

THE POLITICS OF PVC

by

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For my father, H. Douglas Vess

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CHAPTER I

THE POLITICIZATION OF PVC

“I just want to say one word to you, Ben—just one word.”

“Are you listening?”

“Yes I am,” says Ben.

“*Plastics.*”

The Graduate (1967)

Every day, a typical resident of the United States encounters and uses countless plastic products and materials. Plastics have dramatically altered almost every aspect of our lives, from how we grow, shop for, and prepare our food, to how we travel. They affect how we communicate and interact with others, whether we are using a cell phone or hosting a party. The American Chemistry Council assures us that “plastics are helping to create a better planet and a safer world” (www.americanchemistry.com). Since the development of the first synthetic plastic in 1909, plastics have expanded the array of conveniences and products that are conceivably beneficial in certain realms. However, in light of the unintended consequences that accompany plastics, “better” and “safer” are disputable terms. While innovations in plastic development may have improved the human condition—think of child safety seats or medical devices—the ascendancy of plastics has also spawned a multitude of products that directly create health, ecological, and social concerns.

This research is the story of one of those plastics, polyvinyl chloride (PVC)¹, and how its use came to be challenged and politicized because of the environmental, social, and health risks associated with PVC’s toxic lifecycle. I investigate the major stakeholders in current PVC debates, focusing on the strategies and tactics employed by organizations, businesses, and activists who draw attention to the hazards associated with PVC or seek to eliminate its use. How do both PVC proponents and opponents frame the issues and respond to one another’s actions? Who is more successful in their approach

¹Some forms of PVC are also commonly referred to as vinyl. The two terms are used interchangeably in this study.

and why? For opponents, what are the major barriers they confront? In sum, the purpose of this research is to answer how and why stakeholders have politicized PVC by examining the political, scientific, social, environmental, and health debates that surround its use.

Among the plastics, PVC is the second most common, with more than 14 billion pounds of vinyl produced annually in North America (www.vinylinfo.org). The chemical and plastics industries have successfully introduced PVC products into almost every sphere of our lives. However, environmental and health hazards associated with PVC have led some environmental health researchers and academics to regard PVC as one of the worst offenders for environmental damage (Thornton 2000; Markowitz and Rosner 2002). Of all the plastics, PVC is the most persistent, or least likely to break down, in the environment (Markowitz and Rosner 2002). Other chemicals, including some suspected carcinogens, are commonly added to vinyl to make the plastic soft and flexible, and can leach from the plastic. PVC production requires large amounts of chlorine, thus contributing significantly to the formation of dioxin, a known carcinogen.² PVC's toxic lifecycle has human and ecological impacts at every stage – in production, use, and disposal. The combined impact of these three stages has led biologist Joe Thornton, author of *Pandora's Poison: Chlorine, Health, and a New Environmental Strategy* (2002) to assert “The plastic [PVC] that is all around us, and expanding its role in our lives all the time, turns out to be one of the most hazardous materials on earth....” (p. 318).

In the early 1990s Greenpeace became the first national environmental organization to raise concerns about PVC, and began to specifically target U.S. chemical companies that manufacture the key chemicals used in PVC production (Costner 1995). Subsequently, an anti-PVC movement has emerged on several fronts. Two industries—healthcare and green building—emerged as prominent in this movement because of the predominance of PVC use in medicine and construction.³ Vinyl is the most widely used

² Dioxin belongs to a family of 419 chemicals with related properties and toxicity, but the term ‘dioxin’ is often used to refer to the 29 that have similar very high levels of toxicity. The most toxic form of dioxin is 2,3,7,8, tetrachlorodibenzo-p-dioxin or TCDD.

