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*The U.S. Paper Industry and Sustainable Production: An Argument
for Restructuring*

Maureen Smith, 1997

The U.S. Paper Industry and Sustainable Production

An Argument for Restructuring

Maureen Smith

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*In memory of my father
Tremaine Francis Smith*

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Series Foreword

Robert Gottlieb

During the past several decades, environmental discourse has significantly broadened to include perspectives that connect our understanding of human and natural environments. Environmental questions are increasingly seen as embedded in issues of technology, landscape, and social organization. Critical investigations of these questions have begun to be located in various arenas of interdisciplinary research that bring together the insights of such fields as industrial ecology, urban studies, industrial geography, urban environmental history, regional planning, and occupational and environmental health sciences. New ways of looking at public policy parallel these changes in environmental research and teaching within the university. The new approaches emphasize environmental justice, toxics use reduction, place-centered environmental management, and pollution prevention. Community and industry initiatives in such areas as land use, produce design and procurement, and resource management have also contributed new insights about urban and industrial environmental change. Urban and Industrial Environments, a new book series from The MIT Press, has been created to advance these concepts of urban and industrial environmental analysis. Books in this series are being drawn from the wide range of disciplines that address the environment in the context of daily life experiences and the evolving structures of industrial activity and urban form. The series offers views of the complex and contested arena of environmental policymaking, the role of social movements and interest groups in the formation of policy and changes in institutions, and the evolution of industry sectors.

Acknowledgments

This book developed out of a project I began during my studies at the UCLA Graduate School of Architecture and Urban Planning in the late 1980s. The topic was sparked by a suggestion made by Robert Gottlieb, and the ensuing effort would not have been completed without his support and encouragement. I am deeply indebted for his help and his unwavering optimism; but most of all, I am inspired by the wonderful example he sets in his own work. In addition to Robert Gottlieb, Stephanie Pincetl provided thoughtful comments on several early drafts of the manuscript as well as strong encouragement to complete it. I also benefited at different stages in the process from comments provided by Louis Blumberg, Norm Masters, Michael Picker, Peter Sinsheimer, Al Wong, and some six anonymous reviewers. I am particularly grateful to Norm Masters for the many hours he spent on the phone with me discussing the MacMillan Bloedel project in West Sacramento, and for inviting me to be involved in his community.

My access to various individuals and forums benefited in important ways from the support of Randy Hayes, Susan Bluestone, and Adam Davis. The many interesting conversations I had that flowed from public presentations of parts of the manuscript and from my work with environmental groups in California were integral to the development of several chapters. In addition, the excellent research papers and other publications freely distributed by the USDA Forest Products Lab, and the collection at the UC Berkeley Forest Products Library made the challenging task of writing about the paper industry from southern California more manageable.

Although I discovered that books are never really completed and that writing them is indeed a lonely business, I also came to appreciate the invaluable role that friends and family play in the process. Susan and Dan Todd and my other river friends provided wonderful companionship (and dependable duct tape reserves) in wild places where I could both forget about the book and remember why it was worth writing in the first place. Marty Fujita, Dana Livingston, Susan Todd, and my sister, Frances Smith, were my sounding boards (sometimes at very long distance) for the low points. My deepest gratitude is reserved for my mother, Phyllis Smith. She informed me at the outset that I was crazy to take this on and then, in her own uniquely gracious style, provided unqualified support for the duration.

Introduction

The recycling movement of the 1980s had two distinctive characteristics. On one hand, recycling had been propelled back onto the national environmental agenda by the garbage crisis that emerged in the 1980s and immortalized in images of the wandering garbage barge from New York. The underlying strength of the movement was largely rooted in the burgeoning community-based "Not In My Backyard" opposition to toxic hazards that both the development of new landfill capacity and the construction of municipal solid waste incinerators would bring, and in the standoffs resulting when cities and counties attempted to site new facilities in the face of organized citizen resistance. Thus in this latest incarnation, recycling was almost exclusively framed as a solid waste management alternative and as such reflected a strikingly narrower set of concerns than had earlier recycling movements.

On the other hand, recycling had crystallized as a popular idea like never before. In the media events leading up to Earth Day 1990-an extravagant 20th anniversary celebration of the first Earth Day-recycling was undeniably at center stage. Reflecting a central theme of Earth Day events, which were strongly characterized by a focus on personal responsibility for the environment, recycling was portrayed as the single most accessible expression of the concept of "think globally, act locally": a way to square one's personal behavior with one's principles, and something everyone could do. "Recycling," observed one participant at the 1990 National Recycling Congress, "has a lot of power right now." It had become a mainstream movement supported by all the major environmental groups. Its organized forms, such as the National Recycling Coalition and various state and regional associations, were

dominated by public and private solid waste professionals, independent recyclers who operated collection and brokering services, and various secondary materials industries and other businesses involved in recycling.

