolysis (non-demonstration) plants that operated in the 1970s were the South Charleston, West Virginia, 180 ton per day Union Carbide plant which, ran from 1974 to 1978, and the seventy-five ton per day AndoTorrax Systems plant in Orchard Park, New York, which operated from 1971 to 1977. All of the plants eventually failed:

Development of the technology can be envisioned as an endless number of technical and mechanical problems and short- and long-term shutdowns. In most cases, redesign or modification of the system solved the problem, but other problems continued to appear. Even during periods when the plants were operating, there were problems in developing markets for the products produced. All of these factors worked together to increase processing costs to the point that other management options were chosen.

Fortunately, none of those communities with pyrolysis expected that their plant could take care of the majority of their solid waste disposal needs. This was not the case for the city of Batlimore, which hosted what would become the most notorious pyrolysis plant in the country.

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56 Howell and Jubran, "Civil Engineering Research."
The Baltimore Story

Just like so many other organizations, in the late 1960s, the U.S. military had become interested in resource recovery. David Sussman, a navigator and electronics warfare officer, was an executive officer in the Civil Engineering Squadron of the Air Force. Right after the second Earth Day in 1971, his air command, along with six others received a memorandum from the Pentagon telling them to, “Institute Pilot Solid Waste Recycling Program.” Sussman, who was also involved in operations plans, said his response was, “Oh, man! This is coming right from the Pentagon; this must be important.” He contacted EPA and Keep America Beautiful to learn how to start the program, only to find that there were not many existing efforts aside from those of groups like the Boy Scouts. Sussman developed his own program, collecting steel and aluminum cans, glass, and paper. He found local buyers in the Dallas-Fort Worth Area. Everything had to be contracted out through Redistribution and Marketing in the Department of Defense, but Sussman could use the returned money from any items collected that were not purchased by the military to buy things like “color TVs and drapes” for the squadrons. His ability to get the soldiers new resources from their discarded ones was “the thing that made (him) famous.”

After he retired from twenty years in the Air Force in 1973, Sussman was hired to join the EPA’s new resource recovery division, which according to him, consisted of “a bunch of kids with MBAs, [who] didn’t know squat.” In 1976 there were 27 professionals working in the Resource Recovery Division of the Office of Solid Waste Management Programs. Of the five engineers working on demonstration plants, Sussman

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57 Author Interview with David Sussman, Annapolis, Maryland, 11 August 2009.
58 Ibid.
59 Ibid.
was the only one without an advanced degree. There were two environmental and one civil and environmental engineering Masters degrees, as well as one Ph.D. in mechanical engineering. Two of the MBAs in the division were the Director and the Branch Chief.

Given the early emphasis on material recovery, it makes sense that there was a business influence in the division. Even though Sussman enjoyed finding markets for the recycled items on his base, the Air Force experience had taught him that energy was “the most valuable resource.”

The division immediately put him to work on energy recovery, and soon thereafter assigned him to the Baltimore pyrolysis plant, which had already been contracted under unusual circumstances. Most cities had "the requirement that the (resource recovery) method proposed must have at least three successful, full-scale installations elsewhere. Baltimore decided to abandon this safeguard and to build a plant for the pyrolysis of refuse on an unequalled scale." The city could not have gotten demonstration grant money by going with a tried method, but Hickman has noted that another safeguard was abandoned in the scale-up. “Good engineering practice seldom supports scale-ups much greater than 10:1,” he said. “If Monsanto had followed that, it would not have gone larger than 350 (tons per day).”

Baltimore, one of the first communities to adopt a sanitary landfill, had a history of being progressive with its solid waste. Sussman doubted the plan could work and was skeptical of all of its “moving parts.” The city, however, apparently with the support of its citizens, was "totally

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60 Hearings Before the Subcommittee on Transportation and Commerce, 29 and 30 June 1976, 115; Interview with Sussman.
62 Hickman, American Alchemy, 231.
63 Interview with Sussman.
confident in 1972 that private industry would have the technological know-how to build a successful waste disposal energy production facility.\textsuperscript{64}

Construction of the Baltimore pyrolysis plant began in January 1973, and the city even hired a graphic designer to ‘add pizzazz’ to the sprawling structure with, as the \textit{Washington Post} described, “its huge metal teepee, yellow silo, endless conveyors shooting skyward, spaghetti-like pipes, (and) bright orange graphics.” Although it looked nice, the plant was full of mechanical problems from the start. Conveyors, fans, ventilation systems and feeders all clogged and jammed, causing the whole plant to frequently shut down. Once, a fire broke out at the plant because the thick dust sparked with a machine in the shredding area. The fire department got the fire out but the shredded waste mixed with their water and created a giant \textit{papier mâché} ball. The city brought in a dynamite company, which tried a couple of times to blast the ball but to no avail. Finally, the city jackhammered the material only to find underneath that the shredding machine had gotten mangled when the dynamite exploded.\textsuperscript{65}

A nine-month shakedown period took place in 1975, after which Monsanto said the plant could not live up to the contract. Besides the technical problems, the plant’s inability to adhere to Maryland’s air quality emission laws complicated the process. Like many states, Maryland had been using a more stringent emission-regulating system than the federal government. The system was called the Empirical Kinetic Modeling Approach (EKMA). Baltimore tried to comply with the law, which froze all current

\textsuperscript{64} Francis Kuchta testimony to “Waste-to-Energy,” Joint Hearings Before the Subcommittee on Transportation and Commerce of the Committee on Interstate and Foreign Commerce and the Subcommittee on Energy Development and Application of the Committee on Science and Technology U.S. House of Representatives, 96th Congress, First Session, July 17, 18; and September 20, 1979, Serial No. 96-83 (No. 6--Vol. 8) (U.S. Government Printing Office), 289.

\textsuperscript{65} Interview with Sussman.
levels of emissions and stopped the construction of any new structure that would produce additional pollution. The standard was in place from 1973 to 1978 until economic struggles caused a shift in priorities.\textsuperscript{66} Under EKMA, the pyrolysis plant emitted seven times as much pollution as the state allowed, but Sussman told the city that was “not likely to present any danger to humans except under adverse climatic conditions, such as dead-air inversions or smog alerts. …. Otherwise, breathing it does not present any more hazard than simply breathing normal city air.”\textsuperscript{67} In just a few years that kind of statement would become fodder for environmentalists and concerned citizens, but it likely did not raise too many eyebrows at the time. Just as in St. Louis, the idea that a resource recovery plant would produce dangerous emissions was not a major concern throughout the 1970s. Implicitly reflecting America’s technological optimism, there seemed to be little doubt that new scrubbing technology could alleviate any major pollution concerns.

**Environmentalists and Technology**

This pervasive attitude about the ability of technology to solve problems gained resource recovery some surprising supporters, considering the trends of later decades. Even groups and individuals already concerned about the environment did not necessarily share Rachel Carson’s concern about technology. Members of conservation clubs who did worry about modern environmental concerns were often able to persuade other members to take up the agenda by emphasizing how these dangers could affect their conservationist interests. In some cases, members of bird clubs like the Audubon Society, as well as some hunters and other outdoorsmen got involved in new environmental issues because they innately identified with them. In other cases, those


who spent so much time in nature tried to move other members to the new causes by
drawing on their common wilderness experiences.\textsuperscript{68} The Sierra Club, the country’s
oldest preservationist organization, was one of the groups that did not completely
embrace Carson’s message.

In the 1950s and 1960s, under the leadership of Executive Director David Brower,
the Sierra Club, as Gottlieb notes, “sought to recapture (its) preservationist or
protectionist roots” and became increasingly politicized in the process. The Club fought
to protect areas like Dinosaur Park and the Grand Canyon, as well as to oppose power
plant siting efforts that located plants and their emissions near protected areas. These
actions which preserved “nature” from technology did not translate into automatic
support for Carson and \textit{Silent Spring}, because some club members did not see cropland as
nature. The organization, which had a generally white, financially secure and often
politically conservative membership, received letters from its own people defending the
chemical industry and the human good it was trying to achieve. Scholar Maril Hazlett
has stated that many industry people, as well as pro-Carson and anti-Carson Sierra Club
members all came to their beliefs from the “basic assumption … that human enterprise
and wilderness should remain separate entities.”\textsuperscript{69} Ultimately, for mainstream
environmental groups throughout the 1960s efforts to protect the wilderness warnings in
\textit{Silent Spring} trumped fear of the human hazards Carson presented.\textsuperscript{70}

It was not until after the first Earth Day, when the Sierra Club experienced a large
boost in new members who were interested in the growing national emphasis on
pollution, that the Club began to include human environmental issues in its agenda. The

\textsuperscript{68} Hazlett, “Woman vs. Man vs. Bugs,” 711-714; Gottlieb, \textit{Forcing the Spring}, 81.
\textsuperscript{69} Gottlieb, \textit{Forcing the Spring}, 77,80, 81, 328; Hazlett, “Woman vs. Man vs. Bugs,” 717.
\textsuperscript{70} Gottlieb, \textit{Forcing the Spring}, 313; Hazlett, “Woman vs. Man vs. Bug,” 703.
heavily fractured organization did not have any kind of unifying message that reflected the technological-weary position of Carson, however, and even had a pronuclear national president.\textsuperscript{71} When the club did take a stand against nuclear energy, Executive Director Michael McCloskey stated that the club had wanted to “believe in the promise of nuclear power,” and that the club was “not a collection of modern-day Luddites. We are not against technology. Our membership draws heavily from the ranks of scientists and engineers.”\textsuperscript{72} In this approach to environmentalism—rooted in preserving spaces and open to technology—resource recovery, and even just incineration, could be embraced with a fair amount of enthusiasm.

The concerns expressed in the Sierra Club’s Solid Waste Research Project were typical modern environmentalist concerns. The biggest problems were the leachate and other toxic substances that were emitted into the environment through landfilling. The number two concern was the large amounts of waste that Americans were producing. In a speech at the meeting, McCloskey said that conservationists have “avoid(ed) coming to grips with the problem of solid waste,” because they have seen it as a disposal rather than a material problem. True to the conservationist mentality, McCloskey stated that the potential of resource recovery could “be viewed in terms of lightening the drain on our raw material base…. Not only would accelerated resource recovery reduce the drain on virgin materials, it would also reduce the drain on our energy reserves.”\textsuperscript{73} Resource recovery was only the second best solution behind reducing waste. McCloskey concluded his speech with modern environmentalist sentiment, by saying that solid waste

\textsuperscript{71} Gottlieb, \textit{Forcing the Spring}, 203.
\textsuperscript{73} Michael McCloskey speech “Why the Solid Waste Problem is Worth Taking Seriously,” (Sierra Club Solid Waste Conference, Washington D.C. 16 November, 1974) Sierra Club Solid Waste Research Project, (pages 1, 8, 9 of speech ).
“is an index of waste in our attitude toward living … To the extent that we can learn to live more simply, more prudently, more efficiently, and more responsibly, we will begin to find our world to be more habitable again.”

Such notions would soon be echoed by pro-recycling forces.

Sussman was among the government representatives at the conference, which included several EPA agents, as well as educators, and social groups like the Consumers Union and the Movement for Economic Justice that showed how diverse the club’s interests had become. By far the most colorful speech of the workshop was the keynote address by Arsen Darnay, Deputy Assistant Administrator for EPA’s Solid Waste Management Programs and budding science fiction writer. Darnay did not discuss resource recovery at all. Instead he talked about his experience as an immigrant, which allowed him to truly appreciate the country’s wastefulness, which he said “approaches genius.” He said that Americans produce 150 pounds of waste per person per day! This included, “forest slash, field wastes; … lagoons of oils, acid, and tomato peelings; … hot stuff from our atomic power; plants; dead animals; diseased tissue, amputated arms….”

The speaker knew he was being dramatic but said,

Solid waste is drama. It is a flooding of our human ecology, our social system, by a river, an ooze of yiek. Our waste production is obscene—because it is an insult to the frugal adaptations that characterize every other living system wherever you find it. In all other complex systems wastes are used again. They are never considered wastes. Some creature stands by waiting to make use of it. Materials turn and turn in an eternal dance, always at work.

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74 Ibid., 10.
76 Ibid., 4.
Darnay called upon a belief in systems and ecological values to first minimize waste and then think of it as just a part of the system instead of something to relegate to the “national undertaker.”

The Sierra Club’s 1975 solid waste report officially accepted resource recovery as a salient solution to the waste problem. The report said that incineration was looking “much more attractive,” because of the volume reduction it offered and because of the “potentiality for recyclable materials recovery and for energy recovery from the heat of combustion.” The end of the report offered four tips for “What You Can Do” to improve the solid waste situation, and the fourth suggestion was to write your Congressman to “Encourage the development of energy and resource recovery programs.” With its elimination of dumps, conservation of resources and creation of energy, resource recovery fit well into mainstream environmentalist agendas throughout much of the 1970s.

Probably the largest organized solid waste discussion in the decade was the EPA-funded workshop entitled, “Citizens and Waste: The Citizen-Consumer, Energy and Waste: New Opportunities to Save.” The series was organized by an educational, consulting and research group called the Technical Information Project (TIP), and from August 1975 to January 1976, the workshop convened for two-day sessions in Denver, Boston, San Francisco, New Orleans, and Chicago. The goal of the 400 participants was to find out, “How can we adequately reduce, recover, and recycle our throwaways

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77 Ibid., 5.
78 “Solid Waste” Sierra Club Paper, (San Francisco: Sierra Club, 1975), 2, 6.
without major expense or dislocations?\textsuperscript{79} Representatives from labor, industry, business, government, education, as well as consumer (perhaps the most radical segment), environmental, and civic groups, including chapters of the League of Women Voters and the Sierra Club, joined the meetings.

Once again, different opinions did not equal entrenched ideology. Region played a significant role in the degree of proclivity towards resource recovery. A young Massachusetts Governor and future presidential candidate named Michael Dukakis “came out strongly in favor of high technology systems,” saying “Resource Recovery from solid waste is … achievable, do-able, demonstrably sensible.”\textsuperscript{80} Several of the elected officials at the meetings supported resource recovery, while audience reaction “was mixed.” Phil Stern of the Consumer Protection Division of the Denver District Attorney’s office suggested a “Trash-in” where environmentalists brought “paper and container trash to public parks, manufacturers, (and) school yards.” He also discussed the need for long-range idealistic goals, like reducing waste, as well as short-term goals like recycling.\textsuperscript{81} New Orleans, which was scheduled to get its own resource recovery plant, was the only workshop to host a debate; it was between the New Orleans’ Ecology Center and the National Center for Resource Recovery, which was engineering the city’s plant. The Ecology Center said it “favors resource recovery as part of a total waste management program,” but said the plant locked New Orleans into a waste generating scenario. “We have committed ourselves to an exacerbating, vicious cycle of waste

\begin{footnotesize}
\item[80] Ibid., 12.
\item[81] Ibid., 7.
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generation,” he said. Ultimately, however, the organizers concluded that as, “there is no shortage of waste,” there was room for waste reduction and recycling, as well as high technology and low technology solutions. About the participants, representing 24 states and Canada, TIP determined that, “All wanted to cooperate and interact to solve America’s waste problems. All had common agreement that depleting our limited material resources, polluting our environment, and endangering our health were consequences of waste that cannot be tolerated.”

**Resource Recovery and Conservation Act**

The Resource Recovery Amendment to the Solid Waste Disposal Act was set to expire in 1976. While there had already been some hints of divisions, the energy crisis forced everyone involved with the national resource recovery conversation to think about what they were promoting: a solid waste solution, a source of energy, or a way to conserve materials, which might have a value beyond their economic one. While Congress was having its last debates on the Resource Conservation and Recovery Act of 1976, Sheldon Meyers, the Deputy Assistant Administrator for the EPA’s Office of Solid Waste Management Programs was in Las Vegas, giving a speech on the “Goals of the Federal Solid Waste Management Program” to the International Public Works Congress. Meyers did not know what either the House or Senate were going to do with the bills they were debating, but no matter what, he said, the new legislation would accept that resource use, the environment, and public health were all “indeed interrelated.” He said that,

> On the surface, this may appear to be a small matter and something we have always known. If so, the surface

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82 Ibid., 31, 32.
83 Ibid., 47.
impression is deceptive. It wasn’t very long ago that Federal legislation was advocated which could have denied any Federal role in resource recovery or for that matter, in any aspect of municipal solid waste management. It was not very long ago either when the advocates of disposal and the advocates of resource recovery would line up like two opposing camps in a religious war. They still enjoy a skirmish now and then, but the war is over. The new legislation should provide the final coup de grace to such schizophrenia in the solid waste management field.\(^85\)

The “advocates of disposal” must have been the landfill owners and the solid waste companies that preferred the cheaper land disposal options. According to Sussman, waste management companies that owned their own disposal sites often donated to environmental organizations in order to gain support for landfills over other kinds of waste management.\(^86\)

There were no such ulterior motivations discussed during the resource recovery conversations that had taken place over the previous year. Politicians in the House, as well as Congressional witnesses called to testify on the proposed legislation had shown an incredible amount of general support for the ideas related to resource recovery: of saving resources, or creating energy, or saving land. Father Robert Drinan, another New England Congressman, carried on the tradition of Edmund Muskie. In March, 1976, the representative from Massachusetts introduced H.R. 12380, “To amend the Solid Waste Disposal Act to encourage research, development, and implementation of energy and resource recovery from solid waste, and for other purposes.”\(^87\) Iowa Representative Tom Harkin, whose hometown of Ames, Iowa, had recently completed its own resource

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\(^86\) Author interview with Sussman.

recovery plant, introduced a companion measure to Fr. Drinan’s Bill that would set up ten Regional Resource Recovery Institutes to make it easier for local and state governments with common needs to share information and work together.\textsuperscript{88} This type of negotiating and the discussions that took place portrayed a body of people all on the same page about the views of the human relationship to the environment and the need to manage the nation’s resources. It seemed it was only the tinkering over practical issues that needed to be worked out.

To different witnesses, the act meant different things. To some, the effort ought to have been pursued as a part of the national energy policy. To others it was an act towards greater environmental and public health. To others it was relief for the municipal solid waste headache. And to others, it closed the system that the U.S. industrialized society had left open.\textsuperscript{89} Floyd Fithian, the history professor turned Democratic representative from Indiana suggested that solid waste could supply 18\% of the country’s electricity needs, replacing between 400,000 and 500,000 barrels of oil a day. “To put it another way,” he said, “we are currently burning, burying, or dumping the equivalent of the combined total 1974 oil production of Alaska, Arkansas, Pennsylvania, Utah, South Dakota, North Dakota, and Colorado or the total production of coal from Pennsylvania all year.”\textsuperscript{90} Others suggested that a lower but still significant 10\% of electrical needs could be met with garbage.\textsuperscript{91}

\textsuperscript{88} Ibid., 46, 47
\textsuperscript{89} Josephy T. McColgan, President, Garden State Paper Co., Inc. Ibid. 30; Ibid. 8; Michael T. Blouis, Ibid., 11
\textsuperscript{90} Hon. Floyd J. Fithian, Ibid., 58
One of the major themes of the hearing was how best to handle materials that could be recovered for energy. Preserving paper, for instance, could also contribute to savings of the national energy budget, up to .3%. Additionally, the U.S. was importing paper and other materials just as it was importing oil. Of the nine million tons of newsprint the country consumed in 1975, two-thirds of it was imported from Canada. The United States relied on foreign countries to supply over half of the amount of twenty-three of its thirty-eight “strategic materials.” West Virginia State Senator Walter Neeley said the danger of “cartelization” existed for any of those materials, just like it did for the oil exporting countries. The fact that the U.S. recovered only three percent of its glass, 3.5 percent of its aluminum, and two percent of steel scrap except for that from autos, seemed particularly harrowing in light of potential foreign threats.92

Many scholars and writers who have discussed trash have off-handedly claimed that paper recyclers and resource recovery proponents were enemies because they were competing for the same resource. The Solid Waste Management and Resource Recovery Hearings before the Subcommittee on the Environment and the Atmosphere prove this assumption to be a falsehood. The only realistic disposal alternative at the time was landfilling, and paper recyclers had no preference for the landfill. The President of the Garden State Paper Co., Joseph T. McColgan, testified at the hearings of the tremendous cost of landfilling paper. If five million of the 56 million tons of paper consumed in 1975 were recovered, it would save the country’s cities up to $125 million a year in collection and disposal fees, and the sale of all of the recovered material would generate $100 million, giving back a total of $225 million. The recycler considered paper similarly to

92 Fithian, “Solid Waste Management and Resource Recovery,” 72; Bruce Butler, Counsel for the Institute of Scrap Iron and Steel, 29; Neeley, 168
the way resource recovery proponents saw solid waste: in terms of money, materials and energy. The paper industry estimated that the growth of Third World markets would increase world paper consumption from 160 million tons to 260 million tons by 1985. Additionally, they expected that the U.S. would be harvesting more paper than it grew by the same year.  

McColgan did say that,

It has always been our feeling the highest economic value of paper is having it recycled as paper rather than having it burned. We have concluded in our study, and the indication from our facts, if they are correct, is that there is a net BTU savings in the recycling of paper as opposed to burning it for energy. Where you have a net BTU pickup, it seems to me you are far, far more advised to recycle it rather than burn it.

If there was no one to buy the recovered paper, however, then there was no benefit to the BTU savings. In these cases, McColgan stated that, “what you have here is a very good opportunity to couple resource recovery front end with energy, tail end, because when the market swing is such that the demand for the recycled material is not there, you channel it off, and you use the option to burn it for energy.” This comment hits an angle of resource recovery that current scholars who try to lump the process with incineration ignore. Resource recovery always recovered resources, either in the form of BTUs, dollars or materials. It was not the case that one priority would always trump the others; there was flexibility and rationalization in the process. One could get something out of paper, McColgan was saying, either as paper again, in the front end, or at least in the tail end by using it directly as a source of energy. There may be a net loss of BTUs by using

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93; McColgan, Solid Waste Management and Resource Recovery Hearings, 30.
94 Ibid., 34-35.
95 Ibid., 35.
it that way, yes, but if the paper were landfilled or reclaimed but not sold, there would be even greater losses.

There was a fundamental belief among many resource recovery proponents that economics would dictate what need was greater between energy and material resources. David Gordon Wilson, a professor of mechanical engineering at M.I.T. credited OPEC with bringing about “a great deal of recycling in this country” by making it worthwhile for companies and communities to consider the end use of products. He continued, “It is not the recycling that I was working on because I would rather in some way see materials used for intermediate processes rather than energy, but it is recycling [by energy conversion] and that is all to the good.”96 Not only were the paper people willing to work with the resource recovery plants, but the reverse was true as well. James Abert said that according to the National Center for Resource Recovery’s calculations that if paper could be sold for over $15 a ton, it would worthwhile to use it for secondary fiber, but if it could not sell for that much it ought to be used as fuel.

Finally, after a certain point, the only way to get more uses out of some items was by converting them to energy. As Representative Fred Rooney of Pennsylvania said, the bill sought “to conserve our valuable energy resources by promoting the use of waste, which has no other value, as fuel.” It was not all waste that would be converted to energy, but only waste with “no other value.”97 Paper fibers lose their strength and cannot be reused after so many times of being recycled. Even if recyclers continue adding new fibers to batches, the old ones will eventually become very weak. Instead, paper companies removed some of the old batch and replaced it with newer materials.

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96 David Gordon Wilson, Professor of Mechanical Engineering, MIT, Resource Recovery and Conservation Act Hearings, 103.
After this long life of use and reuse the paper has lost its value as paper. At this point, resource recovery proponents said the wisest material use would be to burn it for energy. This applied to other material besides paper, as well. 98 As James Greco from the National Solid Waste Management Association, stated, “If your question is are we faced with either energy or materials recovery, I think the answer is that the two are almost compatible.”99

**Accounting with Energy**

One of the most technical and talked about views presented at the Hearing was the energy analysis of Dr. Stephen Berry from the Department of Chemistry at the University of Chicago. Berry presented the Congressman with an essay entitled “Energy Husbandry: Laws of Man and Laws of Nature.” His overarching premise was that all decisions about how to use a resource could be determined with calculations. He said that humans usually find resources in an “oxidizing” state that is not generally usable, and they process them to bring the resources to their optimum state for human purposes. Once people use a processed item, they discard it and it becomes waste, starting the journey back to its original, oxidizing, more stable state. This is a downhill slide, and Berry said people could let materials slide back into the state they found them, or they could “take advantage of the fact that we still have them in a relatively valuable state when they first become waste.” Because all material use boils down to “a continual process of winning resources from the state in which we find them,” then all decisions

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about resource use could be made on the basis of energy calculations: how much energy
does it take to “win” the resource from its original state; how much energy could be
saved by reusing it; how many times can it be reused; how much energy would it take to
use a substitute product? The professor talked about a “library of possible tradeoffs” that
could be decided upon using “serious, hard, scientific calculations.”

For Berry, waste paper and plastic were particularly good resources to use for
fuel. It took less energy to burn waste paper that had already been processed and used
than to retrieve and process coal or refine oil. Plastic was an especially good source of
fuel, because it was made of petroleum. If petroleum was used directly as fuel then it
must be processed for a one-time use. If it were turned into plastic, then it could be used
as many times as possible without reprocessing until finally it was burned directly as fuel,
getting many uses out of one processing. In aphoristic terms, it was the journey, not just
the destination that determined the best way to utilize resources. Reprocessing all
plastics or all waste paper at a recycling plant could be a worse choice than burning for
maximizing energy. It was not always worth fighting all materials’ decline with more
energy expenditures. That is why one had to do calculations to determine the best way to
handle resources.

Berry said that his method of calculating resource decisions strictly on energy use
was a version of economist Hollis Chenery’s “engineering production function,” which
“only really became useful under the impact of sharply rising energy prices in 1973. To a
scientist, it is a method of bookkeeping of physical quantities.” Converting all entities
in a system into units of energy was also a method used by America’s most famous

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100 Stephen Berry, Solid Waste Management and Resource Recovery Hearing, 63, 84, 78, 60, 86.
101 Ibid., 72.
102 Ibid., 86.
ecologist. Howard T. Odum, an environmental engineer at the University of Florida at Gainsville, released his energy analysis book *Environment, Power, and Society* in 1971, right as the country’s energy problems were gaining notoriety. By 1975, Odum had become so connected to energy analysis that *Newsweek* called the method “Odum’s Law.”