³ Green building is the process of designing and constructing buildings with a smaller ecological footprint than traditional non-green buildings. Defining what counts as a green building can be difficult. Some

plastic in healthcare, and more than 75 % of the PVC manufactured is used in construction and building, by both traditional as well as some green builders. PVC plastic constitutes almost 25 % of health care products and packaging currently in use (Shaner and Botter 2003). Within these two industries, a variety of stakeholders approach this issue from different fronts and with different objectives. Much of the movement towards phasing out or eliminating PVC has emerged internally, with professionals in these industries emerging as key leaders of the movement. In this sense, the anti-PVC movement is largely occupationally-driven. However, because of the predominance of PVC use in healthcare and building, PVC has also been targeted by broader-based environmental, health and other public-interest organizations. The missions of the health care and the green building industries involve protecting and promoting human and environmental health, thus as professionals and leaders in these fields learn of the known and suspected health and environmental risks of PVC, they push for greener healthcare and for sustainable design and construction.

While PVC is prevalent in the healthcare and building industries, it is also ubiquitous in our homes and the built environment. PVC is relatively inexpensive to produce, durable, and becomes more adaptable and versatile with the addition of plasticizers (used to change the hard, raw PVC into a soft polymer) and other additives or stabilizers (heavy metals such as lead or cadmium and fungicides and other toxic chemicals).⁴ Because of these characteristics, it has become a widely used replacement for woods, metal, glass, rubber, ceramic, and even other plastics. Dozens of items that we use or encounter daily contain PVC plastic: children's toys, automobile parts, medical equipment, electronic applications (e.g., keyboards, electrical cords, computers, etc.), packaging material, piping, siding, windows, furniture, flooring, office supplies,

builders incorporate green features (energy-efficient lightbulbs, low-flow toilets, low VOC paints, recycled wood, etc.) while others use integrative design processes to develop a much more comprehensive sustainable facility. Overall, the objective is to create healthy and sustainable buildings in which to live and work.

⁴ Phthalates are the dominant group of plasticizers and are known animal carcinogens. In laboratory animals, they have been found to damage the reproductive system, causing infertility, testicular damage, reduced sperm counts, and suppressed ovulation (Thornton 2002). Phthalate concerns will be discussed in greater detail elsewhere.

window blinds, shower curtains and more. As *Architecture Week* notes “Chances are good that you are within arm’s length of vinyl at this moment” (Cockram 2006:E1.1).

In what follows, I examine efforts to politicize PVC use, particularly in the health care and green building industries, and the ensuing socio-political struggles.⁵ Within the medical community, an array of stakeholders – businesses, manufacturers, healthcare providers and facilities, unions, professional associations, and environmental health organizations⁶ – are involved in efforts to limit or phase out PVC use in healthcare. Similarly, among green builders, sometimes referred to as “sustainable” or eco-builders,” there are architects, designers, developers, and general contractors dedicated to using environmentally responsible building strategies who seek to reduce PVC use.

The Politicization of PVC

Politicizing PVC entails the ways activists or stakeholders work to frame issues and mobilize support for their cause. Understanding the process of politicization involves an in-depth examination of how PVC has emerged as a focus of activists, professionals, and others within the healthcare and green building industries. Politicization involves the interplay between these groups and others, such as vinyl-related industries and trade associations that resist challenges to PVC use and work to promote a positive public perception of PVC. While stakeholders vie to control public discourse surrounding PVC and to influence decision-making bodies or market direction, this struggle is not a clear-cut story of opponents versus proponents. The relation of each stakeholder group to the PVC product – whether as producers, users, workers, or contesters—creates a complexity of interests among various stakeholders.

The political and economic context that led to the rise of PVC begins with the expansion of the petrochemical industry and plastics development during World War II. The conditions that led to the development of PVC—rapid economic growth, the development of new technologies, a shift in industrial practices from supporting the

⁵ Hereafter, unless otherwise indicated, reference to PVC’s health and environmental concerns should be understood to include all aspects of the PVC lifecycle.