Although the federal government had largely abandoned municipal solid waste policy to the states in the early 1980s (nevertheless continuing to demonstrate a strong level of support for the development of solid waste incinerator projects), a number of public policy makers, ranging from city councils and county officials at the front lines of the solid waste crisis, to state legislators, were quick to join this immense groundswell of popular support for recycling. Although the policies and legislation that began to emerge around recycling and solid waste management by the mid-1980s were extremely heterogeneous and often haphazardly defined, they had reached flood-stage by the late 1980s. In 1988 alone, one organization estimated that approximately two thousand solid waste bills had been introduced in state legislatures. ¹

In the midst of celebrating and legislating this powerful new commitment to recycling, however, some problems began to emerge, especially around wastepaper. The single largest component of municipal solid waste, wastepaper had been a major focus of the new recycling legislation, and old newsprint (ONP) in particular had been among the first materials to be targeted (along with aluminum cans and glass) in the rapidly growing number of mandatory collection programs. In late 1988, and increasingly throughout 1989 and 1990, articles and editorials began to appear with headlines such as "Surfeit of Used Newsprint Erases Profit in Recycling," "Some Newspaper is Landfilled; Programs Halt Collection Efforts," and, succinctly, "Is Recycled Paper a Waste?"²With, apparently, good intentions all around, it nevertheless appeared that for ONP at least, the market had collapsed.

Around the same time, although at a less publicly visible level, tentative questions began to be raised regarding the potentially negative environmental impacts of secondary materials-based manufacturing processes themselves. In the case of paper recycling, these early concerns were expressed primarily in relation to the toxicity of process sludge contaminated by heavy metals from inks and by PCBs, which were thought to come from the recycling of older carbonless copy papers. They largely served to introduce the topic of chemical pollution as a serious element

of the modern recycling dialogue among environmental groups and solid waste professionals. However, these concerns also intersected with a sharply rising level of concern over pollution from virgin woodpulp mills. Focused initially on the formation and release of dioxins and other highly toxic organochlorine compounds formed as by-products of chlorine-based pulp bleaching processes, these concerns eventually carried over into the subject of paper recycling technology in terms of the direct use of chlorine and chlorine compounds in deinking processes, as well as in the form of suggestions that deinking chlorine-bleached wastepaper might somehow concentrate the dioxin problem.

As the investigation of wastepaper processing technologies got underway, however, the growing controversy over organochlorine and other toxic chemical pollution from woodpulp mills was accelerated by the 1989 publication (based on 1987 data) of the first figures from the new Toxics Release Inventory (TRI) a database of chemical releases compiled by the EPA from mandatory reports filed by large manufacturing facilities. Out of all the major manufacturing sectors, the paper industry ranked third (behind chemicals and primary metals manufacturers) in total releases of roughly three hundred reportable toxic chemicals, and second for releases to air, averaging hundreds of millions of pounds per facility of total annual releases of TRI chemicals. 3

Although the late 1980s recycling movement was dominated by a solid waste framework, the exploding popular literature on recycling had in fact tended to include at least some claim to the more historically celebrated aspects of recycling, such as pollution reduction and resource conservation. During the oil crises of the 1970s, for example, energy conservation advantages had provided one of the strongest arguments for increased recycling (although ultimately with little effect). A few years earlier, as a contribution to the first Earth Day, Garrett de Bell had written, "Recycling is a major part of the solution of many environmental problems. It is important to air and water pollution and to wilderness preservation." 4

For the most part, however, these other environmental arguments for recycling, almost totally unexplored since the 1970s, were simply tacked onto modern recycling rhetoric in the form of a kind of assumed "bonus package" of benefits. Yet, as a few analysts began to seek information

not only to confirm some of these other advantages, but to explore the pollution implications of potentially substantially increased secondary materials-based manufacturing (manufacturing that was likely to be situated near population centers "urban forests" or "urban mines" that supplied the secondary materials, they found a major void in the technical and policy literature on recycling technology and its environmental impacts.

While the national recycling movement was approaching its crescendo in 1990, a different story was unfolding in the Pacific Northwest where decades of conflict over the decimation of what had come to be known as the "ancient forest" were coming to a full boil. Although the conflicts were longstanding, they had recently escalated to national proportions due to controversy over the prospective listing of the Northern Spotted Owl as an endangered species and to comparatively aggressive new initiatives such as California's "Big Green" and "Forests Forever" ballot propositions. Although ultimately defeated in the face of well-funded industry opposition, these propositions reflected an increasingly widespread public understanding of and opposition to the forest policies being played out not only in the western United States, but throughout North and South America, southeast Asia, and elsewhere in the world.