Like Commoner, Odum was an adherent of cybernetics. His teacher, G. Evelyn Hutchinson, was the founder of systems ecology and believed that if one looked at a community as an organism “it should be possible to study its metabolism.” This influence can be seen in his pupil’s energy analysis methodology. Odum argued that “Western culture” had been able to experience economic growth for the past 200 years because of colonization and the discovery of new energy sources and new spaces. Once all of the “energy flows have been tapped,” Odum, citing his intellectual influence biophysicist Alfred Lotka, said, “Those systems win that do not attempt fruitless growth but instead use all available energies in long-staying, high diversity, steady state works.” This efficient use of energies, he considered to be the “maximum power principle” or the “fourth law of thermodynamics.” Odum believed that economists could not understand steady state economies because neither they nor their teachers had ever seen a steady state, “even though most of man’s million year history was close to steady state.” Consequently, ecologists, who had observed steady states in nature, were qualified to discuss and were important for conversations about budgeting resources.

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Scholar Peter Taylor has written that Odum’s belief that “nature could teach us how to design well these ‘systems of man and nature,’” led Odum and his influence “outside the boundaries of the academic discipline of ecology.”

The significance of this, as Taylor argued, is that Odum turned systems thinking, which was intended to be “metaphor,” into fact. If one looked exclusively at processes as energy transfers, they would miss looking at it in any number of other ways. Taylor wrote that

Other cyberneticists and ecosystem theorists explored different measures of system structure … but Odum insisted on energy as his currency. Information and monetary flows were simply equivalent to high-quality energy flows. Energy provided a link to real, nonabstract physical systems and also, via the maximum power principle, to the power and status of thermodynamic principles.

There was a danger in wearing any kind of goggles, including energy-goggles, when looking at societal problems. Accepting such a focused vision, surrendered any chance to have a voice or object on different grounds later. All other values and issues got lost at the expense of the one. This might be one reason why Commoner, a fellow holist and cyberneticist, who believed the pursuit of energy was at the root of many of society’s problems, did not talk about energy systems in the same way Odum did. Commoner applied systems thinking to scientific issues, but saw social issues as moral and political.

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107 Taylor, Unruly Complexities, 67.
108 Taylor, Unruly Complexities, 90.
109 This statement seems fair in light of the fact that he has spent his life trying to educate the public about technological risks. See Michael Egan, Barry Commoner and the Science of Survival (Cambridge: MIT Press, 2007) for more about Commoner and his life.
Even Dr. Berry, who testified before Congress about the great value of energy analysis to solve policy debates, was leary of thinking about the issue too narrowly. At the hearing he stated that his research group felt that as time went on human material use would become more efficient and “closer and closer to the value of thermodynamics.” He immediately backed off that sentiment, however, and said, “But, no, I hope that there will always be a difference between the two. I don’t want to see us become a sort of ideological technocracy.” Systems became less popular as time went on, as Taylor wrote, “When compared with the immediate postwar context, the social and practical conditions also became less conducive to acting as if entire ecological systems could be analyzed and managed.” Systems thinking might have been able to provide resource recovery proponents, especially engineers and scientists, with a strong justification for their cause, but issues like pollution and property values, things regular Americans were very interested in, did not play a big enough role in that kind of analysis to be able to convince nonbelievers.

**Other Garbage Mentalities**

The kind of micromanagement of resources that “Energy Husbandry” signified, however, was reminiscent of the *bricoleur* ethic that Susan Strasser discussed in her book *Waste and Want: The Social History of Trash.* If *bricolage*, or the ability to make good use of the materials on hand, went by the wayside as the consumer mentality took over the American psyche, then resource recovery was one kind of return to a frugal, resource-conscious attitude. In this case, however, it would be only a few, mostly

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10 Berry, Solid Waste Management and Resource Recovery, 84.
engineers, scientists and economists, who would have to understand and to manipulate materials to achieve their maximum value. This technocratic nature and the highly technological equipment involved, separated resource recovery from other *bricoleurs* like the Appropriate Technology advocates, whose environmental solutions were more accessible to lay individuals.

None of this is to say that everyone who spoke before Congress supported the bill or government’s plans to expand the funding of resource recovery. Particularly controversial were the loan guarantees for resource recovery companies working with state and local governments and not addressing the subsidies of virgin materials that existed in the market system. Many thought the government had funded enough projects, and more funding would be of no benefit. Others were not opposed to resource recovery as a later or last resort but wanted to emphasize the importance of individual conservation, as well. Neil Seldman of the Institute of Local Self-Reliance opposed any high-tech solution and would continue to do so for the next 35 years. Seldman was the minority, however. No one else completely wrote off the idea of resource recovery. Even Blakeman Early of Environmental Action, an environmental lobbyist, said he was “presenting the cautious view rather than the skeptical view,” because his organization felt “some optimists are ignoring some genuine problems which should be solved before widespread use of these technologies takes place.”

Most of the speakers, however accepted it as the best possible solution to waste disposal at some point in the life of a product, although they approached the solution with varying degrees of emotion from gladly to reluctantly. Considering the diversity of

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ideology, politics and backgrounds that were present at the meeting, this was no small statement. If one were to questionably argue that such a hearing, by its nature, was bound to the establishment and that the witnesses chosen to speak were naturally going to have similar world views, that person would still have to admit that such a world view should be reflective of that of the majority of American people, as the House of Representatives are the most frequently voted upon national representatives. In light of these considerations, it appears that the hearing and the testimonies reveal at least two truths about the United States and its relationship to the environment: Americans had remained technologically optimistic, although perhaps somewhat more cautiously so, and Americans were not entirely comfortable with the profligate wastefulness that they had been practicing. They might prefer, however, to have someone else manage the remnants of their consumption than to do it themselves. This desire is not necessarily irresponsible or immoral.

Wilson’s response to making the issue of waste moral or immoral is similar to garbologist William Rathje’s in his book *Rubbish! The Archaeology of Garbage*. Wilson said that, “We tend to seem to regard everything as good or evil or guilty or not guilty.—Of course most of these processes and most of these factors in our daily lives aren’t either guilty or not guilty, they are processes that bring some benefits and some disbenefits, some diseconomies.”¹¹⁵ Rathje, writing in the 1990s, also talked about the benefits and disbenefits, saying that society has to have waste for many modern amenities like doctors who wear disposable gloves and, when possible, don’t reuse the same instruments on different patients. Additionally, modern garbage practices, even if they are lacking the lower-level *bricolage* of the past, had moral implications that went beyond just the

management of materials, according to Rathje. Having people scavenge through the garbage and reclaim what other people have discarded was an effective means of recycling for much of history and is used in developing countries today, but the idea of the poor and children rummaging through unsafe garbage dumps is not really "compatible with other desirable social ends-economic development, modernization, and human dignity, for example." As these thoughtful and increasingly complex positions on waste and resources were being seasoned in the minds of interested parties in the mid-1970s, the practical failures of resource recovery plants, especially the Baltimore pyrolysis plant, would lead to a policy change that drastically decreased the levels of complexity in the machines themselves and a governmental push to pursue machines that could recover energy, period.

By June, the new, more-encompassing bill was the Resource Conservation and Recovery Act of 1976, also called H.R. 14496 or RCRA, “A bill to provide technical and financial assistance for the development of management plans and facilities for the recovery of energy and other resources from discarded materials and for the safe disposal of discarded materials, and to regulate the management of hazardous waste.” The ambitious goal of this bill was “the proper disposal of all materials after their intended use.” It also established a United States Resource Recovery Corporation, a

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116 William Rathje and Cullen Murphy, *Rubbish! The Archaeology of Garbage* (New York: Harper Collins Publishers, 1992), 40; Howard Odum might not agree that this type of improvement was unquestionably good. By improving health care, life expectancies were extended and more burdens were put on resources. As he says in his essay, “Energy, Ecology, and Economics,” “Many economic models ignore the changing force of energy regarding effects of energy sources as an external constant. …the false gods of growth and medical ethics make famine, disease, and catalytic collapse more and more likely for much of the world.” Howard T. Odum, “Energy, Ecology, and Economics,” ENFO Newsletter.

117 Fred B. Rooney, Resource Conservation and Recovery Act of 1976, “Hearings Before the Subcommittee on Transportation and Commerce of the Committee on Interstate and Foreign Commerce House of Representatives, 94th Congress, 2nd Session on H.R. 14496, June 29 and 30, 1976, Serial no. 94-
government nonprofit corporation that could negotiate contracts, handle legal issues, and provide financial assistance, especially in the form of loan guarantees, to those pursuing resource recovery efforts. As Baltimore would show, however, even the most comfortable financial cushions were often not enough for a city counting on a solution.

**Back to Baltimore**

At the end of 1975, Baltimore and Monsanto signed a supplemental agreement, forcing Monsanto to pay the $4 million guarantee money. Soon afterwards the project got another $1 million grant from the EPA. Just as Mayor Schaeffer had expected, municipalities across the country were watching Baltimore and its experiment. A sales manager for Monsanto said, “We get a lot of tire kickers, but most cities want to wait until the Baltimore project checks out.” Before the new test runs in 1976, Monsanto’s project manager said the company still thought it could make it work. “If we didn’t think it would work, we never would have invested the money … The Baltimore plant hurt our marketing plans and cost us a pile of money, but we think in the long run it will be worth it. There’s a huge market out there, and it’s not just for burning and burying.”

The manager may have been right about the market, but he would soon change his mind about the investment being worthwhile for the company. The kiln broke due to excess heat during test runs in May through July 1976. Even after everything was fixed to Monsanto’s specifications, the company could not get the kiln to run for more than eighteen straight days. On February 1, 1977, Monsanto recommended that the plant be abandoned as a pyrolysis plant, and less than a week later it pulled out of the project. The

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Mayor called the company, ‘a bunch of common bastards (who) sold us a bill of goods.”

The city, which needed the plant to process its wastes, modified it into an incinerator which opened in May 1979. An editorial in The Sun after the re-opening showed the resentment still harbored against Monsanto. “City workers have turned a monumental flop into at least a partial success story in getting the previously paralyzed pyrolysis plant back into production after the Monsanto Company had abandoned its defective brainchild.” The plant was able to incinerate 600 tons of waste per day until it was finally abandoned in late 1980. It ended up costing $26 million and would have a detrimental effect on the future of resource recovery and the legacy of pyrolysis. After the failure, the director of Maryland Environmental Services stated that, “Just the word pyrolysis makes people nervous.” Baltimore, too, had learned a lesson. As the city’s Public Works Director stated, "A city can't afford to experiment. Cities need a sure thing. They don't have money to throw away ... Solid waste is a sure thing. It isn't going to go away."

Despite being the major investor, Sussman, who remained with the plant until the very end, and the EPA did not harbor the same resentment towards Monsanto or much disappointment in the failure. “It’s a demonstration project,” Sussman said, “and a demonstration project is supposed to demonstrate the success or failure of whatever you’re demonstrating, and I used to go around telling people, it was a successful

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123 Peterson, "Baltimore's Plant is Costly Failure."
demonstration project: it demonstrated that the technology does not work, so nobody else is going to spend money on it, which to me was, you know, was ok.”

While Sections 204 and 208 of the Resource Recovery Act had funded the demonstration plants, the idea of model technologies was part of the federal government’s efforts in the 1970s to encourage intergovernmental cooperation to “take root and flourish.” From 1966 to 1983, the Office of Management and Budget’s Project Circular No. A-95 was the vehicle for that cooperation. The Circular, which the Office of Management and Budget (OMB) stated was a “means to secure State and local inputs to Environmental Impact Statements,” created 540 Project Notification and System Review Clearing Houses, which could share information about one level of government’s plans and technology or jurisdictions with other interested parties. From 1965 to 1976, the Office of Solid Waste Management Programs had produced over 800 publications and articles meant to educate “public officials and the scientific, academic, technical and lay communities.” Despite the assistance and the cooperation mentality, by the late 1970s the high-tech systems that emerged throughout the decade had proven to be too complicated for most local governments. Solid Waste Management magazine wrote in 1977 that “Too many communities and states do not have a real understanding of the myriad legal issues involved before they go galloping after a municipal solid wastes processing facility.” The EPA was planning even more information distribution later that year, however, releasing an eight-volume series of resource recovery implementation

124 Sussman Interview.
125 “OMB Circular No. A-95,” 38, 2, 18 University of Maryland Special Collections, Baltimore Environmental Center, Box 7, Grants-Miscellaneous.
guides, and over 100 new tapes, speeches, press releases, films, articles, and other publications. These resource recovery efforts were in addition to the general waste management programs like the Collection and Management Information System, which tracked waste collection processes and the computerized Injury Reporting Information System, a database of injuries sustained by waste collectors.\textsuperscript{128}

As Baltimore and the rest of the demonstration program’s failure seemed increasingly imminent, Sussman and his boss Steven Levy went to Europe in 1977 to survey European mass burn technologies, which had many fewer parts and less waste separation at the plants. The trip would shift America from resource recovery to waste-to-energy processes. Sussman recalled,

\begin{quote}
I saw the first of those plants and I thought, “What in hell are we doing? We’re crazy!” I mean here’s the technology—we knew about it, we turned our back on it. You get guys like Steve Levy, who was my boss for awhile, who went to Georgia Tech and was a great engineer, and he said, “You know that technology’s 20 years old. We’ve got to have something new and better.” Well, we didn’t have anything new and better, and I saw this—I don’t know how many plants I saw the first trip—and I came back from that trip and gave my trip report and said, “you know, we’ve got our head up our whatever and we need to transfer that technology to America,” and the Department of Energy said basically the same thing, and we both went over, DOE and EPA, to study the technology and bring—technology transfer—bring it back here.\textsuperscript{129}
\end{quote}

After the report, EPA began to wind down or scrap the remaining demonstration plants, and the federal government gave four U.S. companies, including Ogden and Wheelabrator, each the right to produce one of the European-style systems. The new focus was almost entirely on energy. Some of them separated out aluminum, but that was

\textsuperscript{128} Meyers, “Goals of the Federal Solid Waste Management Program,” 9, 10.
\textsuperscript{129} Interview with Sussman.
about the only material resource to be recovered in the new waste-to-energy (WTE) plants. Europeans separated their trash themselves, so there was no need to have a high-tech facility separate the waste.

With that—a combination of several small failures, one massive fiasco, and an eye-opening trip to Europe full of waste disposal plants that got rid of solid waste without much complexity, controversy or hassle—all of the lofty thinking and planning and prioritizing and rationalizing that went into America’s resource recovery idea had come to an end. It would take time for the remaining resource recovery plants to peter out, but most of them would by the end of the 1980s. Resource recovery’s immigrant cousin, waste-to-energy, would not win the hearts or imagination of Americans in the same way the native version would. It proved much easier to speak out against converting materials to energy than it had been to speak out against the chameleon-like label “resource recovery,” which ultimately covered many different waste management priorities.

The spirit of resource recovery did not completely die, however, and there was one plant that would survive into the 21st century. Gerald Ford’s last legislative act before the 1976 election was to sign the Resource Conservation and Recovery Act. Although, as Lanier Hickman wrote, the act “represented a dramatic increase in federal authorities in solid waste management” that didn’t translate into a dramatic increase in resource recovery efforts. The act had plenty of opportunities for funding, but the EPA retained its preference for focusing on hazardous wastes. At least 20% of the bill’s funding was supposed to go towards resource recovery, but EPA never asked for the money and Congress never made it.130 It was under another president and another energy crisis that resource recovery was briefly resuscitated as one of a myriad of possible

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130 Hickman, American Alchemy, 70.
solutions that Americans thought would help address their environmental and energy woes.
Chapter 3: The Ames Anomaly in the Crisis of Confidence

At the Solid Waste Management and Resource Recovery Hearings, no elected representative was prouder of his or her state’s resource recovery accomplishments than Iowa Representative Tom Harkin. “Mr. Chairman,” he said to Representative George Brown,

you and the other members of your Subcommittee may have already seen the ad which appeared in some of our national magazines, such as Time and Newsweek. It says, “A Small Town with a Pretty Big Idea,” and it has the town marker of Ames, Iowa, which is my home town. Ames has a population of 39,500 people. It is right in the heart of the farm belt; it is the home of Iowa State University.¹

The folksy advertisement Harkin referred to said the “small-fry” of Ames was converting “corn cobs to kilowatts.”² The refuse-derived fuel facility was actually very similar to Union Electric’s plant in St. Louis. Unlike St. Louis, however, the municipally-owned Ames plant would not face crippling community opposition or have to deal with a powerful utility with its own agenda. Unlike Baltimore, the “small town” would not have a huge scale-up that was likely to lead to mechanical failures. While many other states had some kind of resource recovery plant, the Iowa representative was right to be proud. His hometown plant was truly an anomaly in the resource recovery field, and would last well beyond what was expected.

A 1976 study sponsored by NASA stated that “to operate efficiently” a resource recovery plant would need to process a minimum of 500 tons of waste per day. To attain

¹ Tom Harkin, Hearing Before the Subcommittee on the Environment and the Atmosphere of the Committee on Science and Technology U.S. House of Representatives 94th Congress Second Session, April 7, 8, 12, 13 1976, 48. According to Harkin’s website, he was born in Cumming, Iowa, and worked in Des Moines in his youth. He attended college at Iowa State University, available from http://harkin.senate.gov/abouttom.cfm, accessed 20 April 2010
² Ibid., 49.
that much waste, a city would generally need to have at least 250,000 people or to take a regional approach with nearby towns.\(^3\) Ames did take a regional approach, contracting

with nine neighboring communities and Iowa State University to host their garbage, but that still did not come close to the 250,000 population. Was Ames still efficient? That would depend upon who was asked the question and when they were asked. The nine surrounding communities that were locked into expensive contracts for twenty-five years probably would have said “no” for many, if not most, of those years, but when the contracts expired, they all renewed. Barry Commoner did say “no,” if efficiency were looked at with a lens wide enough to include the global ecosystem. The politicians, city employees, and many of the citizens of Ames, who would not have to deal with landfills or siting issues for almost forty years and have saved hundreds of acres of Iowa farm land from becoming dumping grounds, would undoubtedly say “yes.”

In 1973, *The American City* magazine ran a story called “Solid Waste Disposal—Five Years to Doomsday,” comparing the garbage situation to the “nuclear clock of the atomic scientists which warned civilization that only five minutes remained before extinction.” Should cities simply do nothing because they cannot reach any consensus, the article asked. “The little Iowa city of Ames doesn’t think so,” the author wrote. “Ames is unafraid. It has agreed to receive refuse from nine other nearby municipalities. It will use this refuse as a fuel to generate electricity in its municipally-owned power system, sulfur free, incidentally.”\(^4\) The resource recovery plant has remained a source of pride for many in Ames, and compared to similar plants, it has experienced relatively little local controversy for most of its life. Still, the city has reframed the image of the plant several times, highlighting different aspects to mesh with contemporary environmental values. The plant’s own brand of efficiency came largely from the

qualities that Representative Harkin used to describe his city: its small size, its farm ties, and the mentality it shared with the local engineering university. As larger plants began to receive a bad rap from environmentalists, and NIMBY-ism changed from just a property value issue to a fear issue, each of those qualities would allow the Ames plant to remain efficient enough to be justifiable.

The idea for the plant began germinating in October 1971, at a city council meeting, when councilmember Ray Fisher suggested that Ames look into an “experiment in waste disposal” he had recently seen that might save the city some money.5 Affluence and changing disposal laws had affected Ames the same way they affected larger cities. By 1970, the Ames landfill contained 6,000 junked cars, the product of a society so rich it was more likely to throw away than to fix up something as expensive as a car. Even after the city removed the vehicles, the landfill was expected to be full by 1975, so Mayor Stuart Smith assembled a solid waste task force to look for new sites very early in the decade.6 A new landfill would need to meet the state requirements that the EPA mandated. The city estimated that the price to dispose of trash would increase from $1.50 to $2.50 per ton in a regulated landfill. Ames was not the only small town running out of landfill space. Smaller, neighboring communities were also out of room and not yet prepared to site or fund a new landfill. Before hiring the consulting firm of Gibbs, Hill, Durham and Richardson in October of 1972, Ames had implemented a “stop gap” solution earlier that year, agreeing to take all of Story County’s garbage for $3 a ton. It was far easier to pay a little more than to have to come up with a new solution in such a

5 Ames City Council Meeting Minutes, 19 October, 1971, Book 22, 212.
short time. The *Ames Daily Tribune* editorial board agreed that Fisher’s “experiment” ought to be investigated because a new landfill could cause water pollution and would take “enormous amounts of space.”

Ames had plenty of sparsely populated adjacent land, especially compared to larger cities. Its population was rising quickly, but it still had not cracked the 40,000 mark. During the first three years of the 1970s, however, the city was involved in an annexation debacle. The city council tried unsuccessfully to annex 23 and then 19 square miles of land surrounding the community. The council held two referendums in less than a year to try to push the issue through. The efforts failed both times, and the council indicated there could be a third referendum in another year. New council members, however, squashed further annexation efforts. Consequently, prospects of sewer and water services being expanded to areas outside the city limits were dim, and developers focused growth on land within Ames. Still, Iowa farmland was cheap compared to areas on the coast, and it would not have been uncommon to put a new landfill on the outskirts of a town. Additionally, a resource recovery plant would initially be costlier for Ames residents than even a new landfill. Planners projected the disposal fee for a resource recovery plant would cost $2.69 a ton with hopes that it would drop to a mere 60 cents a ton in about a decade. The general rule of thumb was that one ton equaled one person’s waste for the year, and so citizens would pay that fee in addition to their regular trash-pickup bill. Area leaders met and devised a plan for all participating communities to pay the same price, so everyone in Story County was getting a small bargain compared to

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their previous agreement. While Ames had local reasons to consider resource recovery, a new environmental ethic, along with the national energy and farmland crises that occurred between that October 1971 council meeting and October 1973, when construction began, would become more important than price or annexation issues in the city’s justification for the plant.

**Conserving the Land**

As with others across the country, Iowans were starting to consider their role in environmental issues in the early 1970s. A new pamphlet from the U.S. Foreign Policy Association had just come out called, “MAN AND HIS ENVIRONMENT—What Price Survival?” and the *Ames Tribune* said that

> Scores of Iowa programs dealing with this universal challenge are gaining momentum. The press, radio and television are giving it major play. Pastors are emphasizing the Ecological Crisis. Youth are finding handles to take hold of in tackling the proposition. Leaders in industry are recognizing that ‘the first responsibility of business is to operate for the well-being of society.’

The local paper was full of articles concerning world hunger and other environmental issues. In October 1971 alone, two speakers came to Ames to discuss population and the earth’s carrying capacity. One of them, agricultural expert and former Iowa State University student and professor, William C. Paddock, visited his old school to warn about the pending food crisis. Paddock said that a food crisis in 20 or 30 years was

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“unavoidable.”\textsuperscript{11} Even though scientists had made great technological advances there was still only a certain number of people the earth could feed, he claimed, besides the fact that the rest of the world lacked this country’s agricultural savvy. Paddock, rather ethnocentrically, told the reporter that if one square mile of Iowa was transported to Latin America, they “would make a park out if it,” because, “they don’t know how to use the soils.”\textsuperscript{12}

Farmland was a resource that had to be managed just like other limited resources that worried conservationists, and it was a prevalent concern throughout the country in the early 1970s. Farmers, who had been used to restraining crops for the past several decades because of government policy, suddenly had to bring millions of acres back into production. Nixon’s Secretary of Agriculture Earl Butz encouraged farmers to grow as much as possible, so the U.S. could export the grain to desperate countries around the globe, especially the Soviet Union, and help the country’s trade balance in the process.

In his book \textit{Public Values, Private Lands}, historian Tim Lehman wrote that concerns about soil erosion and fuel shortages became prevalent just as farmers were called upon to feed the world. “This volatile mixture of political, economic, demographic, and environmental change,” Lehman argued, “forms the backdrop for the United States’ second attempt to plan for the use of American farmland.”\textsuperscript{13} The first attempt occurred in the 1930s during the Great Depression, while the second began in the 1970s. In light of the growing needs and concern over future resources, it would have been foolish and wrong to turn good farmland over to garbage.

\begin{itemize}
\item \textsuperscript{11} (no author) “Warns Food Crisis Unavoidable,” \textit{Ames Daily Tribune} 12 October 1971, 1; (no author) And Animals Don’t Have the Pill,” \textit{Ames Daily Tribune} 29 October 1971, 1.
\item \textsuperscript{12} “Warns Food Crisis Unavoidable,” 8.
\end{itemize}
Some areas of the state, including Story County, instituted farmland conservation measures during the decade to save what was “widely regarded as some of the most fertile corn land in the nation.” In 1977, the county implemented a zoning plan based on a “corn suitability rating.” Planners wanted to stop urban sprawl from taking up cropland, so they rated parcels of land on a scale of 1-100 for their conduciveness to growing corn. The county found that it could meet expected growth through the year 2000 by only allowing the development of land that scored 62 or less on the scale, even though 93% of the county’s land scored higher than 62. Not everyone bought into the farmland conservation arguments, including Earl King, the president of a rural power coop called Allied Power that was trying to find a willing host town in central Iowa for its power plant in 1979. King said there was a “bit of phoniness” in the farmland preservation efforts. He pointed to Iowa State’s new Jack Trice football stadium, where, he said, “they play six home-games a year and they don’t even use it for practice. They park thousands of cars around there for 20 hours a year to watch a couple of teams play football.”

Many people, in fact, shared King’s skepticism. Although numerous studies about the nation’s rapidly diminishing supplies of farmland were released in the early 1970s, “little evidence was produced to show that the overall level of agricultural output or the integrity of the agricultural economy was being seriously affected.” Geographer Michael Bunce pointed out that farm problems in the 1980s would be the result of

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14 Kent Parker, “Farm Land Squeezed in Urban-Rural Vise: City Sprawl Feeds on Acres,” Des Moines Register, 15 July 1979, 7A.
15 Parker, “Farm Land Squeezed,” 1A, 7A.
16 Bud Appleby, “Farm land Squeezed in urban-rural vise: Power Plant Sparks Dispute,” Des Moines Register, 15 July, 1979, 5A.
“overproduction and global competition rather than land shortages.”