⁶ Environmental health organizations examine the intersection of public health and environmental damage and seek to remedy the health problems and injustices that result from the interactions between humans and their environment. Environmental health activists generally start from the standpoint that humans are largely responsible for the environmental problems that led to health issues.

military to appealing to consumers—also led to the development and production of a myriad of chemicals, materials, and products that have their own set of health and environmental problems. In our society, we are exposed to a plethora of toxics daily. It is not possible to investigate each of these toxics; however, given PVC's status as the most contentiously plastic, perhaps this research may yield insight into understanding existing or potential social movements surrounding environmental health concerns within the same political and economic context. Environmental and public health advocates contend that government regulation or monitoring of these chemicals is limited, relies heavily on industry-supplied data, and does little to protect the environment and human health. However, in the face of growing environmental health problems, scientists, academics, business leaders, and activists are mobilizing. This contingency of advocates recognizes the interconnections between human actions and environmental change. They seek application of a more precautionary, or cradle-to-cradle, approach to our use of these chemicals and materials.

In order to understand the politicization of PVC within the healthcare and green building industries, I focus on two sets of interrelated questions: 1) Why have green building and healthcare professionals and their allies become involved in politicizing PVC? Within these two industries, who are the major stakeholders? What is the political and economic context that led to the politicization of PVC in general, and more specifically in these two industries? What major events or debates occurred within these two industries to bring PVC to the forefront of action? How have these debates played out? 2) How have PVC opponents mobilized around their cause and, concurrently, how have PVC proponents responded? What complications or disputes have PVC opponents encountered from vinyl interests, or from within their own movement? What aspects of PVC's lifecycle are opponents contesting? How does this vary by organization, profession, occupational power, unionization status, and gender? What are opponents' different objectives in regard to PVC, and what methods do they use to achieve these? Are stakeholders able to make convincing claims as to the verity of their position? What are the targets of opponents' mobilization? Do opponents direct their actions within the

within the healthcare industry or within the green building profession? Or is action directed towards shaping public perception and consumption habits?

Chapter Outline

In Chapter 2, *Why PVC? Sociological Significance*, I address how research on the politicization of this particular plastic can inform the social movement, public health, sociology of science, environmental sociology, and sociological health and medicine literatures, thus demonstrating the sociological significance of my study. I introduce the major stakeholders and advocacy organizations involved in PVC's politicization and I present a brief historical overview of PVC's development to contextualize current debates. I then answer the question "Why PVC?" from an ecological and health perspective in order to show differences in how PVC concerns are framed and then acted upon by challengers to its use. Finally, I outline the role that government agencies and policies have played in shaping this movement and the debates central to it. It should be noted that while the environmental, occupational, and human health problems linked to PVC are not bound by national borders, the organizations and individuals in this study are based in the United States.

In Chapter 3, *Pushing the Boundaries of Health and Social Movement Theory: The Anti-PVC Movement*, I use the social movement literature to provide a theoretical examination of the anti-PVC movement. I argue that the anti-PVC movement is largely an occupationally driven movement within the health care and green building industries of the economy. The primary goals of the movement are market transformation (development and purchasing of non-PVC products) and the education of professionals or businesses within both these industries of PVC harms. Next, I examine the anti-PVC movement within the health care community as a health social movement (HSM). Phil Brown and colleagues (2004) have developed a typology of HSMs; I add to this typology with a fourth ideal type, the 'Public Interest Health Movement,' or PIHM. I discuss the role that professional advocates play in PIHMs and how their class position impacts strategies, tactics, and goals of the movement.

Chapter 4, *Frames, Counterframes, and Movement Formation*, provides an historical overview of the anti-PVC movement, including primary debates between

movement adherents and opponents. I focus on the emergence of the movement, specifically its framing concerns and countermobilization tactics. I introduce and examine some of the initial and key framing strategies employed by various stakeholders. I argue that there have been three waves of PVC activism, beginning in the 1970s with occupational health and fire safety concerns, followed by the second wave in the early 1990s with Greenpeace's chlorine chemistry campaign, leading to the current third wave of the anti-PVC movement found predominately in the health care and green building industries. I also consider the use of scientific arguments in shaping the politicization of the health and environmental hazards of PVC. Finally, I examine the arguments and strategies that the vinyl industry employs to refute challengers and delegitimize activists.