Ironically, although the connection between trees and paper is generally recognized by the public, it has long had a sort of mythic status one rarely informed in terms of how much timber, from where, and for what products. The connection between trees and wastepaper has been even more obscure. As an environmental issue, the enormous impact that paper production has on forests, and the potential for it to be diminished by increased paper recycling, had no real constituency of its own. Despite the resuscitation of 1970s rhetoric about saving trees by recycling, forest conservation and forest advocates were not directly connected with the recycling movement at the time, and forest policy and solid waste policy remained poles apart. Nevertheless, forests were being wrecked, almost everyone was upset regardless of which side they were on, and paper recycling was supposed to save trees. Clearly, a connection needed to be clarified.

Against this background, in late 1989 and early 1990, the questions that eventually led to this book were originally formulated. Focused

initially on paper recycling, this study sought to investigate three related questions. First, taking off from the collapse of the ONP market, what were paper manufacturers doing about increasing their capacity to utilize wastepaper, and were they being "sluggish"? Second, what did paper recycling really offer in the way of energy conservation and pollution prevention? Was it a "clean" technology, at least substantially cleaner than woodpulp production, or did it raise unique hazards? Finally, what exactly was the connection between paper recycling and forests? The objective was to develop not only a perspective on improved policy and legislative approaches to increased paper recycling, but also an understanding of increased secondary materials use that more accurately reflected its broader environmental and economic dimensions.

During the late 1980s and early 1990s, as recycling development took hold, and as the controversy over forest management and timber supply continued to escalate, both the chlorine issue and the general subject of pollution from virgin pulp production mushroomed in significance and began to drive the industry in equally powerful ways. At the same time the subject of tree-free paper, or the use of annual plant fibers (nonwoods) in papermaking, emerged on the national radar screen in the early 1990s. As they began to promote this compelling alternative fiber supply, advocates pointed to both decades of research by the USDA and the established use of annual fiber crops and agricultural wastes for papermaking in other countries. They suggested a range of potential benefits, which in several respects mirrored those thought to be associated with paper recycling.

As important as each of these issues is in its own right, what ultimately becomes clear is that the most significant underlying questions concern the relationship between them, and the degree to which the opportunities and barriers in each area are linked by the nature and structure of the pulp and paper industry itself. Situated within the context of the forest products industries as a whole, the paper industry is the nexus of a complex set of environmental relationships that run from the resource base to the postconsumer disposition of wastepaper. Although this may in some respects be obvious, an industry-centered perspective on materials utilization and environmental impact a central theme explored in this book in fact represents a significant departure from dominant

frameworks in which environmental issues are usually approached. Few environmental policy initiatives have adequately represented either the primacy of the industrial role or the degree to which it connects and arbitrates a range of environmental issues that may seem remote and disparate to those who specialize in any one issue.

Recycling policy is illustrative. Recycling, as the word itself implies, has come to be understood as a circular process of materials use. It is frequently divided into three or more broad phases, generally: the recovery of recyclable materials, the use of recovered materials by manufacturers, and the purchase and use of products containing recovered materials. The contemporary recycling movement has focused primarily on the first phase, and more recently on the last, but relatively little on the critical industrial link between the two. This has been reflected in the pervasiveness of narrowly framed supply-and-demand approaches to recycling policy. Whether viewed in terms of barriers or incentives, supply-side approaches have typically focused on the operational and financial logistics of municipal recovery programs such as residential and commercial collection schemes, have debated the subject of extensive source separation versus intermixed collection with centralized materials separation facilities, and have examined mechanisms for brokering recovered materials. The theory, of course, is that when secondary materials supplies become plentiful, cheap, and dependable as a function of improved supply-side programs, manufacturers will naturally switch to them. Demand-side approaches attempt to create favorable market conditions for recycled products. They focus on government procurement programs and on other mandatory or voluntary standards for recycled content in products, or on "green consumption" in general.

In the debates that have been underway since the late 1980s over the reauthorization of the federal Resource Conservation and Recovery Act (RCRA), the primary federal law affecting municipal solid waste management and thus recycling, "markets" has become the key buzzword. It ambiguously refers to both intermediate manufacturing markets for recovered materials, and to commercial and end-user markets for recycled products. The manufacturer, situated between the recovered materials and consumers, is usually targeted, at best, as a sort of indeterminate middle market for secondary materials. This intermediary, it is hoped, is

sensitive to at least some forms of remote control by manipulation of external supply-and-demand conditions, but has otherwise been treated as something of a black box.