Like other environmental fears, overpopulation for instance, the fact that the dire predictions did not come to fruition within a certain period of time did not mean people stopped being concerned. As Bunce said,

> At its height between the mid-1970s and mid-1980s, then the farmland preservation discourse was dominated by the language of resource scarcity. That the arguments were at once simplistic and alarming made them all the more persuasive, especially in the molding of public opinion to support preservationist land use policies. Yet this also generated the counter-argument that the resource scarcity predictions were smokescreens for other farmland preservation agendas.

With issues such as population, if conditions did not worsen at a certain point, the movement could always argue that society was spared this time but trouble was still on the horizon if ways were not changed. Another possibility was to find new justifications for the same cause. This is what happened with farmland preservation.

Bunce has argued that the three main non-production justifications to preserve farmland were: ecology, “local amenity protection,” and agrarianism. In addition to the productionist claims, Ames relied on all three of the other justifications. The ecological position found its roots largely in the “land ethic” first espoused by conservationist Aldo Leopold, who advised people to, “quit thinking about decent land-use as solely an economic problem. Examine each question in terms of what is ethically and esthetically right, as well as what is economically expedient. A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it

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18 Ibid.
19 Ibid., 237.
tends otherwise.” While many environmentalists, including Leopold, had problems with modern agricultural practices, turning farmland into a landfill for garbage would have been even worse for a “biotic community.” Leopold said that, “the less violent the man-made changes, the greater the probability of successful readjustment in the pyramid.” The pyramid was a kind of food-chain pyramid with soil on the bottom and on each layer above rested species that relied on the layer below it for food. This ecological position was the same one that such groups as the Sierra Club used to endorse resource recovery plants. Cecilia Burnett, a founding member of the Ames Sierra Club and an employee of the Story County Conservation Board, remembered telling the school children with whom she talked in the 1970s that there were the problems associated with both resource recovery and landfills, but ultimately she would come down on the side of resource recovery, because it saved land.

If local resources can be considered a kind of amenity, then Ames’s second type of justification for farmland preservation becomes clear. After a 1974 National Energy Task Force meeting in Washington, D.C., Juanita Vetter, Chair of the Iowa League of Women Voter’s Board of Environmental Quality, reported that,

Iowa and Missouri were reproached for our reluctance to mine coal, in spite of its high sulfur content and its small pocket type deposits. We explained our concern for the good agricultural earth so vital to the food supply. The plains-mountains representative chorused “we’re being raped so the rest of you can have energy. We’re going to look like the moon surface with nothing usable left!”


Leopold, A Sand County Almanac, 257, 252.

Author Telephone Interview with Cecilia Burnett, 30 June 2009.

Iowa did not have oil or good coal. The best thing that Iowa could offer a country worried about the future of its resources was farmland. Saving the land gave the state the ability to maximize its contribution to the nation.

Farmers in the late 1970s, trying to emphasize the importance of the U.S.’s, and their own, global contributions, adopted the slogan, “a bushel of wheat for a barrel of oil.”\textsuperscript{24} While agriculture did account for 1/5 of U.S. exports and offset 62\% of the trade deficit caused by oil imports, it could not compete toe to toe with oil.\textsuperscript{25} Plenty of other countries could supply OPEC nations with food, but there were not plenty of other countries to supply oil to the United States. And the U.S. was willing to pay almost anything for oil, as Assistant Secretary of Agriculture Dale Hathaway noted in 1979, but “no one is willing to pay $20 for a bushel of corn.”\textsuperscript{26} Agriculture’s dependence on oil, which had proliferated by the end of the decade, further weakened the argument that food should have parity with energy. By 1980, it took 1.13 barrels of oil to grow a ton of grain.\textsuperscript{27} Some economists and businesses argued that decisions between farm and energy interests should be based solely on which was more profitable. In a five-part series called “Vanishing Acres,” written for the \textit{Des Moines Register} in July 1979, reporter George Anthan quoted a USDA economist, who opposed that idea: “According to that kind of reasoning,” he said, “we should be taking land out of food production so we can save oil and natural gas. Then we could all sit down and eat oil and natural gas.”\textsuperscript{28}

\begin{footnotesize}
24 “$20 a Bushel, $20 a Barrell” July 1, 1979 \textit{Des Moines Register}, Sunday 5A.
25 Lehman, \textit{Public Values}, 60, 150.
28 George Anthan, “Those who don’t want to sell ‘can’t resist,”’ 12 July 1979, \textit{Des Moines Register}, 4A.
\end{footnotesize}
This kind of thinking is a mix between the amenity idea and agrarianism. In some cases, the reality might have been that converting land to energy uses would have been a better economic choice. Additionally, farmers might have been choosing to sell their land to developers. But in agricultural states such as Iowa, the idea that farmland was valuable was a natural one, whether or not economic analyses or behavior supported that thinking. It was an acceptable idea to many other Americans as well. Despite the fact that there was no food production shortage in sight, a 1980 Louis Harris public opinion poll showed that over half of all Americans surveyed considered the loss of quality farmland to be a “serious problem.”

Ames would use the inherently valuable status of farmland in the minds of its citizens as a justification for its resource recovery plant over the next three decades.

**Energy: The Other Crisis**

Of course the main conservation interest of President Jimmy Carter, the one that required the “moral equivalent of war,” was energy. Throughout the plant’s existence, Ames would use the land conservation justification for the plant much more often than the energy conservation argument, but the decade’s more famous crisis also played a role in the plant’s history. The energy crisis began just as construction of the plant started in 1973. Just as with their fellow Americans, many Ames residents didn’t believe there was a “crisis.” A substantial portion of Ames’ energy came from coal, while the national problem was linked to the oil embargo. But as other cities and states also started switching to coal, the fact that Iowa imported about 98 percent of its energy from other

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states became more of an issue. The price of coal went up 50% from 1974 to 1976.\textsuperscript{30} Promoters used the energy crisis as further proof that a resource recovery plant ought to be built. During its early years, researchers hoped that Ames would be an example for the state of the potential to use waste for fuel, and many believed that the state might become completely energy self-sufficient by turning its agricultural wastes into energy.\textsuperscript{31}

One such person was State Senator and poultry farmer Hilarius Heying. When Heying received notice that his Dyersville gas supply was in jeopardy in 1974, he teamed up with a Des Moines company called Sunny Time Energy to turn the manure from his 160,000 chickens into a continuous supply of energy on his property. The $75,000 system was called the POOP 4 and received $50,000 from the state energy department council. Iowa State professors offered to work with Heying and developed a five year plan of study on the conversion of methane to energy. As most alternative energy efforts of the 1970s, mechanical difficulties caused the plant to fail, and it lost its government funding.\textsuperscript{32}

Heying unsuccessfully continued to push the state to invest in turning waste—of all sorts—into energy, asking his fellow state senators to,

\begin{quote}
Picture then in your mind that every community could be self-sustaining if all the hidden energy in our wastes were frugally recycled. I have made a couple of years study of this----I have spent some fifty thousand dollars for worthless equipment, but I have learned a great deal. Now that we are running out of landfills and now that the sewage
\end{quote}

\textsuperscript{31} “Growing Energy,” 1
\textsuperscript{32} Larry Murphy, “Methane Making Electricity at West Union,” \textit{Des Moines Register}, Iowa State University Special Collections, Hilarius Heying; Letter from R.J. Smith, Assistant Professor, Iowa State University, to Senators T. Riley and H.L. Heying, 19 April 1974, 1 (Iowa State University Special Collections, Hilarius Heying); George Anthan, “The Ingenious Iowan: Beer Cans, Chicken Droppings Provide Energy, \textit{Des Moines Register} 12 May 1980, describes some of the solar, wind and battery-powered energy saving efforts of the decade.
is creeping up from the ocean bed onto our eastern and western seashores, we must be motivated to action.\textsuperscript{33}

Most state and local governments, however, could not afford to finance many, if any, experimental self-sustaining energy projects. This had been why the federal government began funding the resource recovery demonstration programs in the first place. The goal was to let one city learn from and tinker with the technological mishaps that would inevitably arise with any plant scale-up, so that other communities could later invest in technology that was no longer experimental. As all of the demonstration plants failed by the end of the 1970s, the lesson most cities took away was not to invest in resource recovery. The city of Ames jumped on the bandwagon early, however, before some of the demonstration plants had even been funded, not to mention failed.

\textbf{The Growing Problem of Risks}

Innovativeness was something there just was not enough of in the 1970s, according to John Hanley. Hanley, the Chairman and President of Monsanto, was disappointed with the state of industrial experimentation and fairly disgusted with the government regulations that discouraged it. Speaking to an audience in Houston in September of 1978, Hanley asked the crowd if innovation had died ten years ago. His company, which for almost a decade had been trying to improve its environmental record and image with its Enviro-Chem subsidiary, had not experienced much success with that endeavor. The Baltimore pyrolysis plant had been a flop, and acrolonitrile, a chemical used to make the company’s Cycle-Safe bottles, had just been shown to cause cancer in rats exposed to “massive doses.” The bottles, which took ten years to develop, were the first plastic soda bottles in the world. They could be recycled and refilled and just the

\textsuperscript{33} Senator Hilarious Heying, speech for state senate about Senate File #1126, Iowa State University Special Collections, Hilarious Heying.
lightness of the material promised to reduce the tonnage of bottle waste from 5.9 tons to 2.5 tons a year. Other companies were spending less on research, and foreign products were receiving twice as many U.S. patents as they had in 1968, while the patents for U.S. products abroad had declined.34 “Obviously innovation did not drop dead precisely 10 years ago today,” Hanley said.

Yet a strong case can be made that, during that 10 years, U.S. innovation has lagged far behind historical levels. And this lag has been a major contributor to our present economic ills, which we cannot hope to alleviate unless we boost our innovation rate. That’s why I believe that our nation’s most serious shortage today involves not energy or raw materials or jobs, but innovation.35

The industry man warned that people could not continue to ignore the impact regulation was having on businesses. Quoting Secretary of the Treasury Michael Blumenthal, he said, “Our technological supremacy is not mandated by heaven.” Overregulation and an overly cautious-attitude that banned products “based on flimsy evidence” would continue to drain the life out of innovation unless something was done. “Ten years hence,” he said, “we don’t want to look back and say that this was the day innovation died.”36

While innovation did not die during the 1980s, its future did look grim at the end of the Seventies. The issue was not just overregulation by the government or lack of effort by industry; there was also the public’s growing skepticism. In just four months in the middle of 1979, Americans experienced the Three-Mile Island Crisis; the crash of Flight 191, the largest airplane crash in U.S. history to that point; and the falling of the U.S. space station Skylab. Some said these problems were the result of more

complicated technology, some said that increased press coverage raised the visibility of problems, making them seem worse, and others said that fear of governmental consequences made industry less likely to be forthright about issues early on and early cover-ups led to big problems down the line. However much each of those suggestions played a part in changing attitudes, there was definitely a fundamental shift taking place in the American psyche. "In an historical reversal, society has begun focusing on the costs of new technologies rather than only on benefits," wrote historian Joel Tarr in 1984. "Public attention is now occupied with the risks and hazards associated with technology rather than its potential for progress." William Rathje and Cullen Murphy wrote that the problem started in the late 1960s, when the United States began suffering from a "scrupulous conscience" about risk, whereby our "sensors of sin amplify the most unthinking of technical violations into drumbeats of damnation."

The advantages brought to us by the automobile, we now know, come at a cost of 46,000 lost lives every year, and many times that number of devastating injuries; the price we pay for the automobile in terms of pollution has, of course, been staggering. Had we known in advance that this might be the case, would production of this machine ever have been allowed to proceed? Should it have been? We have managed to make peace with countless other less devastating but still harm-doing manifestations of progress, accepting them because the good they accomplish is seen to outweigh by degrees of magnitude the problems they cause.

The most distressing environmental risk for Americans was cancer thought to be caused by pollution. Cancer went from being the eighth biggest killer in 1900 to being

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37 Peter Behr and James A. Rousmaniere Jr., “U.S. Technology on Trial in Wake of Mishaps,” Baltimore Sun, 3 June 1979 A1, A11.
39 Rathje and Murphy, Rubbish!, 244.
40 Ibid., 181-182.
the second, behind heart disease, by 1970. In 1976, experts estimated that annually 900,000 new cases of cancer would be diagnosed, and 360,000 people would die from some form of the disease. Scientists believed that between 60 and 90% of cancer cases were the result of environmental (including behavioral) rather than hereditary factors.41 Throughout the 1970s, the EPA would have to weigh various environmental risks against the technological benefits they could provide. The agency determined in 1974 that 200 million pounds of the human carcinogen vinyl chloride were being released into the environment annually in creating America’s five billion pounds of polyvinyl chloride (PVC) plastics. Wrapped up in PVC production, however, were 2.2 million jobs and $90 billion. The EPA, then, had to decide “what number of human cancer cases constitutes an ‘acceptable risk’—a potential toll presumably balanced by a carcinogen’s economic benefits to society.”42 The standard measure for regulating pollution risks was how many extra deaths there would be over an exposure period of 70 years "at the point of maximum concentration in excess of what would be predicted without the exposure."43 Scientists could determine whether or not a substance was toxic, but there was no defining way to determine what, if any, were the acceptable levels of exposure. As Gus Speth, of the Council for Environmental Quality, told the League of Women Voters of Texas at its conference on environmental cancer, “There are competent scientists on both sides of the issue of whether a no-effect threshold exists for carcinogens. Some believe that even an infinitesimal dose of a carcinogen entails some risk.” Indeed, there was “no

43 Bloomberg and Gottlieb, War on Waste, 102.
scientific basis for setting a safe threshold dose for a carcinogen, nor do we have scientific proof that a threshold level exists.” Consequently, any policies would result in the banning of a hazardous product or technology instead of just limiting its use.44

The EPA, then, measured cancer deaths in a population instead of cancer thresholds in individuals. For the agency the limit for acceptable cancer rates was "one excess cancer in a population of one million."45 EPA’s acceptable risk levels were not the same as the public’s, however. In his article on the “Perception of Risk,” psychologist Paul Slovic said that, “Whereas technologically sophisticated analysts employ risk assessment to evaluate hazards, the majority of citizens rely on intuitive risk judgments, typically called ‘risk perceptions.’ For these people, experience with hazards tends to come from the news media, which rather thoroughly document mishaps and threats occurring throughout the world.” People in industrialized nations generally felt there were more risks in their world than their ancestors’ world, even though the opinion of professional assessors “contrasts sharply” with that notion.46

To demonstrate the importance of perception, Slovik pointed out that even though Three Mile Island had no deaths and “few if any latent cancer fatalities (were) expected,” it was the most expensive accident in the country’s history because of the local impact as well as the changes it required in the nuclear industry. There are many ways that experts have tried to evaluate how people perceive risks. Some of the most influential factors include “voluntariness of exposure, …familiarity, control, catastrophic

potential, equity, and level of knowledge." Rathje acknowledged that with waste management disposal there was a difference between voluntary and involuntary risks but still pointed out that, “Certainly something must be done to accommodate what recycling and source reduction can’t cope with.” As Lanier Hickman once told David Sussman, “The absolute worst thing you can do with garbage is not pick it up.” Any waste removal system was healthier than no waste removal system. Furthermore, landfill leachate and mass burn emissions might contain dangers, but they were definitely improvements health-wise over the open dump burning that had been prevalent across the country before the 1970s. Yet resistance to high-tech disposal systems on the objection that they were too hazardous became a serious obstacle by the 1980s.

Resource recovery and WTE proponents often did not respond with understanding or diplomacy to the fears of those who perceived risk in high-tech waste disposal facilities. In a paper presented at the Solid Waste Association of North America meeting, Dr. Walter Shaub, technical director for the Coalition on Resource Recovery and the Environment, stated that "risk assessments invariably show that the potential risks associated with incinerator air pollution emissions are very small compared to the risks of everyday activities such as smoking, drinking, exposure to sunlight, driving a car, or the burden of naturally occurring [sic] toxic compounds that are found in food." Shaub included a quotation from a Harvard University professor who stated, "If some politician says that you are insulting his intelligence by comparing the hazard of an incinerator to

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47 Ibid., 283, 284
48 Rathje, Rubbish!, 182
49 David Sussman Interview with Author.
one cigarette a year per person, answer back without fear, that you are sorry that the people elected someone who is insulted by the truth.” Possibly because of this kind of response—the kind Barry Commoner and Rachel Carson had fought against in other areas that gave hegemony to scientific arguments over those of regular citizens—environmentalists, many of whom had not opposed resource recovery in its first decade, increasingly came to object to technological trash solutions. Journalist Harold Crooks said that activists started to see the “hard path” as "too costly, too centralized and of a scale incompatible with democratic control." In his speech to the LWV, Speth said democracy and competing values made decisions about risks and carcinogens so difficult. There were 70,000 existing chemical substances the EPA had jurisdiction over and four million more were in the research and development phase. Even if everyone agreed on which substances were hazardous and what their hazards were, there was still be plenty of disagreement on what risks were worth taking for which benefits. As with the car example, for instance, most people have driven or ridden in a vehicle despite the comparatively high level of risk associated with that practice, so it seems fair to assume that most people would choose to live with some amount of carcinogens, if the trade-offs were deemed beneficial enough. Speth said,

At this point we might wish for the modern equivalent of Plato’s Philosopher-King—one person whose superior wisdom and preeminent virtue made his authority acceptable to all. Such Fellows may have abounded in ancient Greece, but they seem to be rare today—and we cannot defer our choices until one of them arrives.

51 Ibid., 100.
Recognizing that we are faced with uncertainty, we must decide for ourselves—and we must decide soon. … It is both the glory and the burden of democracy that lay citizens must make the final choice.\(^5^4\)

Throughout the 1980s, Americans would increasingly lean toward environmentalism that incorporated democratic ideals and occurred on a localized, or individual, level.

**The Ames Plant**

Because of its size, the high-tech Ames solution at least appeared to be on a scale compatible with democratic control. Upon the recommendation of the consulting firm, the city proceeded with the resource recovery RDF plant and put out calls for bids for the plant’s numerous parts in 1973. The initial expected cost was $2.8 million, which would primarily be funded through general obligation bonds that did not require a vote from citizens. The plant appears to have had plenty of local support, however. Mayor Stuart Smith considered the plant to be one of his highest priorities, and City Manager J.R. Castner said that, “In nearly 25 years in local government I’ve never been involved with a project that everyone in town thinks is the greatest thing that has come down the tube since the toothbrush…. People stop me on the street and at cocktail parties to ask how the plant is coming along and when they can go through it.”\(^5^5\) The Ames League of Women Voters undertook a major study, which culminated in strong support for the plant. Iowa State University and the Story County communities that had been using the Ames landfill all agreed to 25-year contracts to utilize the Ames plant for all of their solid waste disposal needs. Both mayoral and several of the city council candidates in 1973

\(^{5^4}\) Speth, “Waiting for a Philosopher King.” 15-16.  

Inflation and unexpected costs caused the plant’s start up price to soar. By 1974 the expected cost had doubled to $5.6 million, and the final total was $6.3 million. While the Ames plant had some national notoriety—EPA administrator Russell Train came to the city to dedicate the facility—it failed to receive any demonstration grant money. The EPA provided multi-million dollar funding to its demonstration plants that would soon fail, but the agency only gave Ames a $600,000 grant to buy degritting, dust collection and sprinkler systems. EPA also provided a $750,000 grant to the city, which distributed it to Iowa State University and the Ames Laboratory to study the “Ames Experience,” including environmental, economic and political aspects, for three years.\footnote{“Gibbs, Hill, Durham and Richardson Memorandum of Understanding dated May 10, 1977” \textit{Ames City Council Meeting Minutes} 11 November 1977, 588; \textit{Engineering News Record}, 5 September 1974, 13; S. Keith Adams, “The Economics of Solid Waste Resource Recovery—Analysis of the Ames System,” Proceedings of the Solid Waste to Energy Conference,” 73.}

Demonstration plants had to demonstrate a new technology, and as Ames was modeled after the St. Louis RDF plant, it did not qualify. The \textit{Ames Daily Tribune} editorial board felt short-changed in the publicity department. El Cajon, California was working on a
pyrolysis plant for which it had received demonstration plant money. The disposal
technique was quite different, but the size of the plant and the community it would serve
were both very similar to the Ames plant.\textsuperscript{59} “It may be that El Cajon has a better
publicity system than Ames,” the board wrote in an editorial entitled “No Glamour.”
“But so far little has been made of the efforts here. But it remains that on paper, the
Ames operation is more impressive than the more-publicized California plan.”\textsuperscript{60}

At the Ames plant, haulers entered a 30-foot high room and dumped their trash on
a tipping floor. A worker in a machine called a loader mixed the material, combining wet
and dry trash in a mix that would encourage its combustion. The mixed waste was then
put on a conveyor belt called the feeder where it entered the primary shredder. At this
stage the garbage was ripped to shreds by 48 130-pound hammers with a 1000
horsepower motor. It then passed through the degritter, where small pieces of waste were
captured by disc screens and the larger pieces continued on through the process. The
degritted material was typically non-combustible and ended up in the landfill. The large
items were conveyed through an electromagnet where 90 percent of the ferrous metals
were removed. The remaining waste then passed through a secondary shredder where it
was shredded into two-inch pieces.\textsuperscript{61}

At this point the material entered the air classification system, similar to St.
Louis’s cyclone. As the waste was fed into the air classifier, the heavy materials fell to
the bottom, while the lighter waste floated up in the air, where it was sucked into a

\textsuperscript{59} “Energy Meeting Grosses Varied Ideas,” \textit{Ames Daily Tribune} 30 January 1974, 1; John D.
Parkhurst, \textit{Report on Status of Technology in the Recovery of Resources from Solid Wastes} (L.A.: County
Sanitation Districts of Los Angeles County, California, 1976), 123; Proceedings of the Solid Waste to
\textsuperscript{60} “No Glamour,” (Editorial View), \textit{Ames Daily Tribune}, 8 January 1974.
\textsuperscript{61} “Energy from a Wasted Resource: The Ames Experience,” (Ames, Iowa: City of Ames,
1989).
pneumatic tube and carried to the RDF storage bin.62 Pneumatic conveyors sent the material into one of two coal boilers, where it would be co-fired with coal at a ratio of about 70-80% coal/30-20% RDF. The plant could process up to 200 tons of waste per day. Its relatively small size was an asset to the RDF technique, because larger utilities usually fired 100% coal during their peak hours and switched to 30-40% at night, buying the rest of their power from a pool. When co-firing with RDF, the off-time slackening could not occur, so the system was more expensive for large companies to adopt. Consequently, Ames became “the first and the big major contributor to this technology.”63

The plant brought in money by selling the materials for which there were markets and by the reimbursement it received from the power plant as a source of energy. Therefore, the economic situation of the plant depended a great deal on the markets for the various metals and the price of energy. In its first three months of operation, Ames shipped 542 tons of ferrous metals, bringing in over $44,000. The plant sold one-hundred and twenty tons of wood chips for $15 a ton. For a brief time it also had a motor-oil container that could hold up to 10,000 gallons of used oil, which were expected to sell for ten cents a gallon. Exemplifying the flexibility that was touted during the Congressional resource recovery hearings in 1976, when some Ames citizens complained that paper was just being wasted in the recovery process, the city built a paper recycling annex next to the plant and burned it or sold it for up to $40 a ton depending on the economic markets.64 The plaque on the door read, “Dedicated to the Reuse of our

62 Ibid.
63 Author interview with Al Joensen, Ames, Iowa, 28 July 2009.
64 Summary 76, 3; Tom Gorton, Planning January 1977.
Resources and the Protection of our Environment,” reflecting both the resource conservation and land preservation mentalities that plant proponents were embracing.\footnote{Interview with Al Joensen.}

Although the city considered the plant to be an engineering success, it had mechanical hiccups as all new resource recovery plants had. As in all of the other new plants, there were explosions, clogs and jams. City manager Terry Sprengel estimated that the plant was shut down ten to fifteen days a year due to various problems. While that may not seem like much, the lost days and poor markets of the late 1970s were financially disastrous. The state’s Department of Environmental Quality (DEQ), which had been anxiously observing the situation, quickly lost its enthusiasm for resource recovery projects. When state legislators, led by Senator James Gallagher of the 16th district in the northeast corner of the state, considered using part of a litter tax to fund resource recovery projects in 1977, Peter Hamlin, the director of land quality for the DEQ, responded that,

\begin{quote}
Resource recovery is an idea whose time has not come.… The rosy predictions emanating from Ames about its facility have turned sour once they actually began operation.… In the next 8-10 years, resource recovery projects may become more feasible in Iowa. Until such time, subsidizing resource recovery projects to make them economically compatible with sanitary landfills would be a major drain on the state’s general fund.\footnote{Peter R. Hamlin letter to Dennis Nagel, “Litter Tax,” 1 March 1977, State of Iowa Historical Society Des Moines Archives; “Resource Recovery,” 28 February, 1977, State of Iowa Historical Society Des Moines Archives.}
\end{quote}

In the federal government, however, there was faith in the process, now even in the executive branch. The Carter administration thought resource recovery or waste to energy (WTE)—the terms were used interchangeably for awhile at the end of the decade, although, the government was moving towards WTE-focused facilities—was an idea
whose time had come. Backing and implementation, however, are not the same, and while resource recovery received a lot of backing from the Democratic president, as it became primarily an energy recovery process, the nearly universal ideological support it had received began to crumble. Carter’s big plans came too late in his administration and the multi-billion dollar support he wanted to give a new generation of facilities never saw the light of day.