In Chapter 5, *First, Do No Harm? PVC in Health Care*, and Chapter 6, *Building Political Opposition to PVC: The U.S. Green Building Council and Beyond*, I take an in-depth look at the politicization process first within the medical and health care community and then within the green building community. In each case I examine how stakeholders frame their concerns and establish their objectives, and how these decisions influence their tactics and strategies. The health care industry responds most significantly to PVC problems framed as patient health or ethical concerns. Activists in the green building community draw attention to end-of-life problems with PVC disposal. In chapters five and six, I also assess the relationship between stakeholders' strategies and their ability to influence PVC use. I find that stakeholders in the health care branch of the anti-PVC movement more successfully use their economic clout to shift the marketplace towards PVC alternatives. I conclude that vinyl industry interests have been able to influence the green building industry to a greater degree than occurs in the health care industry.

In the final chapter, *The Politics of Toxics: Toward New Movements and New Alliances*, I examine the story of PVC as an example of the social conflict that arises when profits are valued over human and ecological health. I evaluate the solutions offered by those who politicize PVC, and using the treadmill of production literature, I argue that their recommendations propose few structural changes that would address the causes of environmental and health risks. Many proposed solutions tend toward the

ecological modernization perspective, whereby new technologies or reformist market changes are claimed to resolve the problems associated with PVC. Rather than demanding increased government regulation of chemicals and potentially toxic products, or proposing a shift away from excessive consumption and convenience, the emphasis is placed on market change and increasing awareness about toxic threats among professionals in the field and consumers. I compare the approach of the health and green building movements in terms of framing of the problems, objectives, tactics, and their interactions with the vinyl, chemical, and plastics industries. Finally, I discuss why this matters; what lessons have been learned and what does an analysis of PVC politicization tell us about environmental health movements and the contested nature of health problems that are environmentally and economically induced.

Methods

This dissertation relies on documentary research and in-depth interviews with a non-probability sample of individuals and representatives of organizations involved in phasing out PVC or active in PVC campaigns and the politicization of PVC. A detailed methods section is found in Appendix A. Documentary research was used to examine written accounts of the socio-political history of PVC, current debates surrounding PVC use, and the positions, objectives, and actions of stakeholders. This material included scientific reports, government documents, research studies, books, papers, and articles, as well as the websites, press releases, newsletters, and position papers of various organizations. Twenty in-depth interviews (including four follow-up interviews) were conducted, each lasting approximately forty-five minutes to one hour and forty-five minutes, as well as two shorter interviews. I also attended several green building seminars and a Habitat for Humanity event.

The research allowed me to create a list of the major and minor stakeholders and activists involved in the PVC debates. I determined that there are essentially three categories of organizations and websites involved in debates about PVC. To borrow terminology from world systems theory, these can be referred to as the core, semi-periphery, and periphery. Core protagonists of the movement include organizations that are actively engaged in the debates. The semi-periphery—the largest category—includes

groups or websites that are participants in the movement and which may educate others, but are not as directly involved. The periphery includes organizations whose involvement is limited or intermittent. As part of my efforts to understand and follow the debates surrounding PVC, I regularly checked websites of these organizations in addition to others that cover environmental health, green building, and vinyl industry interests.

Information gathered from print and Internet sources was supplemented with interviews with representatives from all the organizations in the core, as well as some in the semi-periphery. Interviewees were contacted using a combination of snowball and purposive sampling. All respondents, except the vinyl industry representatives and a medical supplies representative, waived confidentiality.⁷ Interviews were voluntary, semi-structured and open-ended, and geared toward discovering how stakeholders work to politicize and remedy the problems associated with PVC use, or to discover the perspectives of PVC proponents and how they engage in the debates. The interviews covered the framing of PVC concerns, organizational structure and activism (including objectives, strategies, perceived solutions, coalition formation, etc.), influence of actors on (or perceived influence) corporate decision-making and government policy, barriers to movement success (from within and outside of the movement), and environmental and occupational health training, if appropriate (see Appendix B for an interview guideline). I adjusted each interview guide to accurately reflect the type of organization (i.e., business, union, environmental health) the interviewee represented. I digitally recorded all interviews, downloaded the audio onto my password-protected computer and subsequently transcribed and coded the interviews.