Understood from an industry-centered perspective, however, recycling is fundamentally an issue of raw materials substitution or, at least, augmentation within a given industrial sector, with an array of associated technological and other implications. As such, the use of secondary materials, although clearly not unrelated to external supply and demand conditions for secondary materials and recycled products, has a powerful life and logic of its own that may be equally or more important in determining the level, form, and benefits of secondary materials use in manufacturing. This internal logic is highly dependent on such factors as the existing industrial infrastructure and capital commitment, materials supply lines, geographic distribution and location, dominant technologies, research and development capacity, economic integration with other industrial sectors, as well as internal and external structures and institutions that reflect both existing and historical forms of regulation and subsidy. Understanding and influencing the prospects not only for increased recycling, but also for the "cleanest" and most appropriate forms of secondary materials-based manufacturing, requires at a minimum a clear understanding of the industrial context in which potentially major shifts in basic materials, technology, and economic relationships that is, industrial restructuring-must occur.

Among other things this view highlights the fact that we might expect very different circumstances and might need to develop very different sorts of approaches, depending on the materials we, as a society, are interested in recycling at accelerated rates. Such approaches might logically be expected to vary as widely as the key manufacturing and other industries that will make use of those materials do, ranging from primary metals manufacturing (aluminum, steel and other scrap metals) to oil refineries (used oil) to chemical and plastics industries (recovered plastic). The task, from this view, is less one of developing recycling industries, than it is one of *redeveloping* basic materials industries.

We must also bear in mind that as a society we have begun to demonstrate at least a rhetorical interest in imposing some discipline on our consumption of these materials as exemplified in the popular slogan

"reduce, reuse, recycle" and in the position of "source reduction" at the top of officially adopted hierarchies of solid waste management priorities. One can hardly fail to recognize the significance of the mass production-oriented commodities producers in terms of prospects for pursuing a source reduction agenda.

In addition to the need to focus on the core industry itself, however, it further becomes evident that an approach to policies seeking to influence progress on solid waste reduction and other environmental goals by way of changing traditional patterns of materials use must deliberately accommodate a broad spectrum of associated environmental issues from the outset; it is not sufficient to assume that the "bonus package" of energy, pollution, and natural resource benefits will be automatically forthcoming. Thus, the second major theme of this study is integrated environmental analysis. Energy consumption and environmental pollution associated with pulp and paper production (whether based on virgin or secondary materials) are strongly interdependent and cannot be meaningfully considered in isolation from one another, just as downstream solid waste disposal problems cannot be isolated from natural resource problems nor from rising levels of per capita consumption.

In the absence of approaches based on integrative and systemic environmental analyses, expectations are often dashed, and important opportunities overlooked or foreclosed. At worst, serious distortions of intention can and do arise in strange and unpredictable forms and may be as likely to create new environmental problems as to solve those originally targeted. Many such instances have occurred in the recent history of the paper industry, instances that can be traced equally to traditional narrowly defined agendas and to the black box approach to industrial dynamics. Among those considered in the following chapters are the effects associated with the exaggerated emphasis on the use of postconsumer wastepaper as a panacea for paper industry environmental problems; a continuing and substantial disjuncture between forest conservation and wastepaper use (in effect, paper recycling without saving any trees); the strengthening of pollution control strategies that run counter to sustainable materials use policies; and early signs that the augmentation of the resource base that wastepaper has provided may

have accelerated both total production and consumption of pulp and paper.

Those who have followed developments in pollution prevention policy may recognize the outlines of some familiar constructs here. Given national status by the passage of the federal Pollution Prevention Act of 1990 and the EPA's "pollution prevention strategy" outlined in 1991, pollution prevention has been widely embraced as the new paradigm that will guide the next generation of national efforts to reduce environmental pollution.

Although subject to conflicting and evolving interpretations, pollution prevention is usually broadly defined in contrast to the pollution control approach that has traditionally characterized toxic and hazardous substance regulation. The dominant characteristics of pollution control are expressed at the national level in a variety of key pieces of legislation ranging from the Clean Air and Clean Water Acts to the Occupational Safety and Health Act, RCRA, and others. They centrally incorporate (1) a direct-regulation (command-and-control) format, and (2) a medium-specific format (i.e., a focus on the individual "media" of environmental pollution, such as air, water, land, and consumer products). The inefficiencies of both the direct-regulation and medium-specific formats, it is proposed, will be overcome by a new, preventative paradigm that seeks to address multimedia pollution at "upstream" sources (such as at product and process design phases, and by reducing or eliminating the use of toxic substances) rather than at the "end of the pipe" (e.g., smokestack, effluent outfall pipe, landfill) where attention and resources have long been focused.

Much of the debate in defining pollution prevention has turned on which of these two aspects of pollution control is emphasized as the underlying take-off point for pollution prevention. On one hand, pollution prevention is said to be centrally defined by a new relationship between industry and government, in which interventionist and bureaucratic direct-regulation formats are to be forsaken (or at least partially supplanted) in favor of more voluntaristic and flexible methods that will strategically harness the power of competition to stimulate profitable clean technology and other environmentally beneficial innovations. On