**Carter Calls for Energy**

To Jimmy Carter, smaller scale energy projects were a solution to some of the growing environmental fears of the country. Carter’s campaign study group on energy and the environment concluded that smaller energy facilities should be placed closer to the people using the energy, so pollution would stay closer to those producing it and to possibly “enhance the awareness of the environmental, social and economic cost of an energy-intensive society.” The new president expressly tried to make his new national energy plan (NEP) be on a scale of democratic control. On March 2, 1977, Assistant to the President James Schlesinger published a letter in the Federal Register, asking Americans to send in their thoughts on the energy situation. In addition to the publication, 600,000 letters were mailed to Americans across the country. About a month later the White House had received “27,898 letters, telegrams, packages, mailgrams, and position papers.” Of the total, 18,721 were from regular citizens. The result was what the Administration called a “Town Hall by Mail.” Opinions of the effort varied. Lawrence R. Moore of Odessa, Florida, said, “I have been a citizen of this country for

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67 Energy and Environmental Protection Study Group, 3 Jimmy Carter Library, “Jimmy Carter Papers-Pre-President” 1976 Pres. Campaign Box 118 Enviro. [1].
over five proud years. Yet I must admit that receiving your request for my
recommendations has been the highlight of my citizenship.” 69  Paul Nissman of New
York, on the other hand, thanked the administration and then wrote, “I have damn little
faith it will make any difference considering the power of the oil lobbys [sic] and others
like them … Just the same I did not want to be accused of not caring.” 70  And Evelyn
Richard, of Barrington, Illinois, whose printed address label had a smiley face on it,
wrote back, “Dear Sirs, One way we could conserve energy is to stop publications such
as you recently sent me! What a total waste of the taxpayers money, paper, & postage.
… If this is part of the national energy plan to put out booklets such as that—we’ll be in
dire trouble in less than 25 years!” 71  Respondents noted what issues most concerned
them: Supply development (62% mentioned) and conservation (61%) were the most
frequently discussed subjects, followed by federal regulation (36%), environment (27%),
imported energy (25%), intergovernmental relations (13%), citizen participation (9%)
and hardships (6%). 72  Under the energy supply development category, coal was
mentioned the most frequently, solar came in second, then nuclear, followed by wind,
and finally, “the conversion of solid or biological waste into power,” which over 100
writers suggested.

One of those was St. Louis resident Thomas Dolan who submitted a 12-page
outlined energy plan to the president. He called the abandonment of the Union Electric
plant “very disappointing” but did not mention the NIMBYism that helped contribute to

69  Shelly Weinstein Memorandum for Bill Morrill and Jim Bishop, “Quotes and statements
excerpted from written responses for possible use in the President’s fireside chat.” 14 April 1977, 2 Jimmy
70  Ibid., 3
71  Evelyn R. Richer to “Dear Sirs,” Jimmy Carter Library, James Schlesinger Box 10,
Correspondence Support 3-7/77.
72  Ibid. 18.
the project’s demise. Besides some tax incentives, his suggestion was not that far off from what the EPA and DOE would soon decide: “There are reports that some foreign communities are very advanced in the area. We should gather all world wide information available and make it available to our people.” He also echoed the desire of Harkin and Heying in suggesting that the government “gather (the) best information available on getting energy out of farm waste and make (it) available to farmers in useful detail.” His last suggestion showed the serious approach which some took the issue of conservation. He stated that, “The Secretary of Energy should be authorized to ban any practice, habit, advertisement or inducement deemed to encourage or to result in wasteful or excessive use of energy.” Another familiar plant was mentioned by William Donald Schaefer, Baltimore’s colorful mayor, who wrote Carter about his city’s experiment (without explicitly mentioning its abandonment a few months earlier). Schaefer said that “The gravity of the (energy) situation was made painfully clear last winter when a large number of business and industrial firms in Baltimore were forced to suspend operations because of energy cutbacks. Ironically, at the same time the City of Baltimore was burning 600 tons of mixed refuse per day without being able to recapture this energy.”

Others focused on innovations rather than policy. Millen Gerber of Toledo, Ohio, wrote his Congressman about the discovery of what he called “burning air,” which seemed to use a technique similar to the Baltimore pyrolysis plant. He started a fire in 5-gallon paint bucket and cut a hole in the lid where he could put his “Gerber forced air

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73 Ibid., 25.
75 Letter from William Donald Schaefer to The Honorable James Earl Carter 20 May 1977, Jimmy Carter Library.
pressure furnace,” and burn the paper and the smoke at the same time to eliminate pollution from smoke. “It has been so cold out here. Please help,” he wrote. “The longer you wait to act the longer more people will be cold next winter. The next time you come to Toledo, why don’t you come to see me and I will show you how my smoke burner works.”

Taking the president’s town hall method to heart, many aimed higher than their own representatives. Mrs. R.D. Abbott and her husband Richard demonstrated the earnestness of some citizens and the familiar way many people approached the President even before his call for energy solutions. Their company, Recycling Industries Co. in Arizona, had a plan to use cellulose and waste paper to save energy. In a mailgram to the president, Mr. Abbott asked Carter to “come to Phoenix and see what can be done on a nationwide basis. But while in Phoenix I would be greatly honored if you would consent to stay in my home so that we might have an opportunity to have a more leisurely poolside chat about this program of national significance.”

When they received no response in five days, the couple called the White House and tried, unsuccessfully, to reach Secretary of Energy James Schlesinger. After that failed attempt, Mrs. Abbott wrote presidential adviser Margaret “Midge” Costanza, that “somehow we have to have an audience with President Carter to explain further. If Mr. Carter is indisposed perhaps then Mr. Ford, Mr. Slessinger [sic], Mr. Mondale or Mr. (William) Rosenberg [sic] would be the President’s emissary.”

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76 Millen V. Gerber to Congressman Ashley, 1-3 [Thomas Ludlow Ashley], 2 March 1977 Jimmy Carter Library, James Schlesinger, Box 10, Conservation Suggestions 3-7/77.
77 Richard Abbott Western Union Mailgram to PMS President Jimmy Carter 16 February 1977, 1, 2 Jimmy Carter Library, James Schlesinger Box 18, Recycling [Resource Recovery].
78 Mrs. R.D. Abbott to Margaret Costanza, 1 Jimmy Carter Library, James Schlesinger Box 18, Recycling [Resource Recovery].
And one woman thought marketing was the biggest problem and had her own, fairly regionally-biased solution. Louise Ely, a snowbird who had permanently moved south, was disappointed that the FEA had the mascot Energy Ant (still the government’s mascot today). As she said, “ants only work for themselves, (and) a BLUE ant galvanizes no one to do anything, I firmly believe.” She proposed that instead a “lazy, unlovable WAY STING ENERGY would be worth whatever effort (and coin) the switch occasioned.” Way Sting was an incarnation of some species of stinging insect that appeared to have the head of a puppy and a rather derogatory stereotypical Southern accent, saying things like, “Jes’ leave that TV on when you’re goin’ someplace; Don’t worry ‘bout turnin’ it off.” Or, “Go 60 miles an hour! Jes’ 5 more than Poky 55; We got gas!”

The thousands of responses showed that Americans, for the most part, were interested in joining what Carter would soon call the “moral equivalent of war.” Many responses urged conservation or policy changes. Still, the inventive, creative and often hopeful solutions, as far-fetched or impractical as some of them might have been, belied the death of innovation that Monsanto president Hanley lamented in 1978 and did not foreshadow the “crisis of confidence” that Carter would speak of just two years later. Americans in 1977 were optimistic that energy worries could be solved through some means. That means did not necessarily have to be in opposition to environmental goals. A study conducted by the organization Resources for the Future found that among Americans support for environmental protection leveled off during the first energy crisis but “remained strong” throughout the decade and was starting to rise again by 1978.

Independents showed a higher interest in spending more on the environment (66%) than Republicans (52%) or Democrats (55%), but most people were pro-environmental protection when such a goal could be reconciled with energy or economic plans.\textsuperscript{80} As president, Carter worked to balance all three issues and presented his NEP to Congress in April 1977, but Congress would not pass it for quite some time.

**Congress and the Other Feds**

In 1979, the General Accounting Office conducted a Comptroller's Report of the role of the federal agencies involved with resource recovery. It concluded that despite the efforts of the decade, neither the EPA nor DOE had done a good job of disseminating information, helping communities assess the possibility of WTE plants, providing incentives to try WTE projects, helping communities develop markets, or testing equipment, so as to be able to provide answers to interested entities.\textsuperscript{81} Although the Comptroller's Report recommended that the DOE should take the lead in WTE programs, the Memorandum of Understanding the agencies submitted to Congress established the EPA as the lead agency in working with communities in project planning and development, and DOE as the lead agency for demonstrations of new technologies and for financial assistance in facility construction. In this pursuit, DOE will develop a list of candidate technologies for demonstration. Appropriate communities being assisted by EPA will be identified and selected for hosting those demonstrations.\textsuperscript{82}

\textsuperscript{80} Kathryn Utrup (Resources for the Future), “Environmental Public Opinion: Trends and Tradeoffs, 1969-1978” 2, 3 Jimmy Carter Library, Staff Office, CEA Box 24 [EPA 2].


At the 1979 Waste to Energy Hearings, which started two days after Carter’s “Crisis of Confidence Speech,” Steffen Plehn, the EPA’s Deputy Assistant Administrator for Solid Waste, made a distinction between resource recovery and waste to energy, without referring to the terms:

Let me say at the outset that energy recovery from waste can take two forms. First, energy can be recovered for the direct combination of waste, alone or in combination with another fuel such as coal. A ton of waste in the United States contains about 4500 BTU per pound, about half that of coal. Second, the recovery of materials such as ferrous metals, aluminum, paper, and glass is also a form of energy recovery. For example, a ton of aluminum from virgin ore requires the equivalent of over 30 barrels of oil to process. A ton of recovered aluminum requires about 1 barrel.  

With that introduction, Plehn defined the difference between resource recovery, a solidly conservationist, and therefore one type of environmentalist, solid waste solution, and waste-to-energy, which at base might be no more than a new energy supply. At the 1976 hearings, resource recovery was a fluid term that at times separated sources and at times burned waste for energy. The determination of burning or sorting was based on economics or resource needs. Now, instead of one fluid approach that oscillated between tensions, accommodating different views and needs, allowing cooperation, there were two distinct, competing agendas. While resource recovery at least had some slowdown of consumption because of the reuse of recycled materials, WTE mandated no such pause. Plehn said that, “Fortunately, there is no inherent conflict between source separation and waste recovery and the production of energy directly from waste.” While that had been the case with the broad definition of resource recovery, the shift to the new term, the new

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83 Plehn, 29
84 Ibid., 30
focus, and the new type of machines, would lead to suspicion and conflict between the source separators and the burners.

Reigning in Packaging

Even though support for protecting the environment had become “strong among all segments of the public,” by the end of the 1970s, that did not necessarily translate into an abandonment of materialism or consumption. Environmentalists and some scholars, who the president read enthusiastically, talked about the problems of materialism and consumerism but Americans were not showing any sign of curbing their appetite. Harvard sociologist and author of *The Cultural Contradictions of Capitalism*, Daniel Bell, was one of the scholars that Carter admired. Bell said that throughout history economic interests would try to drive change, and culture would be the anchor that prevented society from changing too much. In modern America, however, economics was the anchor, as it could be reigned in by “various veto groups,” for instance through NIMBYism, and by government regulations. American culture, on the other hand, had no restraints. Its “individualism” and pursuit of “self-fulfillment” had become the ultimate goals, and as Bell said, “Modern culture is defined by this extraordinary freedom to ransack the world storehouse and to engorge any and every style it comes upon.” At their jobs Americans still showed “devotion to the enterprise,” allowing the production side of the economy to continue. “Yet on the marketing side,” Bell argued, “the sale of goods, packaged in the glossy images of glamour and sex, promotes a hedonistic way of life whose promise is the voluptuous gratification of the lineaments of desire. The

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85 Utrup, “Environmental Public Opinion,” 2.
consequence of this contradiction … is that a corporation finds people being straight by
day and swingers by night."  Although Bell focused on culture and economics and only
fleetingly mentioned the environment, we have seen in the examples of Barry
Commoner, Rachel Carson and the Sierra Club that unfettered productionism and
consumerism were also key concerns of environmentalists. Some, like Commoner,
argued that the capitalist economic system itself could not co-exist with a healthy
environment. Carson did not discuss economic means but demanded an end to the
barrage of untested chemicals and a rethinking of the consumer and industry goal of
trying to control the environment. The Sierra Club, a rather conservative branch of
environmentalism, pushed for personal limits of consumption in the 1970s, not seeking to
change the economic structure or inhibit most types of technology.

Despite these varied calls for the country to rethink its seemingly insatiable
appetite for the material, Americans continued to consume, just as they had after growing
fearful of the copious amounts of litter and giant heaps of trash that had first gotten the
government involved solid waste in the mid-1960s. Unable to convince mainstream
America that consumerism was bad, in the early 1970s, environmentalists sought to
convince politicians and the public that the packages their products came in were bad and
that businesses needed to change this element of their practice. These environmentalists
said that taxation could regulate excessive packaging, extending the life of products,
recycling, and making other reclamation efforts related to source separation more
popular. If the U.S. were to revert from the amount of packaging it used in 1977 back
to the amount it was using twenty years early, one environmental activist estimated it

87 Ibid., xxv.
88 Baum and Parker, Solid Waste Disposal, 184.
would save 753 trillion BTUs of energy annually, “enough to drive 23 million automobiles (one-quarter of the total registered in the nation)—from New York to San Francisco.” An EPA official said that taxing the packaging would save “7.7 million tons of materials and 1 trillion kilowatt hours per year.” Early in the decade many politicians supported mandates that would make companies tighten their packaging policies. The United States Public Health Service first started investigating packaging in the 1960s, and the EPA supported the notion of a national bottle bill, as a “significant contribution” that would “most significantly reduce the size of our nation’s trash piles.”

The Office of Solid Waste Management Programs had been less enthusiastic about packaging laws in general, arguing that such measures would create more bureaucracy, while only achieving nickel and dime results. As Arsen Darnay said,

If our objective is to conserve natural resources, perhaps the way to go about it is not to look at the refrigerators and packaging but at the larger parameters of our consumption. For instance, considerably more material flows through housing and construction activities than packaging activities. Considerably more energy can be conserved by mandating, for instance, construction codes that increase the insulation in houses and make better use of sunlight for heating and lighting, or measures which limit the square footage of living space that a house, apartment, or office may have per capita.... We could limit demolition of old buildings that are perfectly serviceable but are being torn down to be replaced by buildings that are, at least in my opinion, often much less comfortable. These are some of the types of activities ... that we could undertake that would have much, much greater impact than, for instance, regulating whether or not we should have paper towels.

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90 Ibid.
Darnay’s argument was likely based on the fact that municipal solid waste accounted for a very small amount, about five percent, of the country’s total waste. Agriculture and construction and demolition (C&D) represented the largest sources of waste, followed by mining. MSW was a more immediate problem because it, along with C&D, were the ones closest to people and it had the most mixed waste stream, making it the hardest to dispose.93

Even though no packaging laws were passed, the EPA began advocating "reuse, longer life, improved durability, and less use of materials and energy" by the mid-1970s.94 Some politicians and environmentalists, however, could not see what was wrong with taxing excess packaging in order—they hoped—to reduce the amount of waste going to landfills. They argued that if businesses and their packages were filling up landfills, they ought to be helping to pay for new disposal methods. Additionally, they argued that if consumers were taxed for items like grocery bags, they would be more likely to try to extend the life of the taxed product instead of discarding it for a new one. Businesses fired back, however, and said that if they were charged extra for packaging, the price would just be passed on to the consumer anyway. Setting up a bureaucracy to establish and collect the taxes would just be a waste, they said. A tax on packaging also punished the poor. Not only were taxes hardest on them, the poor were more likely to buy smaller, individual rather than larger, bulk items because that was what they could afford. If a per-item tax were applied, the underprivileged would have to pay more taxes for the same amount of goods because of the way they purchased them. Most importantly, they argued that viewing increased packaging as only a detriment missed a

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93 Need Source
good deal of the situation. In a speech delivered to the American Home Economics Association, American Can Company's Judd Alexander, reflecting the technological optimism typical of industry, said that, "If the fruits of automation offer a better life to more people, we are traveling in the right direction, and we must not let garbage stand in our way. We must find the technological solution to that problem,"\textsuperscript{95} He cited examples of Philadelphia Cream Cheese adding a carton to its foil package, which saved a net of 12 percent packaging because the shipping package could be less sturdy. He also mentioned the individually wrapped cheese slices, which had extended the life of cheese in the refrigerator. "When I was in college," Alexander said, "only the football captain could crush a beer can in his bare hand. Now any sissy can do it. That's because the metal in the average can has been reduced by 30 percent. New technology now being introduced will reduce that another 25 percent."\textsuperscript{96}

Lanier Hickman has blamed the failure to establish a national bottle bill on the business interests of PepsiCo. and others in the beverage and container businesses. Container manufacturers worried that they would be driven out of business by recycled products, while beverage makers feared that deposits would hurt sales and that consumers, already suffering the pangs of inflation, would switch to other flavored beverages that did not require the extra money at purchase time. American Can Company tried to develop its own resource recovery system called “Americology.” The plant opened in 1977 and ran at full capacity from April to September of 1980, processing 1,000 tons of waste per day in Milwaukee, Wisconsin. Americology used a complete source separation system, taking newspapers, corrugated cardboard, ferrous

\textsuperscript{95} Judd H. Alexander, "Packaging, Garbage, and the Quality of Life," \textit{Vital Speeches of the Day} 42, no. 22 (September 1, 1976), 687.

\textsuperscript{96} ibid.
metals, glass and aluminum out of the waste stream. The remaining waste was co-fired with a very poor quality of coal at the Wisconsin Electric Power Company. The residue, or slag, left from the RDF and the coal was so thick that it “had to be shot off the walls of the furnaces with elephant guns.” The slag often caused equipment failure or mishaps and eventually was blamed for breaking a generating turbine, a mistake which ended the Americology system, which, otherwise, Hickman said, “might still be operating and producing” RDF.

The other outcome of industry’s anti-bottle bill efforts was the formation of the National Center for Resource Recovery (NCRR) in the early 1970s. Even Hickman, a pro-resource recovery expert strongly disapproved of this organization, which Pepsi chief executive director Donald M. Kendall and other business leaders who all chipped in to fund as part of their anti-packaging-legislation lobby. If beverage and container companies could take care of the cans and bottles in the waste stream themselves then they could avoid coming under government regulation. According to Hickman,

> The formation of NCRR was clearly an arrogant action that was both cynical and driven by corporate greed. As is often the case, however, good things can come from evil actions. The good was contributions to improving solid waste management technologies.... The evil was a corporate coalition that diverted attention away from its unwillingness to recognize that its products created a lot of problems in solid waste management.

The existence of the NCRR and this quotation help to both explain and belie the popular notion that resource recovery proponents were the hand-maidens of industry. It does not quite have an environmental sensibility either. This quotation seems indicative of a

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98 Ibid., 217.
99 Ibid., 98.
mentality that is not pro-business or pro-environment but rather pro-efficiency and pro-planning. Resource recovery proponents wanted efficiency in process, just as they wanted efficiency in resource use. While there would become a clear divide between those who sought to use waste for energy and those interested in source separation, the divide between source separating resource recovery proponents and “soft-path” or low-tech recyclers was this emphasis by the former on planning and efficiency. As historian Samuel Hays has noted, “Planning has almost invariably involved the assertion that better action on a wide variety of fronts required larger systems of administration and control.” Furthermore, he stated, “The values in planning have been associated with the politics of overcoming the resistance of smaller-scale institutions to the drive for larger-scale organization and action.”

Hays explained that the desire to plan comes from people who see the “normal course of events” in the world as not turning out the way they would like, and so they plan in order to control the outcomes. The three major proponents of planning, according to Hays, were business, professionals and the government. Hickman and the NCRR represented professional and business interests, respectively. While both wanted to plan, to Hickman, the exclusively business “smaller-scale” interests of NCRR would have been an obstacle to planning policies and the most efficient use of resources for the larger-scale of the country as a whole. For Hickman, a national bottle bill might have been the most efficient approach to dealing with that particular type of solid waste, but “greedy” and “evil” business interests prevented that use because of their own agendas. As planners themselves, businesses from Union Electric to Monsanto to American Can Co.

101 Ibid., 31.
were on board with the idea of resource recovery and national solid waste disposal planning but basically because it helped meet their own immediate needs or, more cynically, because it allowed the continuation of industrialism and consumption, but not for Hickman’s end goal of more efficient solid waste disposal or the government’s goal of more efficient resource use. Hickman was somewhat naïve for even thinking that should be different.

One national law affecting resource recovery that Congress did pass from the 1978 National Energy Act was the Public Utility Regulatory Policy Act (PURPA). PURPA tried to remedy what alternative energy providers already knew: you need customers to be successful. Companies like Devco (that had courted St. Louis in Chapter 1), Wheelabrator, and Ogden built and sometimes operated resource recovery or WTE plants without necessarily having an arrangement in place the way the Baltimore pyrolysis plant did, for instance. If they were trying to sell a plant in a market, they would have to find a utility to buy the power the plant produced. Often times utilities paid resource recovery, and other forms of alternative energy, much less money than they paid for traditional forms like coal or oil. PURPA required utilities and companies to buy power from non-utility generators (NUGs) like resource recovery operations at the same price they would pay for power from the regular electric companies. Furthermore, utilities had to buy from a NUG before buying from regular companies if the energy was of equal quality. Although it looked like this meant guaranteed markets for waste conversion processes, when energy prices fell substantially during the six years after PURPA became law, the guarantee for parity with coal and oil did not mean much.¹⁰²

Ames

As a municipally-owned plant, Ames already had a guaranteed buyer in the local public utility. While its only guaranteed market was for its energy, the plant was always resource recovery-based rather than WTE. The city laid out five goals for the future Ames resource recovery plant: conserve resources, provide a low-sulfur fuel supplement, keep the private hauler system for the city, ensure a 20-year lifespan for the plant, and keep costs competitive with those of a landfill. The city even adopted a mascot called “Reggie the Recycler.” Reggie, a cat, said that “Solid waste has five lives”: fuel (84%), ferrous metals (7%), sand and glass for aggregate (3%) aluminum and other non-ferrous metals (1/2%) and paper, wood and oil to make up the rest. Despite the DEQ’s claim that operations were not as “rosy” as the city had hoped once it began operating, the city was pleased with its progress from the beginning. In May of 1976, Jerry Temple, the plant’s superintendent replied to a request for information from Representative Harkin, saying, “We feel we have a solution to a problem and hope more people will look into recovery and do it.”

Just as with the Union Electric plant, the promoters of the Ames plant used the issue of reduced pollution as a selling point. By the end of 1970s, air had become a commodity with some states allowing companies in large cities to buy and sell emissions rights with other companies. In 1980, heavily populated cities in the east that had lessened emissions over the previous decade to meet EPA laws began to blame the

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103 Ann Mattheis, *Waste Age* July 1984, 154; John Pohlman also confirmed that the plant was expected to have a 20-year lifespan. “(For) most of the equipment … I think there was a twenty-year life expectancy, meaning that most people don’t build a major piece of equipment without some expected life expectancy under normal maintenance and normal use.” John Pohlman, interview with author, Ames, Iowa, 6 May 2009.


Midwest for the continued existence of acid rain in their cities. Less populated Midwestern cities had fewer people to pollute and so rarely violated EPA limits, but eastern cities claimed the polluting they were doing was causing national problems. The most notorious threats to air in the 1970s were carbon monoxide, nitrogen oxide, both of which contributed to smog, and sulfur dioxide, which caused acid rain. In Iowa, state law required that Iowa coal be purchased when available, despite its high sulfur content. In 1974, Ames purchased 70% of its coal from a company in Des Moines providing a high sulfur product, while the remaining 30% was a low sulfur coal from Wyoming. RDF has less than 10% of the amount of sulfur as Iowa coal. Even though two tons of garbage had to be burned for every one ton of coal, that still represented an over 80% reduction in sulfur for every displaced ton of coal. Additionally, the plant used the studies of the St. Louis plant to argue that when coal and RDF were burned together, the sulphur would stick to the waste ash from the RDF. Supporters of the Ames plant argued that RDF not only contained less sulfur itself, it could greatly reduce emissions from high sulfur coal. In 1968, Ames had spent $200,000 on a scrubber, to remove solid pollutants from the largest of the local power plant’s four generators. Although utilities officials were not certain there were health consequences from the release of sulphur and nitrous dioxide, they remained concerned about the pollution the other generators produced.

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106 “Midwest, East Clash over Acid Rain Controls,” The Kansas City Times 10 April 1980, A-8
The plant’s main problem, and probably the one that concerned the DEQ, was its cost. Instead of dropping to 60 cents a ton in the early 1980s or producing a profit of over $2, as the city had later predicted, the disposal fee for the Ames resource recovery plant went through the roof. In 1977, the per ton cost was $11, while the rest of Iowa was paying between $4 and $7 to use landfills. The town of Gilbert paid $8,000 a year to use the Ames facility, ten times the amount it would have cost to use the Boone County Landfill 20 miles away. Story County communities that signed the 25-year contracts began to question their decision. When the power plant increased its rates, many people argued that the city should sell it to another utility provider and replace the costly resource recovery plant with a landfill.\(^{109}\)

Because of mechanical or market problems, nearly all resource recovery plants across the country tended to cost more than expected. Another issue was that people were not producing as much trash as cities had predicted. While landfills last longer when less trash is produced, more trash allowed resource recovery plants to lower their costs. This is not the same as the environmentalist worry that resource recovery demanded large amounts of trash to exist. The Ames plant had enough trash to fulfill its role in the co-firing process. A lot of the money that plants made came from the separated resources that were sold not just from the energy side, and this was a problem with having less separated resources to sell. Ames expected to receive nearly 55,000 tons of trash in 1975, a number it thought would climb each year, but by 1977, the plant only received about 48,500 tons. This decrease resulted from lighter packaging and an economic recession which curbed consumerism and waste. Technical difficulties combined with the poor markets made resource recovery a less attractive disposal solution for most communities.

\(^{109}\) Ibid; author interview with John Pohlman.
By 1981, only two percent of the country’s MSW was being processed in resource recovery plants.  

Responding to objections of the plant’s high cost, Ames Public Works Director Arnold Chantland, whom the plant would later be named after, stated, “We need to put some price on the value of land. This system doesn’t use up land as in landfills.”  

Once the energy crisis had passed, most other cities with resource recovery had no other environmental good to justify their plants. Resource recovery did decrease the need for landfill space and risks of groundwater pollution, but as time went on environmentalists worried more about dangers from air pollution than land related issues.  

As farm land was its “local amenity,” however, Ames could continue to use the farmland justification, and consider itself, as Chantland later said, “a leader in protecting our environment.”  

The new president, himself a farmer, agreed with this mentality. While campaigning at the Iowa State Fair in 1976, Carter called farmers the “first and foremost environmentalists.” Additionally, he said, “One of the greatest tragedies of the last eight years is the way the administration has cut back on farm conservation efforts. As a companion to building production and stable prices, we must also have conservation programs, to build back the land.”  