⁷ I formally met with two vinyl representatives during my in-person interview; however, one of them rarely spoke. My interview had been scheduled with the other person and her presence was never explained to me. Pseudonyms are used for the vinyl representatives throughout the dissertation.

CHAPTER II

WHY PVC? SOCIOLOGICAL & ECOLOGICAL SIGNIFICANCE

PVC opponents have called PVC the “poison plastic,” “a toxic nightmare,” and “the dirtiest plastic from creation to death” (Walsh 2005e; CHEJ 2006; Conrad 2006). No other plastic is denounced or singled-out to the same degree as PVC. The seriousness of the claims made by the anti-PVC movement and the shift away from PVC use by a multitude of companies highlights the importance of understanding this movement. The anti-PVC movement is allied with unions, environmental justice groups, sustainability advocates, and healthcare activists. Social movement literature on environmental and environmental justice movements, health social movements, and the labor movement helps to inform the anti-PVC movement and contextualize it sociologically. In addition to social movement literature, my dissertation draws upon the theoretical and empirical work from the sociology of health and medical sociology, environmental sociology, sociology of science, and labor studies.

Sociological interest in the relationship between the environment and human health has led researchers to explore the political debates and scientific disagreements concerning environmental illnesses and health risks, as well as public participation in the construction of an illness or an environmental health problem. As a politicized toxic threat, PVC controversies are similar to other contested environmentally-induced health problems. Disagreement arises first over whether PVC (in any or all stages of its lifecycle) is a source of environmental and human harm. Secondly, *if* all stakeholders concede this point, disagreement arises over the degree to which PVC is deemed harmful and whether those risks are “acceptable.”¹ Thirdly, conflict arises over decisions regarding what, if any, actions should be taken.

The sociological tradition of investigating the environmental and social roots of illnesses began with Marxist theorists in the mid-nineteenth century. In the 1840s,

¹ Inherent in risk assessment, the traditional model for assessing risks, is that some risk is acceptable. However, this is a political rather than scientific judgment (Clark 1989).

Friedrich Engels documented occupational and environmental conditions that caused illness and early death as a consequence of the organization of economic production and the social environment ([1845] 1973). Continuing this tradition, social medicine pioneer Rudolf Virchow (1821-1902) and former Marxist Chilean president Salvador Allende (1908-1973) analyzed the social origins of illness, emphasizing how inequalities are rooted in the distribution and consumption of social resources and underdevelopment and imperialism respectively (Waitzkin 1981). According to Waitzkin, all three of these scholars determined that disease was not simply a matter of an infectious agent or pathophysiologic disturbance, but an outcome of multifactorial causation, including malnutrition, economic insecurity, occupational risks, bad housing, and lack of political power. The historical contributions of Engels, Virchow, and Allende provide a foundation for examining the social causes of disease, and as Waitzkin contends, the social pathologies that distressed these men – inequalities of class, exploitation of workers, and conditions of capitalist production – continue to cause illness and disease.

As Waitzkin (1981) and his predecessors note, without systematic and structural changes that alter the relationship between capital, the environment, and workers, environmentally-induced health problems will continue to rise. A number of social movements have formed in reaction to such health inequalities. According to Phil Brown et al. (2004), social movements organizing around health issues can be traced back at least to concerns with occupational health during the Industrial Revolution. Since then, health social movements have emerged in response to issues including: women's health, breast cancer, patients' rights, general health access, disability rights, mental health rights, AIDS, tobacco control, and occupational health and safety.

These movements are well-deserving of study, as are environmental health movements. However, most research in this area tends toward examining either environmental movements *or* health movements. When environment and health are studied in conjunction with one another, the focus is almost exclusively on environmental justice.² Environmental justice scholarship is an extremely important area of research, but one that does not encapsulate all environmental health movements. Environmental and

² An important exception is Phil Brown and colleagues whose work is used extensively here.

occupational health social movements have played a significant, if sociologically understudied, role in U.S. public health history.