During the 1980s, the plant worked out many of the mechanical difficulties most other resource recovery plants across the country never lived to solve. By the late 1970s,

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not only had EPA started promoting the European-style WTE plants, but it also encouraged communities to take a “system vendor” approach to resource recovery. Under this method, a city would hire a company that took full legal, environmental, and mechanical responsibility for the plant. The Ames plant was an anomaly on both counts: it was municipally owned and operated, and it continued to use an American RDF system. With its unusually high employee retention rate, the Ames plant built up a body of workers with the knowledge to anticipate trouble and who, through constant trial and error, were largely able to eliminate the flaws in the plant’s operating system.

The Crisis of Confidence

The federal funding mechanism for this new types of plants was the Presidential Urban Policy Program, which fell under the jurisdiction of the RCRA and the EPA. Sixty-three projects received federal money to use on their local plants, often for loan guarantees. The only condition was that the plants had to use an already demonstrated technology. If the Ames plant had started under this system, it would have been rewarded for using St. Louis as a model. After a slow start when Carter first took office, the administration put a very organized structure into place, portioning the funding and responsibilities into different focuses. For fiscal years 1980 and 1981, Carter designated a total of $20 million for local assistance; $18 million for state solid waste planning; $10 for technical assistance panels; and $24 million for the development of new technology. The largest amount of money for resource recovery, however, came from his Energy Security Corporation (ESC), which Carter announced during his famous “Crisis of Confidence” or “Malaise” speech July 15, 1979.\textsuperscript{115} ESC plans that never saw the light of

\textsuperscript{115} After his first six months, and editorial in the Washington Post said that Carter had “made only mild, and often contradictory statements about the issue” of materials conservation. It complained that he
day signified the end of a decade-long cordiality between materials recovery and energy conversion factions and all of the regular Americans who saw different ways to make the best use out of garbage.

In his “Over the Coffee” column of Friday, July 13, 1979, the *Des Moines Register*’s Donald Kaul lamented that

Two months ago, you hardly ever heard of synthetic fuel; now you hear of little else. Congressmen are knocking each other down to get in the forefront of those in support of ‘synfuels’ as they are called. President Carter is said to be on his way down from the mountaintop with a crash program to develop a synthetic-fuels industry. It seems to be an idea whose time has come—which is a fair indication of what rotten times we live in. Synthetic fuels is a rotten idea. It’s the modern version of the medieval search for the Philosopher’s Stone, a mythical method of turning lead into gold, and about as practical.\(^{116}\)

The “mountain top” that Kaul referred to was Camp David, where Carter had been since July 3, after returning from the Tokyo Summit to discuss energy with the leaders of Japan, Great Britain, West Germany, Italy, France and Canada. While he was overseas, tensions about energy at home had been growing. On June 21, the nation’s independent truckers held strikes across the country to protest the high cost of fuel. In Levittown, Pennsylvania, where truckers blocked off the freeway exits in one part of town, community members joined in, starting “the nation’s first energy riot.”\(^{117}\) It was rioters against local police, as well as “officers from local townships and nearby counties, along

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\(^{116}\) Donald Kaul, “Over the Coffee,” *Des Moines Register*, 13 July, 1979, 17A

with a squad of state troopers, and Philadelphia’s K-9 corps with its police dogs.”

On the second day of the riot, protestors set a couch on fire, followed by a car, then oil from nearby gas stations. The Levittown Riot ended on the third day, but there were 100 injuries and 170 arrests in the suburb. At the beginning of July a new poll showed that Ronald Reagan and Gerald Ford were running ahead of Carter for the 1980 elections. The president was supposed to give a national speech on the energy situation on July 5, but he cancelled the speech the day before, deciding to first hold a domestic energy summit, where he tried to get the ideas and opinions of as many different people as he could, what scholar Daniel Horowitz called “consulting broadly.”

After the middle of the decade, Americans approached the energy crisis moodily, and so did President Carter. Although tens of thousands of Americans responded to the president’s call for solutions, the fact remained that many Americans did not believe there really was an energy crisis, for various reasons ranging from beliefs that the oil companies were just trying to make more money to arguments that “energy crisis” simply meant Americans would not be able to waste as much energy as they had been. Carter made energy the center of his presidency, and as Melosi has said “moved the nation closer to a holistic view of the energy problem,” toward the notion that the issue was not just an immediate shortage but a problem with our extravagant handling of energy in general. Still, he was not able to winningly approach those with different views or degrees of enthusiasm than he had, including Congress. When Carter did not get the

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120 Melosi, Coping with Abundance, 288, 293
congressional support that he wanted for his national energy plan, he took what the conservative Evans-Novak Political Report called a “potentially suicidal posture” of claiming the Congress, led by fellow Democrats, was just working for the oil interests. Soon afterwards, he “suddenly switch(ed)” to a “we’re-all-in-this-together approach that rescued vital elements of the program and saved him from Congressional disaster” but the relationship never warmed too much.\footnote{Roland Evans and Robert D. Novak, “Evans-Novak Political Report,” 21 June, 1977, No. 294, 1} Historian Peter Carroll has said that Carter’s relationship to Congress was especially difficult because the post-Watergate Congressional elections of 1974 to 1978 had brought in politicians, who were exceptionally-skeptical of executive authority.\footnote{Peter Carroll, \textit{It Seemed Like Nothing Happened} (New York: Holt, Rinehart and Winston, 1982), 210} Despite Carter’s difficulty getting his agenda passed, energy expert Daniel Yergin thought much of the country was being foolish for ignoring him:

\begin{quote}
By 1985 or 1986 or 1987, if present trends continue, we’ll be staring at an energy crisis far worse that the one we went through in the early 70’s. And then our present boredom with the energy problem, and with the Carter Administration’s efforts to cope with it, will seem like complacent sleep. In that event, the reality we wake up to is apt to be frightening. Prices will double or triple, in real terms, within a short time. The standard of living of every American will nosedive. The international monetary system will shudder and shake. Industrial nations will be pitted against each other in a bruising scramble for oil. The Western alliance could be shattered. In a number of countries, democracy itself might not be able to survive.\footnote{Daniel Yergin, “The Real Meaning of the Energy Crunch,” \textit{New York Times Magazine} 4 June 1978, 32.}
\end{quote}

The Department of Energy, which replaced ERDA and FEA, started in August of 1977. Congress finally passed the energy bill in 1978, but two months later OPEC announced it
was raising its prices 14.5 percent and Iran decided to stop exporting oil altogether.\textsuperscript{124} Gas shortages and rationing became common place in cities by the spring of 1979. In these tense times Carter formulated his new energy plan, which centered on two main concepts, the formation of an Energy Security Corporation and the production of synthetic, or synfuels. With the pressing concerns about energy, material conservation was getting lost in the background.

When Kaul objected to the high-tech synthetic fuels in his \textit{Des Moines Register} column, he was joining environmentalists across the country. Synfuels turned materials like oil shale, coal, and tar sands into oil and liquid gas, and they were especially interesting to the president because they were the most viable form of alternative transportation fuel. Problems with gas had been the country’s worst experience with energy shortages. Environmental groups like the Sierra Club, however, called the president’s plan to pursue synfuel technology a “disaster.” To these nay-sayers, synfuels had great potential to cause environmental harm, used too many other precious resources like water and land, were too expensive, too risky, required too much bureaucracy and did nothing to encourage voluntary conservation, which was the easiest and cheapest way to save energy.\textsuperscript{125} Throughout the 1970s the American people had seen their tax dollars invested in numerous well-meaning, but ultimately unsuccessful energy-producing endeavors, including the resource recovery demonstration projects. Many expected that synfuels would be another such flash in the pan. As Kaul had written about a week before the president’s speech, “The energy ‘crisis’ has been going on for some time, 10 years or more. To arrive at the summer of ’79 needing still more time to find solutions to

\textsuperscript{124} Horowitz, \textit{Crisis of Confidence}, 186; Carroll, \textit{It Seemed Like Nothing Happened}, 292.  
the problem is to be bankrupt of will. New solutions are not what’s needed. Courage to carry out the old solutions, that’s what’s needed.”

Ames would be one of the few places to carry out the old solution of resource recovery.

Carter’s budget specifics for his Energy Security Corporation included an unprecedented $88 billion. The Urban Waste Program of the Department of Energy was to receive an also unprecedented $2.2 billion allocated as “seed programs” for its responsibilities. These included finding and funding “Resource Recovery projects which produce synthetic fuels,” loan guarantees, also for the stipulated synthetic fuel producing projects, and price supports for synthetic fuel projects.

This emphasis would have necessitated a new round of resource recovery technologies. It did not necessarily end the materials recovery side of resource recovery, but for the energy recovery part, the administration was looking for plants that produced fuel that could be used in vehicles. The true pyrolysis systems, like Occidental Petroleum’s flash pyrolysis, would have qualified as a synfuel producer, but all of those plants had failed.

Once the DOE began circulating its “Comprehensive Waste-to-Energy Plan,” the recycling proponents within the resource recovery group saw that they had been left out of the administration’s new vision. In the discussion section of the plan, material recovery played a “very complimentary” role, but in the strategy part of the plan that outlined how the agency would proceed, every goal was, “related to the production of energy from waste without any provisions concerning DOE’s efforts to achieve

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126 Kaul, “Over the Coffee,” *Des Moines Register* 9 July 1979, 7A.
compatibility between the production of waste-to-energy and recycling.” The paper industry argued that this was unfair because if cities received subsidies for a facility that burned paper, they would always choose that over setting up a recycling facility. They argued that this violated the congressional intent of the Resource Conservation and Recovery Act. To ameliorate this, the paper recyclers requested that the Office of Budget Management coordinate all of the agencies involved in resource recovery, so there would be accountability among the agencies and one could not just exclusively pursue its own goals. They requested that Harvey Yakowitz, Chief of the Department of Commerce’s Office of Recycled Materials, be put in charge of the WTE program and that the federal government denied assistance to plants that “burn waste paper that could be otherwise recycled for a use other than as a fuel,” or to any city that “requires all waste (including recyclables) to be burned by a waste-to-energy facility.”

When the paper representatives met with the DOE, the government officials were “totally unresponsive.” The attorney for paper recyclers wrote a letter to the Deputy Assistant to the President saying that, “We were told on several occasions [sic] that all the paper recycling industry wanted to do was ‘stop progress’ and have ‘DOE do nothing.’” He concluded that, “it appears that DOE intends to distribute federal subsidies on a case-by-case ad hoc basic [sic] depending on the subjective factors held by each group of reviewers.” This was a major change from the spirit of cooperation that occurred at the pre-RCRA hearings in 1976 and the mandates of RCRA. Most importantly, it forced the

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129 Ibid. (unnumbered pages).
130 William L. Kovacs letter to Mr. Michael H. Chanin Deputy to the Assistant to the President, 10 October 1980, 1,2 Jimmy Carter Library, Domestic and Policy Staff Energy and Natural Resources, Ward Schirmer, Box 42 Waste Energy.
issue of recycling or technology. The DOE and EPA had both already decided against
the technologically complex facilities that offered source separation in favor of the
European-style mass burn facilities. This could have been at the heart of the DOE
official’s response to the paper company—the agency already knew it was not interested
in any new plants that did materials recovery. New synfuel plants could be investigated
without being tied down by the mechanically clumsy efforts that had inhibited the
American plants throughout the past decade. The consequence of this was that now
people would have to choose which they thought was better for the environment, the
economy and the energy needs of the country, or whichever of those three priorities they
thought was most important. If government funding was subsidizing a type of method
that excluded the other, there could be no peaceful co-existence.

This was not the situation the paper recyclers wanted to see. Without the same
kind of subsidies as WTE facilities, their path would have no chance. And this was not
the path that the American people wanted to see. The United States Conference of
Mayors lamented the division that was unfolding. Commenting on the DOE’s plan and
the schism, the mayors stated that,

this issue is one that could be easily resolved if these two
groups were to come together and work jointly towards
solutions. Recyclers could bring tremendous political
support to waste-to-energy facilities, if they were
convinced that these facilities were part of a
comprehensive, balanced solid waste management program
which included the maximum feasible recycling. Similarly,
recyclers could benefit from support in the waste-to-energy
industry by obtaining project support and financing from
this industry in the development of recycling programs.131

Development Plan,” 27 August 1980, 19, Jimmy Carter Library, Domestic and Policy Staff Energy and
Natural Resources, Ward Schirmer, Box 42 Waste Energy.
Mayors considered the issue from a waste disposal perspective and believed that recycling and WTE complimented each other, that both would help decrease disposal costs, and that recycling was immediately important because it would not take much time or money to get started, whereas WTE plants took anywhere from five to seven years to begin operating. The failures of the 1970s had also showed the importance of having a backup plan in the event of mechanical glitches.

When Carter lost the election to Reagan, less than a month after there was still infighting between the technology and recycling supporters, the debate became moot. The DOE’s plans never even made it to Congress. The Resources for the Future Survey mentioned earlier had shown that when Americans had the choice of caring for the economy, energy, or the environment, they would be most likely to support the environment if they could also do one of the other two. As the divergent interests and goals of those involved in solid waste issues became increasingly entrenched, the possibility of a nationwide solid waste mentality that cared for economy, energy and the environment was lost, and with it, the faith in high-tech environmental solutions. No other national pursuit of the 1970s had been so accommodating to people with such different points of view about those issues, people with diverse ideologies and agendas saw an urgent problem and hopefully negotiated plans to solve it, while meeting the needs of more than one segment of society. “We can’t afford to sit on our laurels and wait till the last gallon of gas or oil is in the tank,” Joe Lynch, of Alabama, wrote in a letter to President Carter. “This is the country that made the atom bomb, put man in space and accomplished other great feats of endeavor. We cannot sit ideally [sic] by and wait

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132 Ibid., 20
for Diet Smith or Buck Rogers to arrive from outer space in hopes that they may solve our problems. Something must be done today!"\textsuperscript{135}

While the rest of the country was debating and eventually abandoning the resource recovery dream, the Ames plant continued to plug along. The last major mechanical difficulty of the millennium occurred in 1987 when a propane tank exploded in the shredder.\textsuperscript{136} As plant superintendent John Pohlman recalled, the blast “took the wall off of the South side of the building, and almost blew it out onto Lincoln Way.”\textsuperscript{137} After that, exemplifying the flexibility of the old resource recovery discussions, the plant simply announced that it would take propane tanks for free, so that people would bring them in rather than sneaking them in their trash. The Ames plant was not a financial success. It operated in the red for over 20 years, sometimes costing four times the expected amount. The effort was not great for the economy, but the city was addressing the two goals of energy production and environmental protection. As a city spokesperson told the \textit{Tribune} in 1995, during those years of deficit, the plant “saved nearly 800,000 tons of garbage from being deposited on more than 80 acres of farmland—enough rubbish to fill Hilton Coliseum (Iowa State University’s basketball stadium) 400 times.”\textsuperscript{138}

\textsuperscript{135} Letter from Joe D. Lynch (Phoenix City, AL) to “Sir” (James D. Schlesinger), James Schlesinger, Box, 11, Energy Suggestions Correspondents 19 Citizen.
\textsuperscript{136} Author interview with David Sussman, 11 August 2009; Author interview with John Pohlman 6 May, 2009; Author interview with Rob Weidner 8 May 2009.
\textsuperscript{137} Interview with John Pohlman.
\textsuperscript{138} Joan Bundy, “Talkin’ Trash: Ames Sets the Pace,” Update ’95, a supplement to the \textit{Ames Daily Tribune}, 10 February 1995, 8.
Chapter 4: The Resource Recovery Crisis and the Rise of Recycling

In the summer of 1979, attendees of the Engineering Foundation Conference "Municipal Solid Waste as a Resource: The Problem and the Promise," must have been in fine spirits as they talked about the state of resource recovery. Yes, there were problems, but overall the engineers "seemed to feel that the industry was now getting up off its knees and just beginning to walk."\(^1\) In fact, while the field had "experienced growing pains"—namely because of "overenthusiasm and inadequate technical and managerial skills"—the resource recovery experts agreed that the fruition of waste recovery schemes "nevertheless seems to be an absolute requisite for an orderly transition through the 1980s and into the 21st century."\(^2\) Speakers identified several obstacles facing the future of resource recovery, but the main one seemed to be a lack of communication between plant operators and builders, politicians, officials, and businesses. Because of this failure to communicate, the meeting attendees determined that,

many problems and roadblocks are encountered and eliminated time and again with very little being added to a general 'body of knowledge' which can be called upon in the future. With so much effort being devoted to solving and resolving the same problems, little is left over for truly advancing the state-of-the-art.\(^3\)

They also agreements that the DOE and the EPA "should get their act together. Both agencies have valid and valuable interests in the development of this technology and an increased degree of interagency communication would be of benefit to all concerned."\(^4\)

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\(^2\) Ibid., v.

\(^3\) Ibid., viii.

\(^4\) Ibid., ix, v. (See chapter 2 for more on the relationship.)
A year and a half later that problem became irrelevant. In fact, neither organization would have much of an act pertaining to solid waste in the 1980s. Jimmy Carter’s grand synfuel plans were abandoned once Ronald Reagan took office and other money for the department’s urban waste program expired in 1981. Other factors that spelled the demise of resource recovery were the Supreme Court case of Philadelphia v. New Jersey, new fears of pollutants worse than the last decade’s problem of sulfur dioxide, and changing regulations. Even though Americans would not come to it for the reasons its proponents were espousing, recycling would take the place of resource recovery as America’s preferred solid waste disposal technique du jour. Only Ames, Iowa, would be able to carry resource recovery into the 21st century.

**Reagan and the Environment**

The EPA had never been very enthusiastic about being involved in solid waste management, and funding priorities of the Reagan Administration allowed the agency to basically dump the field from its agenda. Reagan cut the solid waste budget was cut from $29 million in 1979 to $16 million in 1981. Just one year later the entire solid waste budget was only $320,000. In those same years, the number of employees in the office went from 128 to 74 to 1. In 1982, at congressional hearings for the Reauthorization of the Resource Conservation and Recovery Act, of the 24 witnesses who testified before the Senate Subcommittee on Environmental Pollution, all 24 discussed hazardous waste, while only a handful mentioned anything at all about municipal solid waste disposal.\(^5\)

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That hearing was also the introduction of Rita Lavelle, the new Assistant Administrator for Solid Waste and Emergency Response, the position which was in charge of RCRA and had been vacant for over a year. Lavelle started her job two weeks before the hearing, and Senator Jennings Randolph of West Virginia asked if the new role was a “docile horse or a bucking bronco,” to which Lavelle replied, “I think a bucking bronco.”

Future presidential candidate and U.S. Senator Gary Hart tried to find out the state of the EPA from the newbie. Reagan’s EPA Administrator Anne Gorsuch recommended cutting the department by three-quarters. Sounding as irritated as Leo Ryan had when questioning the EPA, ERDA and FEA in 1976, Hart asked Lavelle if she agreed with Gorsuch’s belief the department could be substantially cut and whether or not her employees were over worked. He said,

> Your appearance and testimony suggests we are moving right along and we are on a learning curve and things are proceeding and you are toughening up these regulations, and so forth. That is not my perception and I don’t think it is the general perception. I could be wrong, the press could be wrong, and the American public could be wrong. I think there is a frustration on the part of the legislators when a law is passed and 6 years go by before it begins to be effective. When we are constantly told that agencies have enough employees and that they can, in fact, cut back by a third or a half and still do the job, and yet months and months and years go by and regulations aren’t promulgated on the grounds that these are complex subjects, I think the American people get frustrated.

Hart was hoping to get an opinion from someone not yet entrenched in the agency’s politics, but Lavelle stuck with the EPA script.

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6 Ibid., 30  
7 Melosi, *Sanitary City*, 365  
8 Reauthorization of the Resource Conservation and Recovery Act," 26
Gorsuch, along with Reagan’s Secretary for the Department of Interior James Watt were both tremendously unpopular figures, who seemed to encourage grassroots environmentalism. According to Martin Melosi, "As Watt's antienvironmentalism became more outrageous, membership in major environmental organizations increased and continued to do so even after his resignation." Watt sought to increase offshore drilling and extract resources from public lands. For her part, Gorsuch was in charge of compiling a list of environmentally hazardous sites that the new Superfund law was supposed to regulate. There were thought to be over 14,000 such sites, but when Gorsuch revealed the list, a year and a half late, she only had an inventory of 418 abandoned dumps and the agency had done very little to start addressing their problems. When she refused to provide more information, Congress voted to cite her in contempt in December of 1982, and she resigned the following year. Lavelle’s term with the EPA would end in 1983 as well, after she perjured herself about harassing a fellow EPA employee who criticized the agency and had a private meeting with two businesses, one of which was Monsanto, that were facing a $40 million hazardous waste clean up at the Waukegan harbor in Illinois.

Besides the scandals and controversy, President Reagan’s New Federalism policy, which increased responsibility on the non-federal level, was affecting local and state environmental actions. The federal government had funded 53 percent of state and local public works capital investments in 1977, but in 1982 that number fell to 40 percent. Reagan was more interested in spending money on national defense and security than on

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the increasingly sprawling infrastructures of the cities. Hazardous waste concerns moved into the spotlight after national incidents at Three Mile Island and Love Canal, a former chemical dump in Niagara Falls, New York that began to leak during a large rainfall in 1978. Neighbors in the Love Canal area began to organize and protest after charges of birth defects, miscarriages, and high rates of cancer started to surface. Their group, the Citizens Clearinghouse for Hazardous Waste, became a national opponent of WTE projects in the 1980s.\(^\text{11}\)

Local officials who had grown used to money and support from the federal government for their solid waste programs were not ready to conform to RCRA standards without RCRA money.\(^\text{12}\) Groups that had been irked by the attention lavished on high-tech resource recovery efforts throughout the 1970s, saw the opportunity in the midst of the changing waste atmosphere to promote their baby: recycling. As Melosi said, "Once regarded as simply a grassroots method of source reduction and a relatively innocuous protest against overconsumption in the 1960s, recycling in the 1980s became an alternative to—or at least a compliment to—more traditional disposal methods."\(^\text{13}\)

**Early Recycling Philosophy**

Two of the most vociferous national promoters of recycling starting in the 1970s and 1980s respectively were Neil Seldman’s Washington, D.C. based Institute for Local Self-Reliance (ILSR) and the Center for the Biology of Natural Systems (CBNS), which moved from St. Louis to New York in 1981, when its founder Barry Commoner received a position at Queens College. Seldman, a Ph.D. who studied at Cornell University’s


\(^{13}\) Melosi, *Sanitary City*, 411.
School of Industrial and Labor Relations and Georgetown’s Institute of Sino-Soviet Relations, co-founded the ILSR in 1974. The cornerstone of ILSR’s beliefs was decentralization, and its members believed the country’s problems started long before the proliferation of the chemical industry in the 20th century. In a speech for the E.F. Schumacher Society in Stockbridge, Massachusetts, about fifty miles away from Springfield where Shay’s Rebellion took place after the American Revolutionary War, ILSR co-founder David Morris, who also had studied Industrial and Labor Relations at Cornell, attributed the writing of the U.S. Constitution to Shay’s Rebellion and asked how things would have been if we still lived under the Articles of Confederation.

“We’ll never know,” he said,

What we do know is that under the Articles of Confederation we fought the mightiest nation in the world—and won. Under the Articles of Confederation we passed the Northwest Ordinance, a remarkable document which developed a unique mechanism for sharing power with newly created states from western territories. Under the Articles of Confederation we developed a sense of being Americans while at the same time retaining a firm sense of local place.

The nostalgia for the old, smaller form of government fit the philosophy of the audience. Ernst Friedrich Schumacher was the “spiritual father of the appropriate technology movement” and the author of Small is Beautiful: A Study of Economics as if People Mattered. He was a hero to Seldman and the ILSR.

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Schumacher, who was born in Germany but later moved to England, saw the centralization of the modern world coming from the growth of large cities or “megalopolitanization.” It was the widespread use of fossil fuels and the improvement of agriculture also thanks to fossil fuels that allowed people to live further from the resources they needed for industry, and to clump together, unnaturally, in centralized areas. According to Schumacher, “For mammals to chose [sic] a pattern of living like communal insects may be described as a new and fundamental step in their social evolution, but it is not immediately apparent that it is a step in the right direction.”

There were three main “megalopolitan agglomerations” in the United States: “Boswash,” containing the cities from Boston to Washington, D.C.; “Chicpitts,” all of the cities from Chicago to Pittsburgh; and “San-San,” the Western coastal areas from San Diego to San Francisco. For Schumacher, “In these three immense agglomerations there are all the evils of congestion, and outside them there is an emptiness that is both sterile and stultifying.” He believed that technology fed these megalopises, because it developed “large, complex, highly capital-costly production units,” which required and drew massive amounts of people. People had to go to cities to find jobs because that is where all of the production was taking place and the industrialization of agriculture had tremendously decreased the number of people needed on farms.

Writing thirty-five years earlier, the economist John Maynard Keynes had espoused an optimistic economic philosophy that saw this growth in capital as a positive that would lead to great things for the world. In an essay entitled “Economic Possibilities

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17 Ernst Friedrich Schumacher, “Patterns of Human Settlement,” Ambio v. 5, no. 3, 1976, 92, 91, 93.
18 Ibid., 91.
19 Ibid., 94, 93.
for Our Grandchildren,” Keynes suggested that the continued progress of science would lead to the ability to meet all of humanity’s absolute needs. “If capital increases, say, 2 per cent per annum,” he wrote, “the capital equipment of the world will have increased by a half in twenty years, and seven and a half times in a hundred years. Think of this in terms of material things—houses, transport and the like.” Keynes thought in the future that the big problem would be learning how to handle all of the leisure time people would have. People, he said, could whittle their work hours down to three-hour shifts in time, “with a little more experience we shall use the new-found bounty of nature quite differently from the way in which the rich use it today, and will map out for ourselves a plan of life quite otherwise than theirs.” Although Keynes was British, his economic ideas suited the American people well. Historian Donald Whisenhunt noted that, “Americans have very seldom been concerned about excessive growth,” but in the 1960s and 1970s, thanks in large part to Silent Spring, as they became more mindful of the consequences and the price of growth, the precariousness of resource security became more worrisome. The most influential writing about resource scarcity usually was attached to discussions of population. Paul Ehrlich’s Population Bomb and Garrett Hardin’s “Tragedy of the Commons,” an article that appeared in Science magazine, were two of the most influential neo-Malthusian works in the 1960s. Both works warned of the dire situations that would occur if too many people continued to consume too many resources.

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21 Ibid. 5
Optimistic Americans often reacted to these concerns of scarcity in a Keynesian way that entailed the opposite intention of scientists like Ehrlich and Hardin. Both scientists assumed a limit on resources, as Hardin said, “in terms of the practical problems that we must face in the next few generations with the foreseeable technology, it is clear that we will greatly increase human misery if we do not, during the immediate future, assume that the world available to the terrestrial human population is finite.”\textsuperscript{23} Many Americans, however, felt that if the threat of scarce resources was putting the world on the brink of disaster, then an abundance of resources would solve many of the world’s problems. It was this line of thinking that Schumacher was reacting to. “The road to peace, it is argued, is to follow the road to riches,” he said.

This dominant modern belief has an almost irresistible attraction as it suggests that the faster you get one desirable thing the more securely do you attain another. It is doubly attractive because it completely by-passes the whole question of ethics: there is no need for renunciation or sacrifice; on the contrary! We have science and technology to help us along the road to peace and plenty, and all that is needed is that we should not behave stupidly, irrationally, cutting into our own flesh.\textsuperscript{24}

Schumacher found several flaws with this kind of thinking. In the first place he did not believe that there were enough resources for the consumption of rich countries to be expanded to poorer ones, as the environment was “strictly limited.” Humans could aim towards a “limited objective, but there cannot be unlimited, generalized growth.” He cited Barry Commoner’s argument that new technology caused new problems that would have to be solved. He also wondered what inequities would exist under the pretense that everybody had “enough.” Finally, if the new world were too materialistic and if

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everyone were only consuming, it might destroy the human spirit. Schumacher called the push to provide everyone a high level of resources the “antithesis of wisdom,” saying that the way to stop war and want was to decrease needs not to fulfill and expand them.\textsuperscript{25}

Recycling proponents like the ILSR approached the issues of waste and resource recovery, following this line of thinking. “Ever bigger machines, entailing ever bigger concentrations of economic power and exerting ever greater violence against the environment, do not represent progress: they are a denial of wisdom,” Schumacher said. “Wisdom demands a new orientation of science and technology towards the organic, the gentle, the non-violent, the elegant and beautiful.”\textsuperscript{26} The main thrust of the recycling movement was not economically or efficiency based like resource recovery, but rather it embraced an ethical posture that nearly all of its adherents shared. In other words, recycling proponents, like resource recovery supporters, could argue that saving aluminum or steel or paper from the waste stream would save energy, and if market subsidies had not favored virgin materials, it would have saved money. Even if they were wrong, though, and a bad market meant that separated materials sometimes had to be taken to the landfills, recycling would still be inherently good because it helped instill an environmental ethic in those who recycled. “Recycling was practical and educational,” Seldman said. “It was a vehicle for restructuring our thinking about the determinants of waste in our society. It was a path away from the concentration of political and economic power which treated virgin resources as a grand barbecue of the American continent, and

\textsuperscript{25} Ibid., 29, 25, 28.
\textsuperscript{26} Ibid., 29.
similarly exploited the resources beyond our borders.”

In the 1970s ideal of resource recovery, the tension between the goals of conserving resources and creating energy allowed some flexibility in methods. When trash could most effectively save resources, they were saved; when there was little economic or environmental benefit to saving a resource at a certain time, it would be burned for energy production. Recycling was not goal-oriented in the same way. The immediate result was important and its proponents argued that recycling involved a smarter use of resources than resource recovery, but they did not just promote recycling because it was a more efficient way to utilize materials. Seldman paraphrased Dan

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Cotter, director of Sonoma County Environmental Center, an ally of ILSR, saying that Cotter,

considers the greatest danger from centralized (resource recovery) plants to be the loss of an important environmental education media. If source separation and recycling programs are eliminated and the public is allowed to forget about the solid waste problem—in the belief that it is being take care of for them—then a serious blow would result in the ethical issues being presented in regard to planned obsolescence, overconsumption, and overpackaging.28

The ethical education recycling provided and the habits it formed were just as important as the other benefits. “It is what Aristotle referred to in the Ethics: ‘Moral goodness is the child of habit,’” Seldman and fellow institute member Dan Knapp wrote in the ILSR magazine, *Self Reliance.*29 In his 1997 book *Why Do We Recycle? Markets, Value, and Public Policy,* environmental scholar Frank Ackerman took the ethics track a step further, saying recycling could be understood as a “religious practice,” with its “symbolism” and “ritual observances” of “the weekly offering and collection” and the “modern miracle of transubstantiation, as old packages and papers come to life again.”30 S.L. Blum made the same analogy over twenty years earlier, when he said that “many environmentalists display an enthusiasm for recycling that borders on religious intensity.”31 Throughout the 1970s, adherents to this recycling “religion” definitely thought their approach made better use of resources than the alternatives of landfilling and high-tech resource recovery systems, but additionally, and perhaps more importantly, they hoped recycling would

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help change the consumers’ relationship towards the earth as well as towards their fellow humans.

Recycling in Action

The modern recycling movement received its big start after the first Earth Day in 1970. Americans had become increasingly less frugal in the post-war world. In 1950, over 27% of all wastepaper in the U.S. was recycled, but that number had dropped by almost 10% two decades later. The decline drastically reversed in the first six months after Earth Day, when inspired activists started 3,000 recycling centers across the country. Once started, citizens did not automatically embrace the idea. Because recycling often did not make a profit, many Americans did not see the point in going through the trouble of separating and taking materials to a special center. As historian Samuel Hays noted, the “momentary outburst of public sentiment” after the first Earth Day “generated only limited institutional capability or political staying power.” The effort received its biggest blow in the 1974-1975 recession. During the strapped times, recycled products, which often cost more than virgin materials, could not find markets and many recycling centers had to close their doors. While most abandoned the cause, there were as Seldman said, “an enduring group of adherents” who developed a “new

maturity” during the setback and began to use planning and accounting methods to achieve their goals.  

Recycling would get a boost from another 1974 event, however. That was the year ILSR opened. While the institute was interested in all issues related to decentralization, waste was one of its pet causes. Large scale resource recovery plants were particularly problematic to the new institute for several reasons. There was, of course, the philosophical divide between resource recovery proponents and recyclers. But ILSR, and others, were drawn to recycling because of the problems they saw in the cities. Large scale, centralized projects alienated city-dwellers and diminished their ability to control or contribute to their lives, creating “anxiety and a sense of powerlessness.” The effect of this, labor expert Richard Kazis wrote in Self Reliance, was that,

As a people we have lost a sense of vision; we have lost our collective imagination. This is due, in part, to the terror of living in a world which moves so quickly, where communication is instantaneous, crises constant, and eras end almost before they begin. And, in part, to the terror of living in a world always on the brink of disaster, a world hurtling toward a future in which tragedy seems unavoidable to all but the most optimistic. But the loss of imagination is even more deeply rooted in modern technology, subservient to the needs of business and/or the war machine, has led to a degradation of work.…  

The solution to this loss of power was smaller scale, appropriate technology efforts that provided jobs and utilized individual creativity and decision making.

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William Rathje’s argument that modern waste disposal techniques had eliminated the old practice of having people dig through garbage dumps would have been lost on ILSR, which lamented the fact that scavenging had become illegal. *Self Reliance* even featured an article in 1981, called “Making a Case for Landfill Salvage.” The article criticized EPA for publishing “hundreds of books on solid waste and many on landfills,” while spreading “misinformation, ignorance and sheer prejudice” in the few places it did mention landfill salvage.\(^{36}\) By using people instead of machines to salvage a landfill that received 250 to 300 tons of trash per day, about the amount of waste the Ames resource recovery plant processed, the scavengers could be expected to retrieve between $5,000 to $8,000 worth of material a month without spending any money on technology. This work could be done in the dump itself, or through a system called “highgrading,” which entailed the separation of garbage at the dump but immediately before it was combined with the already deposited waste.\(^{37}\) In his work on the scrap metal industry, historian Carl Zimring has noted that the lack of required capital and the autonomy of the work made waste handling a “very attractive prospect,” for many immigrants in the first half of the twentieth century. These waste dealers and scavengers, who were often Jewish or Italian, suffered social stigmatization because of increasing American sensitivity to issues of cleanliness. Zimring argued that the “tragedy of waste” was that Americans’ prodigious consumption caused the need for a profession of people who have to deal with


\(^{37}\) Ibid., 4.
waste and “yet the work itself remains marginalized in American culture and geography.”

ILSR, which saw the recycling movement as on par with other activist groups of the 1960s and 1970s, was directed towards ideals rather than societal standards. Unlike the immigrant scrap dealers, who were trying to find a niche to gain economic security and possibly wealth in an often ethnocentric system, the institute formed in reaction to the increasingly acquisitive, centralized nature of society. Because the institute was trying to create new societal values, it did not have to address problems of the 20th century caste-like division that had existed between those who made waste and those who picked through it. The author of the ILSR article Dan Knapp, a salvage operator himself, did not address any of the social issue connected with the job of scavenging, only saying, “Admittedly, sorting through mixed wastes does not sound like a pleasant job, but it is not all that bad in practice. And it is never boring.”

The benefit of putting humans to work was key to the push for recycling by ILSR and other community based recyclers. Seldman often liked to say that it took $15,000 invested in recycling to put one person to work, while one job in resource recovery cost $1 million. In his book Garbage Wars: The Struggle for Environmental Justice in Chicago, sociologist David Naguib Pellow used a model developed by he and his colleagues called the “treadmill of production” to show the relationship between labor,
recycling and the environment. Laborers were always working for companies that were trying to maximize their profits. The two best ways to maximize profits were to withdraw resources from the environment and to decrease the workforce. To save their jobs, workers pushed for the withdrawal of more resources, while environmentalists ranked the needs of labor behind efforts to protect the environment. According to Pellow, it was the “capitalist framework,” which put managers “under continual pressure to produce more profit and increase shareholder value” on the treadmill of production, but it was much more common for the groups to attack each other than the system.\textsuperscript{42}

The result of these divided interests was that when recycling began to start gaining popularity again in the early 1980s, the environmentalists promoting it were far less interested in or sympathetic to the cause of labor than the early recycling proponents were.\textsuperscript{43} ILSR, however, remained opposed to resource recovery for reasons other than just the environmental. In a speech for the American Society of Civil Engineering Conference in 1979, Seldman listed the “ethical presuppositions (that) help guide our evaluation of whether technology serves our normative goals”:

- that we include in our decision-making processes the concerns of future generations
- that we strive for as humanly-scaled economy as possible, so active citizens can comprehend and control our communities, cities and nation
- that equity be provided to those most in need of goods and services.\textsuperscript{44}

\textsuperscript{42} David Naguib Pellow, \textit{Garbage Wars: The Struggle for Environmental Justice in Chicago} (Cambridge, MASS: The MIT Press, 2004), 61
\textsuperscript{43} Ibid. 62, 63
Seldman said Schumacher had summed up all of the goals with his maxim about appropriate technology: “local production from local resources for local consumption.”

Even though this interest by recycling proponents in societal issues was not the norm, pro-recyclers started to talk about a “paradigm shift” of waste management by the end of the 1970s. Seldman and Knapp said the paradigm shift was a change from ideas of high-tech “mass” systems that indiscriminately lumped and eliminated all garbage. The shift came from new recyclers who “pick(ed) up the other end of the stick” and considered local ways to handle waste to benefit local people. “The difference in the two paradigms,” Seldman said, “is based on differing images of reality, science and ultimately of human nature and the actual image of the good life.”

A shift was starting to take place, but the extent to which the shift was as value-oriented as Seldman hoped was questionable.

In his 1974 work, Donald Whisenhunt said that America’s “obsession with size” would be the “most difficult attitude” environmentalists would encounter. One of his examples was the excitement of cities “until very recently at least” waiting to see how much they had grown in the national census and often making their own early, exaggerated results to look like they had grown more than they had. In other words, bigger is better. As the country moved away from resource recovery towards recycling

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45 Ibid., 12
47 Donald Whisenhunt, The Environment and the American Experience: A Historian Looks at the Ecological Crisis (Port Washington, N.Y.: Kennikat Press, 1974), 99, 100, 98; Anyone watching TV in 2010 would see the census advertisements, many of which even feature Hollywood’s most famous environmentalist and appropriate technologist Ed Begley Jr. Begley’s ads don’t mention anything about growth, but most of the other census advertisements indicate that you need to be counted so that your city will have higher numbers and will receive more federal and state money.
over the next decade, it would not be moved so much by an existentially reevaluation as by fear. The socially conscience activist-scientist Barry Commoner, led his anti-incinerator crusade based less on social and lifestyle problems of high-technology systems as on their possible dangers.

**Changing Notions of Trash**

A good indicator of the sudden acceptance of recycling as a mainstream solution was its promotion in the *Reader's Guide to Periodical Literature*. From 1890 to 1980, one looking in the famous index to find information about trash conversion would look under "Refuse" and find the subheading "Utilization of," but in the March 1981-February 1982 volume, there were no listings under "Utilization of." An ideology at least 90 years old—the open-ended idea that waste could be utilized somehow, possibly in a way that would be popular in one year but not in the next or that it would be used in the future in a way that had never been thought of up until that point—had disappeared. By 1982, the most acceptable, or at least most talked about, possibility of how waste could be used was summed up in two words: "see recycling." Reader's Guide based its entry on a truly changing behavior. In less than two decades the number of cities with door-to-door recycling collection services would increase from 140 to 15,000. By 1988, the EPA set a goal of twenty-five percent recycling of MSW in its "Solid Waste Dilemma: An Agenda for Action," and there were 10,000 drop-off and buy-back recycling centers across the nation in 1989. An issue of *Environment* magazine that same year featured an article by a pleased Seldman, stating that the massive success of recycling "caught the national environmental groups off guard. They never imagined that grassroots groups on their

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49 Melosi, *Sanitary City*, 411.
own could change federal policy." He added that the environmental groups, "would have settled for less."\(^{50}\)

Despite optimism at the end of the 1970s and the effort of the Public Utilities Regulatory Policy Act (PURPA), the waste-to-energy industry started to flounder without governmental support to urban areas. Cities that were losing federal funding across the board could not afford new money to invest in waste-to-energy plants. The media continued to run positive stories about the financial prospects of WTE, but by the early eighties the situation did not look as bright from inside the industry. Michael Dingman, the CEO of Wheelabrator-Frye, one of the top WTE plant operators, stated "If all the jobs (to build new plants) that were publicized in various papers really were jobs ... the garbage-to-energy business would be a helluva business. But most of it is newspaper puff."\(^{51}\) Even if government support had continued, Dingman did not seem to believe that there would have been a great market for waste-to-energy plants, saying, "When the existing garbage dumps get closed, which is easier said than done, and when the people who involve themselves decide to truly solve the problem, then facilities like ours will be a welcome addition to the community."\(^{52}\)

**Philadelphia v. New Jersey**

It was a Supreme Court decision in 1978 that allowed cities to not “truly solve the problem” in one way or another. That year, in a case entitled *Philadelphia v. New Jersey*, the court voted seven to two that garbage was just like any other commodity, and as states did not have the right to cut themselves off from the flow of interstate commerce, they likewise could not cut themselves off from the interstate flow of garbage. The case

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\(^{50}\) Neil Seldman, "Mass Burn is Dying," *Environment* 31 no. 7 (September 1989): 43.


\(^{52}\) Ibid.
started in 1973, when the state of New Jersey tried to curtail “promiscuous dumping” in
the state by passing its Waste Control Act, banning other states from bringing their
municipal solid or industrial wastes to any of its 350 landfills. At that time New York
and Philadelphia were bringing 20,000 tons of garbage into the state per week with
seemingly little intention of finding other alternatives.\footnote{Special to the \textit{New York Times}, “Dumping Law Facing a Test,” 10 February 1974, ProQuest
abided by the act. Philadelphia, on the other hand, continued to see New Jersey as the
solution to its trash problems. The city’s Department of Streets Commissioner David
Damiano said, “There is no shortage of property in New Jersey. We could dump there
indefinitely.”\footnote{(No author), “Fight over Jersey Dumping Heats Up,” \textit{The American City and County}, August 1977, 42.} The Commissioner said that Philly just didn’t have room “in its own
backyard” anymore and that when the current dumping location twenty miles away filled
up in the next fifty years, they would move twenty miles further away.\footnote{Ibid.}

New Jersey seemed to be the proof for all the fears Americans had about being
consumed by their own waste, and the relatively small area known as the Meadowlands
were hosting between 30 and 40 percent of the state’s trash. Before the federal
government made states crack down on unregulated dumps, ten percent of the
Meadowlands’ 20,000 acres consisted of garbage heaps. It still had six authorized
landfills on 564 of its acres in the mid-1970s.\footnote{Commission on Geosciences, Environment, and Resources, “Restoration of Aquatic
“near the point of environmental destruction” and in danger of becoming a “mammoth
garbage dump.”57 The Environmental Protection Agency opposed New Jersey’s waste law, because it discouraged—they would say it made “impossible”—regional solutions to MSW issues.58 The Hackensack Meadows, for instance, are closer to Manhattan than many parts of the other New York City boroughs. To the EPA it made sense for areas that were close together to make mutually beneficial plans that would result in minimal transport of garbage. Additionally, the EPA believed that areas that were closer to each other should have had more needs in common than places that may just share a state name. Unfortunately, it seemed that New York and Pennsylvania were thinking about garbage regionally, but their regional solutions only intensified New Jersey’s local problems.

As developers began to see more and more potential in New Jersey land, especially the Meadowlands, New Jersey communities became willing to support legislation to close down the dumps, which in the past they had favored because waste disposal revenues provided one of their few outside sources of tax money. New Jersey was not the first state to try to ban out of state waste. In 1973, Delaware, Maine, and Rhode Island all had laws against importing garbage, but they did not have two of the most industrialized areas in the country relying on them for a disposal location.59 Philadelphia, Glen Cove, Long Island, and five of the private Jersey landfill owners in Southern New Jersey filed suit against the state and its Department of Environmental Protection. The landfill owners said the Waste Control Act “interfered with interstate commerce and created a hardship for them” and that they would face bankruptcy if the

57 “New Jersey’s Stormy Land Use Battle,” 94.
59 Kelly, Garbage, 93.
law were enacted. The law was supposed to go into effect on February 1, 1974, but a Superior Court Judge delayed it until March 25. In the Meadowlands four private landfills, operating under the somewhat misleading title of “Municipal Sanitary Landfill Authority,” filed suit against the Hackensack Meadowlands Development Commission for hurting their business. In both cases the courts found that the state’s law was unconstitutional, because it restricted interstate commerce.

These companies involved in the suits were not part of the emerging garbage mega-chains, like Browning-Ferris Industries (BFI) and Waste Management, Inc., which were sweeping the country in the early 1970s. Neither of those companies could have realistically claimed that the loss would lead them to bankruptcy. Additionally, the bigger companies were more interested in running legitimate and compliant corporate operations, something that many of the New Jersey trash companies could not claim. The dumpless cities were able to effectively argue their case to the lower court but not to the State Supreme Court, which in November of 1975 voted unanimously to uphold the state law. The higher court said that the law “advanced vital health and environmental objectives with no economic discrimination against, and with little burden upon, interstate commerce, and that the law was therefore permissible under the Commerce Clause of the Constitution.” The court stated that “there is nothing to indicate that adequate alternatives are not available in both New York and Pennsylvania. Philadelphia, on the other hand, claimed that without New Jersey’s landfills, it would have to “either let garbage pile up in the streets or use four incinerators that have been

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60 “Dumping Law Facing a Test,” 69.
61 Philadelphia v. New Jersey. (Section 1.).
closed because of air pollution." Other alternatives were of course available, but none were as affordable as the unregulated New Jersey market the cities and their businesses had enjoyed for so many years.

After the Resource Conservation and Recovery Act, which called for regional solutions to the garbage issue, was signed into law in 1976, the U.S. Supreme Court asked the New Jersey Supreme Court to reconsider their ruling. The following June the state court declared that it was sticking with its original decision and that “the Congressional enactment does not affect the Federal pre-emption either as to the disposal of hazardous waste or with respect to any other area of municipal solid-waste disposal.”

The communities in the Meadowlands had been able to pass community regulations that barred the New York garbage from being dumped in their landfills, but the Philadelphia garbage coming into southern New Jersey was so widespread that a single regional ban could not be passed without raising eyebrows about interstate commerce violations.

Philadelphia along with some of the New Jersey landfills, argued their case against the State of New Jersey in March 1978. The case called protectionism an “evil” and stated that no object of trade could be “excluded from the definition of ‘commerce.’” While New Jersey argued that quarantine laws allowed states to restrict items like contaminated rags, Philadelphia claimed that its garbage was no different than New Jersey’s and therefore should not be treated differently. In its June 1978 ruling on Philadelphia v. New Jersey, the court would side seven to two with Philadelphia, agreeing that the Waste Disposal Act violated the interstate commerce clause, and that

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New Jersey garbage was no different than the garbage produced in other places. The court said that the state could not invoke the exception to the commerce clause that would allow them to keep out hazardous materials, because the trash would have to gain risk just by being transported. States, the court said, were not independent economic units, and so they could not isolate themselves from the problems of or economic interactions with other states.66

Additionally, the court noted that a state is not allowed to horde its natural resources solely for the benefit of its residents, and it considered the landfill space to be a natural resource. The court accused New Jersey of trying to “saddle those outside the State with the entire burden of slowing the flow of refuse to New Jersey’s remaining landfill sites.” Justice Potter Stewart went on to say in his opinion that, “The Commerce Clause will protect New Jersey in the future, just as it protects her neighbors now, from efforts by one State to isolate itself in the stream of interstate commerce from a problem shared by all.”67 As long as garbage had somewhere else to go, it would protect exporting cities. This meant less pressure on politicians who had to deal with siting the new regulated landfills, called Subtitle D landfills because the rules for them were listed under Subtitle D of RCRA. If local officials could not find a politically acceptable place to locate a waste disposal site in or near their city limits, it was now officially acceptable to send it anywhere that had one. There was also no longer a need to spend millions of extra dollars, which cities increasingly did not have, to build a resource recovery plant when garbage could just be outsourced.

67 Ibid.
Commoner Rides Again

While Philadelphia, and soon New Jersey, would continue to export waste in the 1980s, New York City developed a plan to build eight WTE plants. The plan coincided with the move of the most famous recycling booster of the decade to the city. Barry Commoner had opened his Center for the Biology of Natural Systems (CBNS) in 1966. The center used a holistic framework to analyze the issues related to the environment, energy and resources. In 1980 Queens College offered to host and provide money to staff the center, so the scientist and his entourage moved to New York the following year, just as the city began to debate the safety of burning garbage. 68

Pollution concerns about resource recovery plants had existed since the early 1970s. The Union Electric, Monsanto and Ames plants all had to address pollution regulations in one way or another. These early fears usually dealt with sulfur dioxide, particulate matter, or bacteria. Testing on European-style mass burn incinerator emissions at the end of the decade, however, had revealed the most hazardous forms of dioxins, which were often made of things like plastics and chlorine. The plastics industry had boomed after World War II, as plastic began to be used in lieu of other material like paper, rubber and glass, and by 1985, the United States was consuming thirty-nine billion pounds of plastic a year. Unlike waste that was burned earlier in the century and often deemed a "nuisance," when plastic garbage burned it produced toxic chemicals including dioxins. 69 Although evidence was "inconclusive," problems believed to be associated

69 Barry Commoner, Making Peace with the Planet (New York: Pantheon Books, 1990), 110 (The dioxins were 2, 3, 7, 8-tetrachlorodibenzen-p-dioxin, or 2, 3, 7,8—TCDD); Carl A. Zimring, Cash for Your Trash: Scrap Recycling in America (New Brunswick, NJ: Rutgers University Press, 2006), 145; Melosi, Sanitary City, 398-399.
with dioxins included "increases in cancer, birth defects, psychological damage, liver
damage, cardiovascular deterioration, and degeneration of the endocrine system ...
disturbances in the responses of the peripheral nervous system ... severe weight loss and
chloracne, a disfiguring and persistent form of acne growth." The threat of dioxins was
debated, as was the threat of the other air pollutants, which many feared that resource
recovery plants were releasing, including lead, mercury, beryllium, nitrogen oxides,
polycyclic organic compounds, carbon monoxide and hydrogen chloride. As we have
seen, many of those in the waste industry did not agree that the concentrations released
carried such risks; however, when a chemical plant in Italy had an explosion that released
a "few pounds" of dioxin into the ambient air, leading to an area evacuation, to regular
citizens "the extraordinary toxicity of dioxin was widely appreciated, if still poorly
understood." When area residents complained about the bad smells from the resource recovery
plant in Hempstead, Long Island, the recent concern about the dioxin in European plants
caused officials to have the emissions tested. At the same time, the national media was
covering dioxins as veterans started to sue the government and the New Jersey Agent
Orange Commission started to investigate the famous Vietnam War herbicide, which also
contained dioxins. The Hempstead tests revealed "significant amounts" of dioxin in the
plant’s emissions. According to Commoner, “An intense controversy erupted, first
among technicians about the validity of the results, and later in the community about their

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70 Bloomberg and Gottlieb, War on Waste, 98.
71 Ibid., 100; Walter M. Shaub, "Disposing of Waste-to-Energy Facility Ash," from Waste-to-
Energy as a Part of Municipal Solid Waste management Volume 2: Selected Papers from the Proceedings
of SWANA/GRCDA Meetings 1987-1990 (SWANA Publication no. GR-WTE 0401, February, 1991) 98,
The city had contracted the plant, which cost $140 million, in late 1974 and it opened in 1979. It was a true 1970s style resource recovery process, comparable to the hydrapulper plant in Franklin, Ohio. It blended MSW until it turned into a kind of “watery slurry.” After recoverable resources like glass and metal were removed, the slurry was dewatered and turned into pellets that could be used in utility boilers. It could process 320,000 tons of waste per year and made enough energy to power itself and 20,000 nearby homes. The contract for the plant ran 17 years, but because of the dioxin concerns it only operated for one.\footnote{Commoner, \textit{Making Peace with the Planet}, 110.}

The controversy over the Hempstead plant gave citizens pause over the existent plans for the eight new WTE plants. The first was going to be built in the Brooklyn Naval Yard and was supposed to process 3,500 tons of waste per day. As with St. Louis residents, those living in the Naval Yard complained that the plant would cause an increase in truck traffic. The NY Department of Sanitation (DOS) then made plans for the garbage to be transported by barge. Once worries over dioxins broke out, however, the plant became set on a long course to derailment thanks in large part to the efforts of Commoner, who jumped into the issue soon after his move. In a scene that would seem familiar twenty years later in the middle of the country, a public relations battle over the plant ensued with the residents wanting to know how dangerous dioxins were and how much would be emitted, the Department of Sanitation arguing first that there was no risk of dioxins and later that the plant would burn the trash at such a high temperature that it

would eliminate any dioxins in the garbage, and the CNBS with a new batch of arguments. 74

Just as he had in St. Louis with his Committee for Nuclear Information (CNI), Commoner and his crew became involved in New York as scientific experts educating the community about complex scientific issues. The CNI was made up of citizens and scientists working for Washington University, while the CNBS at Queens College was made of tenured scientists paid by the university but working for Commoner and his center. CNBS attended public meetings about the WTE plants and provided test results from European plants that countered the DOS arguments. 75 “It became clear,” Commoner later wrote, “that the public acceptance of the proposed incinerator would stand or fall on the expected effect of the dioxin emissions on the people exposed to them.” 76 As he pointed out, these types of evaluations are particularly difficult because they involve so many different kinds of science: chemistry, physics, physiology, biochemistry and biology. The engineering firm that the DOS hired to measure the danger of dioxin levels found the risk to be an extra .13 deaths per million people. The EPA’s acceptable risk level was one extra death per million people. CNBS immediately attacked the study for assuming that the dioxins would be ingested by breathing, leading to a deceptively low risk level. The center conducted its own study and found the risk to be an extra 29 deaths per million, while an outside group estimated the risk would be 5.9 per million. Commoner was more interested in the difference between the second two estimates and the first than between CNBS and the third group’s, writing, “In any case,

74 Commoner, Making Peace with the Planet, 111.
75 Egan, Barry Commoner and the Science of Survival, 47, 48, 178.
76 Commoner, Making Peace, 111.
the original DOS assessment now appeared to be between 45 and 223 times too low.”