As Gottlieb (1993) has documented, public health and anti-pollution activists have long struggled to reform the institutions contributing to social inequalities in health and environmental equity. This activism has an historical and current gendered dynamic to it. In the early decades of the twentieth century, the problems of industrial disease were frequently ignored, attributed to poor worker hygiene, or unstudied. Though not commonly known, the era was marked by a number of influential women active in community and occupational health. Alice Hamilton, “the mother of American occupational and community health,” was instrumental in investigating and documenting hazardous industries and substances. Gottlieb (1993) describes Hamilton becoming “the country’s most powerful and effective voice for exploring the environmental consequences of industrial activity” by the 1920s (p. 10,51). Florence Kelley served as a strong advocate for workplace and community reform for women and children. Kelly led the National Consumers League, linking the problems of degraded environments with workplace issues and drawing national attention to hazardous workplace conditions. In recent decades, women have emerged as committed leaders within the environmental justice movement. The dedication of women to community environmental health and well-being continues into the anti-PVC movement. For example, under the leadership of Lois Gibbs,³ the Center for Health, Environment and Justice has prioritized dioxin and PVC health and environmental concerns. In the health care industry, nurses are becoming increasingly involved in campaigns to make their workplaces safer for patients and the environment through efforts to rid their facilities of PVC and other harmful toxics. In this way, PVC activism is a return to, or perhaps a continuation of, the intersection of environment and health as expressed by women.⁴

³ Lois Gibbs is widely regarded as being an instrumental leader in organizing and working with her neighbors in Love Canal, New York. In 1981, she founded the Center for Health, Environment and Justice, a non-profit organization, providing assistance to grassroots community organizations. The Center’s Be Safe/Anti-PVC campaign establishes its position as a ‘core’ organization. Gibbs is also the author of *Dying from Dioxin: A citizen’s Guide to Reclaiming Our Health and Rebuilding Democracy* (1995).

⁴ There are many factors that account for women’s involvement these movements that are beyond the scope of this project to examine. However, for clarity, I am not suggesting an essential argument, whereby

Environmental Justice

Although the anti-PVC movement as it is manifested within the health care and green building industries is not an explicit illustration of an environmental justice (EJ) movement, the relationship between environmental justice and PVC health and environmental concerns is unquestionable. The EJ movement is principally concerned with “the relationship between environmental degradation and social and economic injustice, particularly in relation to race, gender, and class oppression” and attends to the intersection of health, the environment, and politics (Foster 1994:137). Even though EJ did not emerge as a central frame for some of the activists and stakeholders interviewed, PVC’s pervasiveness as a toxic hazard for humans and the environment situates PVC’s continued use as an EJ issue. The omission by activists likely speaks more to their own class position and may symbolize the inattention to the classed and racialized health inequalities that EJ activists have criticized mainstream environmental organizations for ignoring.

Environmental justice seeks to encompass “both the racial and the class aspects of the political economy at work in communities that face toxic assault” (Cole and Foster 2001:15). The siting of vinyl manufacturing facilities and incinerators and the myriad of associated toxic problems (particularly exposure to dioxin), are structured along race, class, and gender lines. In the United States, vinyl production predominates along the Mississippi River corridor, or “Cancer Alley,” a region infamously renown for the dominance of petrochemical facilities and other polluting industries that straddle the river and the nearby predominately low-income parishes and communities of color. Eliminating dioxin, a byproduct of PVC incineration, has long been a goal of EJ activists, as documented through a history of organization and activism concerning the location of incineration facilities and hazardous waste dumps (see Gibbs 1995, 2002).