The debate continued in what Commoner called, “a kind of technological tennis match.”

The DOS first wrote its Environmental Impact Statement and left out mention of the
dioxins all together. Then the city hired its third consultant that based its calculations on
evidence the CNBS again found lacking. It focused on the impact dioxin would have on
soil, which there was very little of in the concrete-laden Brooklyn.

The most important assertion to come from the CNBS was that incineration
created dioxins. Dioxins did exist in products like plastics, as well as paper and PVC
pipes, which used chlorine in production. WTE promoters argued and Commoner agreed
that burning materials at certain temperatures could help eliminate dioxins. The problem,
Commoner argued, was that the process of incineration itself created new dioxins that did
not originally exist in the materials. He said that dioxins were an emergent property of
the process of incineration.

Some dioxin is present in trash because paper is frequently
contaminated with it as a result of chlorine bleach, which
is often used to process wood pulp. Dioxin in such paper
products is likely to be destroyed in the furnace if it is hot
enough. But more is synthesized in the incinerator, and as
a result, the trash-burning incinerator is a net producer of
dioxin—an unintended dioxin factory. Depending on the
efficiency of the control devices installed to precipitate fly
ash, some of the newly formed dioxin will emerge from the
stack into the air, while the remainder will be found in the
fly ash trapped in the control device. In one form or
another, the incinerator creates an environmental dioxin
problem.78

WTE plants, which Commoner referred to exclusively as “incinerators” or worse, were
another example, like nuclear power, of new technology creating new problems. Even if

77 Ibid. 113, 112.
78 Commoner, Making Peace with the Planet, 118.
plants got better at controlling emissions, the anti-WTE groups argued that the dioxins present in the remaining ash would be extra potent. Because the process “created dioxin,” it was inherently unsafe.\footnote{Barry Commoner, Making Peace with the Planet (New York: Pantheon Books, 1990), 119, 118; My discussions with resource recovery and WTE proponents has indicated that the term “incinerator” is a derisive one, as it does not incorporate the positive, or engineering aptitude that turns something unwanted into something wanted. Environmentalists often object to the terms “resource recovery” and “waste-to-energy,” seeing them as euphemisms for processes which entail the destruction and loss of resources and overall waste of energy; Richard Firstman, “High-Stake Risk on Incinerators,” in Rush to Burn: Solving America’s Garbage Crisis, ed. by Newsday (Washington, D.C., Island Press, 1989), 14.}

Plans for the plant were ultimately abandoned, and in the process of the debate Commoner came to be “viewed by the public as the major guru on dioxin.”\footnote{Edward J. Walsh, Rex Warland, D. Clayton Smith, Don’t Burn it Here: Grassroots Challenges to Trash Incinerators, (University Park, PA: Pennsylvania State University Press, 1997), 8.} Industry took a different line on the issue. In his 1993 book, In Defense of Garbage, Judd Alexander, the former Vice President of American Can Co., questioned Commoner and his claims. Alexander, poked at Commoner’s credentials writing that, “No less an authority than Commoner, called by his publisher (emphasis mine), ‘one of the world’s leading environmental scientists,’ has been in the forefront of resistance to WTE combustors.”\footnote{Judd H. Alexander, In Defense of Garbage (Westport, Conn.: Praeger, 1993), 1.} Alexander argued that the dose of any chemical was the most important factor in its toxicity. To illustrate what he considered the extremity of the EPA’s dioxin reduction requirements, which limited production to under ten parts per quadrillion, he converted the measurement to time, which equaled one second in 31.7 million years. By the time of his writing, the United States’ standards were 170 to 1,700 times stricter than Canada or many European countries.\footnote{Ibid., 161, 162.} He made more contentious statements about the risk of dioxins, stating that, “Other than a temporary rash, no one has ever become seriously ill from exposure to dioxin.” Using Commoner’s example of the chemical
explosion in Seveso, Italy, he said “there has been no increase in cancer or unusual incidents of birth defects among the affected civilians.”

In her work on science and environmentalism, political scientist Sylvia Noble Tesh stated that, “extrapolating (risks) from high to low doses, too, depends more on political judgment than on scientific data.” She discussed the case of Alsea, Oregon where the Forest Service sprayed the dioxin-containing herbicide 2,4,5-T on the property of unwilling landowners, who formed Citizens Against Toxic Sprays (CATS). CATS filed a lawsuit against the service for “filing an inadequate Environmental Impact Statement.” To prove their case, the members of CATS tracked every miscarriage in the community and found what appeared to be a high number during spray seasons. As a result of the CATS findings, the EPA banned 2,4,5-T in herbicides. Later, however, when Tesh called the EPA to ask about it, the scientist she spoke with told her that, “It was a politicized, goofy situation, a real emotional thing … It was probably a change for the better to restrict 2,4,5-T, but there’s no real proof that it causes miscarriages. It was done more for social reasons than for science.” Testing on animals, to the degree that was effective, which Tesh said it was not, had not scientifically proven the dangers of dioxins any better, as “all the data on humans suggest that people can tolerate considerably higher doses (than lab rats) before being harmed.” In their sociological study on grassroots opposition to incinerators, Edward Walsh, Rex Warland and Clayton Smith note the work of chemistry professor Paul Connett from St. Lawrence University, who worked with Commoner to stop the proliferation of incinerators in the 1980s.

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83 Ibid. 162
85 Ibid., 16, 14, 15
86 Ibid., 28
Connet asserted that the scientists that industry cited were "working for the industry," while, "most other scientists don’t know anything about it because they don’t have any incentive to study the issue … So our biggest problem is not being attacked by fellow scientists, but rather not having fellow scientists with enough time, energy, commitment or motivation to find out who the hell is right."  

While there may have been debate about the danger and extent of problems associated with dioxins, there is no debate that Commoner was right when he said that success or failure would depend on the public’s beliefs about their dangers. This was true for all plant sitings in the 1980s not just the New York incinerators. Until the dioxin issue had materialized, many people, even those involved in environmental issues, had not given too much consideration to the divide between the recyclers and the resource recovery proponents. As we saw in St. Louis and Ames, environmentalists had concerns about the unabated consumptive lifestyle that resource recovery allowed, but many preferred it to the alternative of continued landfilling. Of the eight WTE citing attempts that Walsh, Warland, and Smith’s studied, the second biggest difference between the three neighborhoods with successfully sited plants and those with defeated plants was the percentage of people who believed the plant was “bad for human health”: sixty percent of people at the defeated plants believed that, while only thirty-seven percent of people where the plants were sited did. The area with the largest difference was between those who believed their property values would decline: sixty-one percent of people where the plants were defeated believed this while just thirty-three percent of people where the plants were sited did. The property value issue, though, was localized, as we saw in St. Louis. It was the dioxin debate that turned the general tide against resource recovery.

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87 Walsh, *Don’t Burn it Here*, 23.
Paul Casowitz, the New York DOS deputy manager for solid waste planning and resource recovery, who planned the city’s eight incinerators, was shocked when the issue became so controversial. "I thought I was getting involved in a motherhood-and-apple-pie issue," he said. “It seemed to me that turning garbage into energy was something everybody had to support.”

The most famous dioxin protest of the decade was the Los Angeles City Energy Recover Plant (LANCER) project, which originally consisted of 43 WTE plants planned to take care of Los Angeles waste. The first plant was slated to be built in South-Central L.A., a poor area comprised mostly of African-Americans and Hispanics. In 1983, the city had hired a firm called Cerrell Associates to create a report advising the city of the areas that would be the most likely to resist an incinerator in their neighborhood. The findings said that it would be middle to upper middle class white neighborhoods that would be most likely to object. When the South-Central residents found out about the report—four years later—protests against the first plant, named LANCER I, began to gain ground.

In the meantime, the Ogden Corp. had won the contract to build the first plant in 1987 after an "aggressive and extraordinary lobbying [campaign], wining and dining and making hefty contributions to council members." The company planned to invest $28.3 million in the project and get its profits from the sale of energy. It also offered the neighborhood $10 million for a “community betterment fund,” something which offended the protesters. The projected risk of the plant was .118 extra deaths per million,

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90 Bloomberg and Gottlieb, *War on Waste*, 166;
well below the EPA’s one death per million standard and "the lowest cancer risk estimate at that time of any health risk assessment for a mass burn incineration plant" in the United States.\textsuperscript{91} The residents, however, did not accept the risk level. Technology was now available to make waste-to-energy plants even safer. Swedish emission standards were considered practically impeccable and the Japanese created computer systems that monitored pollutants and the functioning capacity of the equipment and reported that information to the regulatory agency.\textsuperscript{92} When conflicts arose about the plant’s emissions, Ogden refused to go beyond the standards it had agreed to meet. In their book on the LANCER project, Louis Bloomberg and Robert Gottlieb wrote that

> in an emotional interchange with a City Council member, an Ogden executive declared that his company would not be willing to guarantee meeting the Swedish guideline for dioxin ... Instead, Ogden was only willing to guarantee [the amount in] its initial draft contract with the city, a figure nearly 170 times greater than the Swedish guidelines.\textsuperscript{93}

As Congress did not pass the Clean Air Act until 1990, WTE plants existed in regulatory limbo for the entire decade. Even if they met all of the EPA standards for traditional pollutants, there were no standards set for dioxin emissions. When it was finally passed, the Clean Air Act would “put serious restrictions on existing incinerators," in the hopes that heightened emissions standards would improve plants that were already built or lead to the creation of new ones.\textsuperscript{94} In the interim, however, Ogden was probably proud of its plant’s comparatively lower emissions. To be asked to compete with Swedish incinerators, which would have been funded differently and likely would have had less

\textsuperscript{91} Bloomberg and Gottlieb, \textit{War on Waste}, 175; Commoner, \textit{Making Peace with the Planet}, 124

\textsuperscript{92} Bloomberg and Gottlieb, \textit{War on Waste}, 108.

\textsuperscript{93} Ibid., 178.

competition from other disposal processes, was too much for the company. The city decided to scrap the project in 1987. In her work on the rhetoric of the LANCER project, communications professor Jennifer Peeples said that three factors shaped the LANCER debate, none of which was the safety of the plant: the suspected method of location selection, the number of incinerators planned to be sited (with other communities knowing they could be next), and the identity of the opponents. This was not just based on race, she argued, but by the protesters decision to “orient themselves around being mothers and caretakers of children. By choosing to highlight protecting their children, opponents in Los Angeles preempted an opportunity for the proponents to make a moral stand.”

Turning waste into energy was a paltry benefit to achieve at the cost of children. In a new interpretation, Commoner later used the Cerrell report to argue against the notion of NIMBY-ism. Commoner said the report supported his assertion that it was not “antisocial selfishness” that made people oppose incinerators but the “dangers” that resulted from “government and industry’s failure to properly dispose of waste.”

The Union Electric transfer station in St. Louis, as well as the plants studied by Walsh, Warland, and Smith, prove the important role property values had in opinions about resource recovery and WTE projects, but the latter did also show significant worries about health issues.

**Mobro 4000: The Garbage Barge**

An event that happened the same year as the LANCER project certainly made it seem like the United States as a whole had a NIMBY mentality. The *Mobro 4000* barge left New York on March 22, carrying 3,100 tons of garbage, which it planned to deposit

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95 Peeples, “Trashing South Central,” 92, 91.
96 Commoner, *Making Peace with the Planet*, 122, 120-121.
in North Carolina. North Carolina officials became suspicious about the barge because of rumors that it was carrying medical wastes, and they refused to let it unload in the state. Officials in ports all the way to Belize also refused the barge. It finally returned home, where New York leaders would not allow it to dock for a time. The waste was eventually incinerated in October, seven months after it had begun its journey. Two years later, in a famous cover story about trash called "Buried Alive," Newsweek would report that,

the saga of Islip's wandering barge may have been to the trash crisis what the sinking of the Lusitania was to World War I ... Since then, 18 states and scores of municipalities have embarked on ambitious waste-reduction programs ... With amazing speed, recycling has shed its tie-died image, attracted big-business and political passion.97

The New Republic stated that, "as a dinner-table topic in Washington, garbage is up there with mobile missiles."98 Reminiscent of the situation in the late 1960s, stories like "How We Can Win the War against Garbage," "Tons and Tons of Trash and No Place to Put It," and "Garbage: It Isn't the Other Guy's Problem Anymore," inundated magazines.99 A kind of amnesia seemed to hit the media and WTE developers as they tried to put a new spin on the re-emerged "trash crisis." Fortune Magazine editors did not even bother thinking up a new title for its new story on waste: if "Where Will We Put All That Garbage?" was good enough for readers in 1967, it was good enough for readers in 1988. At least they changed the two-page picture in the beginning of the story from fires at the Kenilworth Dump, "Washington D.C.'s version of Hades," to seagulls attacking New York's Fresh Kills landfill, "in a nightmarish scene worthy of

Hitchcock.\textsuperscript{100} To David Pellow, \textit{Mobro} was more than a national talking point. Instead, it was proof that “the problem of environmental racism operates on an international scale.”\textsuperscript{101} Environmental racism, either within the United States or towards the Global South he said, was a kind of colonization. In the late 1990s, anthropologist Dennis Gaffin would add exporting trash from cities to rural areas to the types of colonization. These environmental inequities, Pellow said, were “not just stories of people of color versus whites, or of a single perpetrator and a single target; they are stories of the powerful versus the weak, of racism, and of resistance from below. These divisions are the core of what drives environmental racism, and they must be among the future targets of the movement for environmental justice.”\textsuperscript{102}

To the WTE industry, the \textit{Mobro} incident looked like a new chance to rebound. After the 1981 Reagan cuts and the dioxin scare, there was a brief period of optimism. Cities and engineers said they were going to scale-back their old goals. In a 1985 \textit{Fortune} article about WTE, journalist Colin Leinster waxed that the

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\textit{...the hopeful but realistic mood in companies eyeing such [WTE] contracts is a far cry from the naive euphoria of a decade ago. Worries that the industrial world might run out of raw material were rife at the time. Some corporate chiefs saw the nation's flotsam supplanting the end of the rainbow as the place to find a pot of gold-or, more prosaically, pots of metals, glass, paper, and especially, precious and untapped sources of energy such as gasses, steam, and solid fuels.}\textsuperscript{103}
\end{quote}

\textsuperscript{100} Tom Alexander, "Where Will We Put All That Garbage?" \textit{Fortune} 76, no. 5 (October 1967): 148,149; Faye Rice, "Where Will We Put All That Garbage?" \textit{Fortune} 117, no. 8 (April 11, 1988): 96, 97.


\textsuperscript{103} Colin Leinster, "The Sweet Smell of Profits from Trash," \textit{Fortune} 111, no. 7 (April 1, 1985): 151.
The old conservation fears were not as worrisome anymore, but trash still had to be disposed. The title of the article, "The Sweet Smell of Profits from Trash," and assertions that WTE plants "are about to take off as a major growth industry in the U.S., and capital investment in them over the next ten years could reach $20 billion," raise doubts that the "naive euphoria" was completely gone. The only real change was that developers were scaling back their projects and starting out with the European mass-burn technology, which only produced steam for electricity. In a different article, one resource recovery consultant said that the complexity of the equipment and the grand scales of the RDF facilities caused their downfall. According to the consultant, while they "were the 'phenoms' of the waste-disposal industry in the early 1970s ... the plants turned into monsters ... People just got carried away on the engineering side of things." The story did say that "RDF is not out of the picture." 105

The optimism was dampened just a year after the Forbes article when the industry suffered a major blow with the Tax Reform Act of 1986, which pushed cities nearly completely out of the WTE business. The act eliminated investment tax credits on industries and industrial development bonds that cities had used to pay for WTE plants. Without this city support, WTE plans were scrapped by the hundreds. The National Solid Waste Management Association said that taxing the bonds was "really mandating a return to landfilling through tax policy." 106 The dramatic hit to the industry can be seen in the decade’s WTE plans. Between 1982 and 1990, 248 WTE facilities were scrapped. Eight

104 Ibid.
106 "Refinements Bolster Trash Plants," 22.
of those were cancelled between 1982 and 1984, thirty-three in 1985, and 207 were
cancelled from 1986 to 1990. There were, in the end, a total of 140 WTE plants
operating in the U.S. in 1990, not nearly enough to recover the 1.84 quadrillion Btu a
year of energy that, in 1976, forecasters predicted resource recovery plants would
produce by the year 2000. The CEO of Ogden had said he was not worried about the
tax changes, because "Refuse is a threat to the environment ... These plants must be built,
and they will be financed as best they can be." He did not anticipate that ILSR and
Barry Commoner would ultimately see success when the rest of the country would finally
join them on the recycling bandwagon. With the growing popularity of recycling, even a
homeless garbage barge could not resuscitate WTE. Instead recycling would become
part of integrated waste management strategies which typically recycled some and
shipped or landfilled the rest.

Recycling goes Mainstream

The July 1992 issue of McCall's magazine had a presumably typical story about a
woman named Susan Wood. The story was about how environmentally minded citizens
were burnt out from the extra effort of recycling and because of disappointment that
market forces were not boosting the viability of recovering recycled goods. The story
opened with a discussion about the Pennsylvania single mother of two hauling her
separated goods to the curb every trash day, and then "to dispose of foam, cardboard and

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107 C. Heerman, Pyrolysis and Gasification of Waste: A Worldwide Technology and Business
(Westport, CN: Quorum Books 1994) 4; Melosi, Garbage in the Cities, 219; Melosi, Sanitary City, 409;
The United States consumed 98.96 quadrillion Btu in 2000, so the prediction would have been in line with
the 1970s estimates that resource recovery could meet about 2 percent of the United States's fuel needs.
Energy Information Administration, "World Primary Energy Consumption by Region, 1994-2003" (May-
paper, she makes two separate trips to different recycling facilities."\(^{109}\)
Nowhere in the story were Wood's multiple weekly trips characterized as wasteful or energy-consuming.
Instead, her concern for the environment was as rewarding as any results that might be attained from the action itself. The article addressed many concerns that people who were getting frustrated about recycling may have had, because "if people feel that the efforts of one lonely person (or one family, or one community) can't possibly compensate for the many businesses, communities and individuals that aren't working to improve the environment, they may lose hope." The article advised weary recyclers not to "give up the cause yet" and included a quotation from the deputy director of the Center for Policy Alternatives stating that "Recycling is the single most important environmental education tool we have."\(^{110}\) Recycling's success was based on how many people participated, demonstrably showing they care about the environment, as well as what percentage of garbage that was separated, rather than just by the outcomes from the efforts.\(^{111}\)

Many recyclers were inclined to believe that "some invisible hand separates and classifies the different types of recyclables ... and guides them, almost as good as new, back to the manufacturers who filled them before, thus presumably saving civilization great chunks of raw material and fabrication expense."\(^{112}\) The general public and politicians, who put recycling at the top of the "Waste Management Hierarchy," did not always consider the resources involved in source separation and the deconstruction and

\(^{109}\) Ellen Alcorn, "Recycling Fatigue: The Uphill Battle to Clean up the Planet," *McCall's* 119, no. 10 (July 1992): 98.

\(^{110}\) Ibid., 101.


\(^{112}\) Ibid.
reconstruction of recycled materials, or the fickle or absent markets for the products.\textsuperscript{113}

No matter what the outcome, environmentalists still found the act of recycling virtuous.

In his famous editorial against recycling, John Tierney said that,

> Recycling, which was originally justified as the only solution to a desperate national problem, has become a goal in itself—a goal so important that we must preserve the original problem. It's as if the protagonist of "Pilgrim’s Progress," upon being informed that he could drop his sinful burden right there on the road, insisted on clinging to it just so he could continue the pilgrimage to get rid of it.\textsuperscript{114}

The merits of Tierney’s editorial are still debated today. This desire to be virtuous only went so far, however, and the country’s consumerism was not curtailed. Recycling "did not spur customers to reuse old materials within the household but rather to make sure the materials would not enter the waste stream once they were evacuated."\textsuperscript{115} Furthermore, recycling became popular with businesses, not for virtuous reasons any more than their interest in resource recovery had been virtuous. This time recycling was popular because of its market appeal, as "finding the use of recycled materials in their products is becoming a marketing necessity, companies are becoming eager customers of the new

\textsuperscript{113} The solid waste management hierarchy lists waste reduction and disposal strategies for a community or the country in the most preferable order. Recycling and composting are generally at the top of the disposal methods of all hierarchies, followed by incineration (with Refuse Derived Fuels—this would be the most similar incineration to pyrolysis), incineration (with energy recovery from steam), incineration with no recovery, and finally landfills usually bottom out the list. Bloomberg and Gottlieb, *War on Waste*, 79. There is really no way to make a fair, overall judgment to determine if recycling is better than waste to energy. As Richard C. Porter writes in his book, *The Economics of Waste*, "It would be nice if we could do one definitive benefit-cost analysis of all the recycling in the United States and thereby decide, from an economic viewpoint at least, that it is a good or bad thing. But ... the benefits and costs of recycling vary greatly in different parts of the country and in different kinds of cities." (Richard C. Porter, *The Economics of Waste* (Washington, D.C.: Resources for the Future: 2002), 133. That does not even include the issue of fickle markets. Recycling, though, seemed to enjoy (and largely still does) an almost untouchable status in the minds of the public and consumers. It might have been seen as hippy or liberal, but rarely would anyone question whether it was worthwhile. Recycling has costs just like every other waste disposal method, and its economic worth is extremely variable depending on the situation just like every other waste disposal method.


\textsuperscript{115} Martin Melosi, *Sanitary City*, 137.
In the late 1980s detergent companies were advertising their new, recycled bottles, and major companies like DuPont and Proctor and Gamble were using recycled goods in a huge portion of their products and packaging. Companies had a market incentive to make the effort to switch to recycled products.

**Ames in the Recycling Decade**

Even though it had the only remaining resource recovery plant in the country, Ames citizens were interested in recycling, as well. In 1992, four years after the EPA had set a twenty-five percent recycling goal for the nation’s waste, Ames was considering whether or not to continue operating the resource recovery plant, which at the time was diverting sixty percent of Story County’s and eighty-two percent of Ames’s waste from a landfill. The plant’s supporters compared their opinions about recycling to the most controversial issue of that election year. In an *Ames Daily Tribune* story entitled “Burning Offers Alternative to Recycling,” then Plant Superintendent Kenny Moravetz said that Ames was “pro-choice” when it came to garbage. It was up to Ames residents whether they wanted to sort materials for recycling or just chuck it all. Moravetz said that, “In most communities, you don’t have that choice … We want residents to not feel guilty when they throw something away.” At least a few Ames environmentalists were unsatisfied with the limited materials extracted and with Moravetz’s “pro-choice” statement. Ames resident Nancy Treu, a registered dietician, wrote a guest opinion into the *Tribune* calling the idea “absurd.” “It has been and is our selfish and wasteful

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117 Ibid.
overconsumption of resources that has gotten us into this problem in the first place,” she wrote. “We SHOULD feel some guilt anytime we use up a resource, especially a non-renewable one.”

The national concern over dioxins also affected the local population. “I shudder every time I put a number six or seven plastic container in my trash,” Peggy Murdock wrote the Tribune. “I know we don’t recycle this grade of plastic because it is too hazardous for the people working in the plants that do that. Can it be any healthier for us to burn it six blocks from my home?” Unlike many of her fellow Americans who had limited access to local authorities, however, Murdock reversed her position after Merlin Hove, the municipal electric system director, contacted her and explained that the plant burned the material at safe temperatures. Still her letter showed that fears about air pollution were gaining ground on the farmland conservation issue, which city officials had continued to use as justification for the plant, especially as the plant had yet to show any promise of ever turning a profit. At a community forum to discuss the MSW disposal plans, some residents called the city “ignorant” for using the “incinerator.” Paul Wiegand, director of public works in the early 1990s, called the plant a “17-year experiment,” and said that when Ames developed a new solid waste plan, recycling would probably be “the number one thing.”

The day after Wiegand’s statement appeared in the paper, R.W. Beck and Associates, the consultants the city hired to help create its next 20-year solid waste plan,

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120 Nancy Treu, “Guest Opinion: Let’s Discard Throwaway Society—Incinerating garbage is not a viable alternative,” Ames Daily Tribune, 1 October 1992, 6A.
appeared at the city council meeting to recommend the city keep the plant but adopt a more integrated waste management system that included some type of recycling. When the city council finally held a community forum to decide the plan, all of the debating focused on the resource recovery plant instead of recycling. Ultimately, recycling legislation would not happen in Ames. Resource recovery and WTE plants operating before 1989 did not have to adhere to the EPA’s new recycling law, and the city council decided against the shift on the basis of market demand. In the vein of the 1970s resource recovery discussions over the most efficient resource use, the council decided that paper and plastics, which made up twenty-seven percent of the waste stream, were more valuable as fuel for the power plant than as recyclables. Additionally, there would be no increased revenue from metals, because the current system already separated them.  

“Council members agreed that there was no point in subsidizing a recycling program when the city pays for the resource recovery plant.”  

The city’s commitment to the plant and its conservationist mentality could be seen in this decision: The plant had continued to run despite significantly lower than expected profits with the rationale that it was an environmentally benevolent operation, but the city decided the environmental benevolence promised by a recycling operation was ultimately not worth the expense. Additionally, farmland had seemed to be a severely threatened—not to mention very local—resource, and for that the city was willing to sacrifice. Glutted paper markets proved that there was no shortage of paper, which was available anywhere, so in that case market practicalities took the forefront.

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Even if the community did not change its method, it would change its angle. The resource recovery plant adopted a public relations campaign that by the middle of the decade had it realigned with recycling. A subtitle on a Daily Tribune story called, “Talkin’ Trash: Ames Sets the Pace,” read “Recycling is a household word here.” The first sentence of the story said, “As the recycling rage sweeps the nation, Mid-Iowans can smile to themselves in the knowledge that they were ahead of their time.” The story immediately shifted to resource recovery issues. The reporter saw the issue as a no-brainer, writing, “Lest environmental purists begin shouting that burning garbage cannot possibly be good for the environment...consider that the trash provides enough energy to heat more than 4,600 homes each year.”

Ames residents invested over $6.5 million in the plant in 1995 and 1996. The renovation money went toward replacing worn equipment, adding new technologies, and building a shredder room outside of the main building, to avoid future incidents like the propane tank fire of 1987. The city’s consultants also anticipated that the power plant would need major renovations once new EPA guidelines were established. Starting in 1996, the city began counting the per capita fee as revenue, allowing the plant to operate in the black for the first time in 1998.

The city’s commitment to resource recovery was truly an anomaly, but while the Ames solution was highly technical, it shared some of the qualities that made recycling popular. Both its small-scale and the fact that it was municipally owned made it seem

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127 Ibid.
more “democratic,” like recycling. What Melosi wrote about recycling was also true of the Ames plant:

At the very least, implementing recycling programs put municipal policymakers on the side of conservation of resources and gave concerned citizens a way to participate in confronting the solid waste dilemma in specific, and environmental problems in general. The perception of recycling as an answer to the nation’s disposal problems gave it strong momentum in the 1980s.\textsuperscript{129}

While the different interests between resource recovery and recycling were once seen as complimentary, at least for some parties, in the early 1990s, the rest of the country besides Ames was almost exclusively focused on recycling. Twenty-four states had materials recovery facilities (MRF), which turned recycled goods into usable products, and half of the citizens in the United States were part of a curbside recycling program. In the last part of the 1990s, the EPA raised its twenty-five percent recycling diversion goal, which it had originally thought was a pie-in-the-sky figure, to thirty-five percent.\textsuperscript{130}

With the help of recycling, many cities were able to postpone looking for long-term local solutions. Existing, operable landfills had their lives extended and municipalities without landfills could send their garbage to another site, even if that is in another state. In 1995, all states were either importing or exporting trash, and by 2000, 32 million tons of trash were going to different states. Where they existed in the 1990s, WTE facilities, for the most part, took their place in cities as part of integrated solid waste management programs. These new plants were designated to recover a certain kind or amount of trash in a much smaller plant than those in the 1970s with a specific

\textsuperscript{129} Ib\textsc{id.}, 223.
\textsuperscript{130} Melosi, \textit{Garbage in the Cities}, 221, 222.
market in mind before they were built. As it turned out, this restructuring and the surprising heights attained by the recycling movement would eliminate resource recovery as an "absolute requisite for an orderly transition through the 1980s and into the 21st century." The movement would basically have to rise from the ashes, if it were to once again come close to its former prominence.

**Mr. Commoner Goes to Ames**

The Ames plant’s new profit-making status at the end of one century would not keep it from its greatest controversy at the beginning of the next. In 2001, Barry Commoner and his CNBS conducted a study on dioxins for the North American Commission for Environmental Cooperation (NACEC). Commoner’s group studied causes of cancer among the Inuit Indians, who live in Canada’s Nunavut territory in the Arctic Circle. Although they were far removed from most industry, the Nunavut Inuits had an average of five to ten times the amount of dioxins in their bodies as U.S. or other Canadian citizens. Using a computer-generated model, the study determined that there were about 44,000 sources of dioxin emissions in Mexico, the U.S. and Canada, and that among those 44,000, the Arnold O. Chantland Resource Recovery Plant in Ames, was the very worst polluter, causing the most dioxins to move north and get trapped in the Arctic Circle due to wind current patterns and the cold weather. Dioxins do not usually reach the Arctic by air, but instead they get into water systems, where fish eat contaminated algae. The fish are ultimately consumed by animals with a high-body fat content where dioxins can accumulate, like the seals that the Inuit rely upon for subsistence.

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131 Ibid., 215.
Another technological tennis match ensued. The last time that the Ames plant’s stack emissions had been tested was in 1981. Although the test had come back negative for emissions, Iowa State University professor of energy Robert Brown said that result was based on old technology and that any new test was certain to come back positive. At the time of Commoner’s criticism, the EPA did not have any standards for an RDF plant like the Ames one, so any determination about how many dioxins would be too much would have to be decided by a lay city council. Brown said that was a game that the council did not want to get into because it would be highly unlikely that the city would be able to satisfy the critics no matter how much money they spent. The city was going to ask the Kansas City firm Midwest Research Institute to test their equipment, a process expected to cost about $80,000. Brown, however, offered to do a study costing just $5,000. The local scientist said the problem with paying for a more extensive test for the plant’s furnace and cooler, was that even if the results were acceptable, Commoner could say that the dioxins must be coming from somewhere else in the facility.134

Commoner and his crew said that the dioxins were also a local danger, not just something that was affecting people in the nether regions of Canada. The danger, he said, was that the dioxins got into food supplies and would build up in consumers of the food. Any livestock being raised anywhere close to Ames—specifically Wisconsin dairy cows—would carry on contaminants to the consumer. Mark Cohen, the scientist who

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Johansen, “The Inuit’s Struggle with Dioxins and Other Organic Pollutants,” *American Indian Quarterly* 26 no. 3 (Summer, 2002), 480.

developed the computer model for the NACEC, said that within two weeks dioxins could travel in numerous different directions, ‘leaving North America ‘awash in it.’”

Commoner’s two solutions were to either speed up the cooling-off phase, so there would be less time for the dioxins to form, or to ban “incinerators.” The plant’s long-standing argument had been that dioxins could not form in the 2,800 degree temperatures in which it burned its garbage. This did not counter Commoner’s argument had been that the incineration process might eliminate dioxins in the materials, but created new ones in the process.

Even before he began his study, Brown accepted Commoner’s counter to the plant’s argument: that dioxins could form in higher temperatures or at least in the cooling-off phases of recovery. He did not accept much else. In his report, Brown, who was director for ISU’s Center for Sustainable Environmental Technologies, called Commoner’s conclusions “grossly inaccurate.” Commoner had claimed that the Ames plant was producing 58 grams of dioxins a year, while Brown said that number was 400 times too high. Commoner’s lumping of the plant with “incinerators” particularly irked Brown, as the resource recovery facility was a pulverized coal boiler. Only ten percent of the burned material was garbage, and most metals were taken out before burning. Additionally, plant proponents still believed that co-firing with coal helped to remove toxins. He said that Commoner “found the worst type of combuster and used it [as the

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136 Lawless, “Pollution Researcher Defends Dioxin Study.”
model] for Ames … it was the absolute worst … It in no way represents the facility in Ames.”

The exchange between the two scientists involved not only different ideas about methods but starkly different ideologies. Brown said that Commoner was advocating rather than doing science. Commoner, for his part did not believe the two actions were mutually exclusive. Historian Michael Egan has traced Commoner’s entwined relationship of activism and science. Commoner believed that scientists had a social responsibility that was more important than the pursuit of more science for its own sake. He had been opposed to resource recovery projects for nearly thirty years, viewing them as another example of technological overkill with inadequate knowledge of consequences. Brown, however, believed his activist platform caused Commoner to create bad scientific analysis and accused him of having in mind a number he wanted to get to and working backwards to find a solution. Additionally, Commoner had never studied the Ames plant in person but instead tried to figure out how much pollution the plant produced based on the type of equipment and the amount of waste the facility’s staff had said was being processed. This, Brown said, was “calculating on the basis of assumptions.” Brown also pointed out that the only peer review that Commoner had for his findings was the CNBS. Commoner responded that his staff gave the paper, “far more scrutiny than any peer-reviewed paper would normally get” and called Brown’s conclusions “distorted,” “puerile,” “unethical,” and “foolishness.” He said that Brown

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139 Grebe, “Commoner Says Brown Dioxin Report is Puerile.”
“did his job” by saving the city most of the $80,000 an environmental test would have cost them.\textsuperscript{140}

Sociologists Michael S. Carolan and Michael M. Bell have since studied the issue and determined that

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The Brown report, like the Commoner report, relied on theories of what is going on in the plant, not direct evidence, and it ignored the direct evidence that dioxin from somewhere is getting to Nunavut. There was substantial uncertainty on both sides—from both incomplete and inaccurate knowledge. And yet, the Brown report argued not only that enough was already known, but something even stronger—that more information would be harmful to the process.\textsuperscript{141}
\end{quote}

The authors then proposed that both scientists and the local community failed for not asking the Inuit for their input.\textsuperscript{142} Silvia Noble Tesh said this type of suggestion belonged to the category of identity politics activism. The belief is similar to Rachel Carson’s call to “see and feel” nature. If something dangerous is in an area, identity politics activists believe the people of the area are often the first one to notice that something is awry. “To grassroots activists the insight about pollution that seems to spring from their daily existence is much like the knowledge African-Americans have about the existence of racism or the cognizance gays have about homophobia,” Tesh wrote. “Like people struggling for social equality, toxics activists are indignant when policy makers act as though their situation has to be uncovered and certified by professional experts. To those experiencing life with pollution, nothing about it is

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\textsuperscript{140} Ibid.
\textsuperscript{142} Ibid., 289.
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obscure.”¹⁴³ There are some serious problems with using this type of method in the Ames situation. Carolan and Bell’s solution presupposes that the Ames plant is an important contributor to the dioxins in the Arctic, something it felt was never adequately proven. Moreover, unlike in other cases of identity politics activism where the pollution source is more obvious, the Ames plant is one of 44,000 possible sources of emissions. How would the Inuit know that Ames emissions were as culpable as Commoner suggested? Additionally, just because Brown believes it is futile to try to answer Commoner’s claims, that does not mean he believes no more environmental knowledge is necessary. Commoner’s efforts in New York, after all, had resulted in the abandonment of New York’s incineration plans not merely on improving techniques. The Ames plant has consistently met the requirements of the EPA both in its initial testing and over time. In 1994, when EPA required that municipal waste combustor ash be tested for hazardous materials, Ames spent $50,000 on the testing. Like Ogden, Ames did not want to have to pay extra to meet ideals that did not exist in the law.

Carolan and Bell’s analysis might be correct, however, that the city has used Brown’s conclusions to establish complacency about the issue. Plant officials continue to work towards the best operating systems and to promote other environmental benefits of the plant, such as reduced greenhouse gas emissions compared to a landfill, but Brown’s report has provided their final word on dioxin concerns.¹⁴⁴ There was no real surge of local activism after the debate. One reporter said that he remembered seeing Barry Commoner on the St. Louis Walk of Fame and suggested that Ames should build its own Walk of Fame and “include Commoner, if only because he’s really given [the city]—not

to mention me—some interesting work to do." Carolan and Bell wrote about the underground opposition of the Ames Quality of Life Network, but the group apparently tried very little to affect the council’s decision. A couple of months after the debate a columnist from the newspaper in nearby Nevada, Iowa, was lamenting the lack of a conservation ethic in her community. “I know [Nevada’s] trash goes over to the Resource Recovery Center in Ames to generate energy,” she wrote, “but I’m worried about the talk of dioxins at the plant. I recently read that babies get their lifetime supply of dioxins from six months of breast feeding.” While the columnist expressed a sincere concern, her words hardly sounded like they were coming from a community with highly-mobilized protestors. Melosi has suggested that the front-end of the waste stream needs to receive a more critical eye. There is always going to be garbage, and it will have to be disposed of in one way or another. Increasingly, cities are causing transportation pollution and serious environmental justice questions by sending their waste to poorer, usually rural towns and counties, that are so desperate for money they are willing to fill their towns with other people’s garbage. If the material people disposed of was more environmentally benevolent, dioxin concerns would not be such a problem.

In 2004, consultants suggested that the city close down both the power and the resource recovery plants. Renovation costs for the power plant alone were estimated to

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146 Carolan and Bell, “No Fence Can Stop It,” 286-287.
148 Martin Melosi, Garbage in the Cities: Refuse, Reform and the Environment, (Pitts, PA: University of Pittsburgh Press, 2005), 207, 215
be up to $157 million.\textsuperscript{149} The plant survived again, however, as city officials for the time being have decided to pay for improvements as necessary rather than abandoning the facilities. Just like its old mascot, Reggie the recycling cat, the Arnold O. Chantland Resource Recovery Plant in Ames appears to have at least five lives. Throughout its 34 years, it has served as a solid waste disposal solution, farm land protector, energy supplier, a way to recycle without having to recycle, and, in its most recent incarnation, a “smart” way to handle trash.\textsuperscript{150} While the city may be accused of taking Robert Brown’s report too much to heart and painting too innocuous of a picture of resource recovery, it is not easy for an alternative energy based on an environmental ideal to last for three and a half decades. If more promising solutions from the seventies would have survived as long, they, too, undoubtedly would have faced criticisms along the way. Ames is the only city to succeed at what other cities across the country set out to do in the 1970s. No one else had the same patience or willingness to take constant financial losses for an environmental good. They created a local energy source, protected what appeared to be a rapidly diminishing natural resource, and employed local ingenuity to solve the universal environmental problem of solid waste disposal, achieving many of the goals of their supposed ideological opponents in the pro-recycling camp.

\textsuperscript{150} As part of the city’s “Smart Energy” campaign (new in 2009), the resource recovery operation has been dubbed “Smart Trash”
Conclusion

If we could put ourselves in a time machine we could fly over the towns and cities of the world fifty, a hundred, or a thousand years from now…. What would we see? Would it be a civilization buried in waste, choking in pollution, and standing in line for jobs and energy rations? Or would it be a happy, healthy, and prosperous civilization that had trimmed its waste and saved itself? Will the generations to which we turn over the keys to our planet follow our wasteful ways or our waste-trimming ways?¹

Arthur Purcell, an environmental engineer, who studied peace and resources, asked these questions in his 1980 book *The Waste Watchers*. Purcell studied the relationship between resources and peace and believed in using a mix of methods to address the nation’s waste that included low and possibly even high-technology solutions. As with most Americans, though, he believed the number one priority was conservation. If the United States could learn how to become a “low-waste society,” he wrote, it wouldn’t “have to be a 1984-like world. We won’t have to be living on electronically produced vitamin capsules in underground bunkers.” Instead, Purcell thought a world with less waste would be utopian-like, the ills of pollution and inequity eliminated.²

Although Purcell was not necessarily against resource recovery, the binary options he presented—use less resources and be “happy, healthy and prosperous,” or use more and risk being “buried in waste, choking on pollution,”—are really at the heart of resource recovery’s downfall. Over the last fifty years, America’s view of the promise of waste and resources went from Jane Jetson casually crumbling her morning coffee cup into a hole in their kitchen cabinet that sent trash “away” in 1962; to Elroy Jetson chasing his beloved dog Astro down a garbage chute at a fancy resort, only to find a world of old

² Ibid., 209.
and forgotten junk below where garbage was still completely separated from humans but the neat old stuff was worth waxing upon in 1985; to Wall-E’s paved over, garbage-filled, nearly lifeless earth, and a modern but rather limiting space colony in 2008. The pre-Silent Spring idyllic life showcased in the early Jetsons embodied John Maynard Keynes’ ideas of a future based in leisure and material wealth. As environmental awareness spread, so did the belief that the good life could not come without some cost, somewhere. Elroy’s trek through the garbage “Wonderland” might be seen as a broader acceptance of Barry Commoner’s “law” that there was no such thing as a free lunch. If one place could be healthy, beautiful and trash-free, then it must be at the expense of a second place that had to be polluted, ugly and full of trash. The old tools and appliances down in the netherworld of waste that required some degree of know-how and skill could have been a nod of the hat to the appropriate technology movement, led by many groups, including the Institute of Local Self-Reliance. Wall-E’s situation is the most extreme, but at the same time the belief that there will be dire consequences if humans do not act as active stewards of the environment is a commonly held view in the 21st century, thanks in large part to the recycling movement’s efforts to stress the importance of the individual in caring for nature.

Where does resource recovery fit into these changes? The national resource recovery effort started after Americans had lost their environmental innocence but before their faith in technology started to slip. They had reached the moon and, to many, like Joe Lynch who wrote President Carter (Chapter 3), that meant Americans could solve

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“other great feats of endeavor.” Additionally, it was not just a technology that produced a product or created energy, it dealt with a serious environmental problem. Trash seemed to be everywhere in the mid-1960s. Burning waste polluted the air, and it would become increasingly clear that even sanitary landfills were contaminating groundwater. Opponents could complain that resource recovery plants were a band-aid to the nation’s affluent way of life, which sooner or later would have to be addressed, but the fact is in the over forty years since the St. Louis first received federal funding for its refuse derived fuel plant, Americans are still consuming plenty.

A study by the U.S. Bureau of Labor Statistics found that young adult spending decreased only about $1,000 in real dollars between 1984-85 and 2004-05. Nearly ten percent more was spent on homes and apartments, while apparel and services consumption did drop by nearly nine percent. However, another study by the Bureau, examining “real change in apparel expenditures from 1984 to 2008,” showed that 2003, a year before the other study, was one of the lowest points in consumer apparel spending and that by 2008, consumption of men’s apparel for all ages was up five percent from 1984, while women’s apparel had climbed twenty-five percent in the same amount of time. While rates could fluctuate a great deal between years and consumer patterns could be interpreted in a variety of ways, the important point is that people were spending almost as much on consumption in 1984, just slightly before recycling became popular, as in the first decade of the 21st century. While environmentalists can claim that more

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4 Letter from Joe D. Lynch (Phoenix City, AL) to “Sir” (James D. Schlesinger), James Schlesinger, Box, 11, Energy Suggestions Correspondents 19 Citizen
Americans have an environmental mindset than ever before, it is less clear what that means in tangible results.

Much of the strong opposition to resource recovery by the Institute of Local Self-Reliance and other pro-recycling groups was based on the argument that resource recovery did nothing to curb the real issues of production and consumption. Can it be said that recycling has done any better in curbing those areas? The statistics from the Bureau of Labor, along with the proliferation of mega-chain retail stores and the product variety that appears in them, even if it comes from a handful of mega-corporations, belie the idea that America’s greener consciousness has changed its interest in purchasing. The items Americans now buy might be more environmentally sound, but that is what those who had a faith in markets and technology said would happen. If new environmental needs arose, they could be met with new technologies.

There has been a popular push in the 21st century to “buy local.” This might be attributable to the decentralized thinking that recycling promoted, as the ILSR had hoped. Individuals who did their part for the environment by carefully accounting for all of their containers became more thoughtful about the production process and that translated into more thoughtful consumption. But it should be noted that even “buying local” is a type of consumption. It might or might not be a trend, but it does not disprove that Americans still like to consume. Organic crops are as much a product of business as genetically modified organisms. Small businesses may be immune to some of the problems that people like Neil Seldman argued existed in centralized powers, which he said were undemocratic and led to a loss of vision, imagination and self. But as the Ames project points out, resource recovery projects did not have to be on a mammoth scale.
Concerns over dioxins and other health issues were important, of course. But pro-recyclers were generally not pushing for the European-type source separation that could make mass-burning safer. Their call to abandon resource recovery created new environmental problems the same way Barry Commoner claimed that new technology would. In 2000, the Solid Waste Association of North America released a study reporting that states exported over 31 million tons of garbage that year, three times the amount of garbage that had been transferred eleven years earlier. About 84% of the waste transferring happened between neighboring states, but that still often meant that less populated rural areas were bearing the brunt of urban wastes at the expense of their land and often endangering their water supplies. Sometimes these deals were lucrative for the rural areas, and increasingly they are so, but for many years that was not the case. At the beginning of the 21st century, Meno, Oklahoma, was taking the trash from Wichita, Kansas, with an agreement that promised the town a mere 25 cents a ton for time immemorial. In the 1990s, a New Jersey outfit tried to make a deal with an individual for some of their state’s trash in McPherson, Kansas, without offering any compensation to the town at all. Bill Clinton’s Executive Order 12898 protected areas with large numbers of poor or minorities from having an unfair portion of environmental burdens. Rural areas, however, have received no such protection thus far.6

Commoner criticized the resource recovery plant in Ames, Iowa, but Ames has never sent a barge of its waste to South America or filled a train with its trash and sent it halfway across the country. If recycling did not bring the change in priorities that its proponents had aimed for then their inherent resistance to technology ought to be

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6 Jean Hays, "Trash Irks Oklahoma Residents, Too—Like Many Places, the State's Residents Don't Want Wichita's Garbage but Say There is Little They Can Do to Block It," *Wichita Eagle*, 7 October 2001, 6A, accessed from NewsBank.
reexamined as well. In Commoner and the Center for the Biology of Natural System’s study on dioxin emissions, they identified twenty-three main sources of emissions, many of which represented no technological advances since the early 20th century or even the caveman days. One of the largest sources of dioxins in the United States, Canada and Mexico was the backyard burning of wastes. In total it was the largest emitter of dioxins because of Mexico’s lack of municipal solid waste (MSW) incinerators. Medical waste incineration barely trailed behind MSW in the United States and was significant in Canada as well. The third biggest emitters in the United States and the second in Mexico were cement kilns.7 The technological stage of some of these emitters can beg the question of whether the danger is too much technology or of stalled technology, which at least in part can be attributed to the growing fears of risks, promulgated by Barry Commoner and others who share his ideology.

The downfall of resource recovery cannot just be tied to the growing power of the recycling and anti-technology movements. When resource recovery switched its focus to waste-to-energy, it lost much of its conservationist cachet. As people became increasingly concerned about the environment, it was easier to see the environmental good in, and therefore support, the idea of saving resources. Making new energy was politically popular in its own right, but it was not an answer to environmental threats. The Sierra Club supported resource recovery, but it did not support Jimmy Carter’s synfuel plan. It should be expected that the movement would lose clout when it became one more way to make synfuels. Additionally, the support of recyclers who were willing

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to work within a system of market demand was lost when resource recovery switched to waste-to-energy and abandoned the old, shared interests of efficiency and economics.

With the technological suspicion that began sweeping the country at the end of the 1970s, Ronald Reagan’s cuts to city governments put the final nail in the resource recovery coffin. As the Baltimore official said after the Monsanto pyrolysis plant fiasco, “A city can’t afford to take risks.” (Chapter Two) The new WTE plants might have been less technologically risky, but they did not have much of a chance to build up a track record before the federal cuts, and they still cost money, which local governments no longer had. That might not have been the final nail and the cuts might not have been insurmountable, though, if it were not for the dioxins scare of the 1980s and beyond. The new Subtitle D landfills that the EPA required in order to meet RCRA standards were also extremely expensive. Many cities started to slough off their waste management responsibilities onto the large garbage chains, which could afford to invest in the expensive new equipment. Even without resource recovery, environmental protection led to centralized solutions. Those large companies could have invested in WTE plants as easily as landfills if there had not been the fear of dioxins and the uncertainty of future governmental pollution standards in regard to those carcinogens.

While I question the impact that recycling had on changing consumer behavior, Silvia Noble Tesh has argued that environmentalists as a whole have changed the way that society considers evidence about technological risk. Tesh does not argue that this change is bad, saying that “it is possible to construe hegemonic ideas positively and to inquire into their sources, not in order to free people from disguised oppressors but to
better understand progressive social change.”⁸ While Barry Commoner and Rachel Carson were once on the outside of the scientific community and had to defend themselves against critics inside and outside of that group, their views have now gained what Tesh calls “reverse hegemony.”⁹ Even though both scientists have become famous because of their activism and their ability to communicate rather than because of their scientific work, their warnings have become the ruling authority that must be kowtowed to.

In the process of this reversal, the pro-recycling, anti-industrialists have become the new center. Under their reign it is accepted that there is something inherently wrong with Jane Jetson’s disposable coffee mug and out of sight out of mind waste handling attitude. One has to accept that quotidian practices that encourage conscientiousness are better than a world where such rituals are not required and more to the point, they must believe, like Arthur Purcell, that such a world is not possible and individual carelessness about waste will only lead to dire consequences. John Maynard Keynes believed that humans would find a new path to forge in life after they had been untied from their mundane responsibilities, and the traditional American faith in technology and the cultural affinity towards science fiction indicate that this prospect was exciting to many. Resource recovery was the futuristic way to handle garbage and resources. Humans would not have to waste their time messing with muck, but instead could direct their attention to any noble pursuit they desired, resting assured that experts who knew the best way to maximize the utility of resources would ensure their security. Because the process acknowledged the worth of materials in different ways and could incorporate

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⁹ Ibid.
elements like recycling, it was an idea that for a very short time at least inspired cooperation. Partially because of its own shortcomings that included technological failure and a push too far towards a single material interest (energy), partially because of outside factors like budget cuts, and partially because of a shift in national priorities that included the promotion of risk assessment as a central indicator of the goodness or badness of a particular project, the short-lived experiment of resource recovery would fail. Any hopes of a resource-based utopia would vanish with it, being replaced with the more down-to-earth frugality that emphasized limits rather than possibilities and danger over glory.
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