The environmental and health injustices experienced by these fence-line communities in Texas and along Louisiana’s chemical corridor substantiate the charge made by the grassroots EJ movement that people and communities of color are

women are viewed closer to nature and thus more aware of environmental concerns. Instead, I contend, the structured dimensions of their lives and gendered divisions of labor account for a predominance of women activists, as is particularly evident within the nursing profession.

systematically exposed to environmental hazards, with the unequal exposure to pollution most significantly experienced by groups marginalized by gender, age, class, race/ethnicity, and geographic location (Bryant and Mohai 1992; Bullard 1994a; Bryant 1995). Exposure to environmental hazards and case studies of resistance and mobilization against such threats have been well documented by EJ researchers and writers (see Bryant and Mohai 1992; Gottlieb 1993; Bullard 1994a, 1994b, 2002). Environmental justice activists are correct in pointing out the inequalities of exposure and of government response and regulation. Yet even with acknowledgement of such disparities, no one is safe, no community nor body free from toxics or the environmental and health risks associated with PVC's lifecycle. Examining how anti-PVC advocates prioritize health and environmental concerns and express understanding for the EJ implications of the PVC lifecycle aids in discovering both *why* and *how* PVC opponents engage in PVC politicization and current debates.

Linking Environmental Health and Justice with Workplaces

Environmental justice focuses on environmental health, yet a lesser-studied component of this research involves the interconnection of environmental and occupational health as a social and EJ issue. As previously mentioned, the controversies that surround PVC as a politicized toxic involve whether PVC is a source of environmental and human harm. Examined from the viewpoint of a production worker in a vinyl chloride monomer plant will yield not only a different set of concerns than from the perspective of someone with a different relation to the site of production, but also a different prioritization of those concerns. Where one is situated along what Orbach (1999) calls the economic-environmental nexus influences the answer to the question of harm and, similarly, their perception of degree of harm.

Many scholars have emphasized the importance of examining the point of production for understanding environmental health and justice struggles (Levenstein and Wooding 2000; Pellow and Park 2002). These researchers draw a link between the toxic exposures in workplaces and environmental justice by contending, "What is produced at the point of manufacture ultimately becomes the potential source of environmental hazard" (Levenstein and Wooding 2000:14). I agree; however, anti-PVC activists and

environmental health advocates do not always recognize or prioritize these links. Professionals in the healthcare and green building industries who are active in the movement, and clearly far from the point of production, mobilize to address the hazard of PVC as it travels throughout its lifecycle. However, the workplace does emerge as a central feature of PVC's politicization. It is not the factory floor, likely envisioned by Levenstein and Wooding, but rather more often a hospital neonatal intensive care unit or a green building conference. As Smith (1981) clarifies in her work on black lung, the workplace should not simply be understood as the physical characteristics of the site, but also as the social relations (including technologies, work organizations, and industrial/labor relations) that shape and are part of the workplace. Given that PVC is challenged most often by professionals within the field, it follows that the workplace, as both a physical place and site of social relations, influences these debates.

Sociological attention is lacking on the emergence of different sites of activism downstream, where manufacturing and community health concerns, if not expressed overtly, will nonetheless likely be impacted in some way by the mobilization of stakeholders along various points in the stages of PVC's lifecycle. For better or worse, in the case of PVC, the main concerns and debates are not expressed or centered on occupational exposure. However, by investigating the concerns, tactics, and objectives of a range of stakeholders, we gain a broader understanding of the multiple levels of activism that occur around toxic substances and other human-created environmental harms.

Contested Illness and Scientific Debates

One of the struggles facing activists and stakeholders in these movements involves "proving" a scientific relationship between environmental toxics and health. Disagreements over environmental and health risks associated with PVC have constituted key controversies in the disputes surrounding this plastic. On the one hand, PVC opponents contend that there is enough evidence indicating PVC's harm, while on the other hand, the vinyl industry insists that the connections between PVC and 'alleged' health and environmental problems are either unsubstantiated or that risks are not elevated to a point necessitating action. Stakeholders turn to different models for

assessing risk and framing the problems. Industry tends to favor traditional models, which ask, “How much harm is acceptable?” rather than aiming to prevent harm in the first place (Montague 2004). Risk assessment models are favored by government agencies and certain industries because they suggest (but do not provide) objective, rational science and allow government agencies to avoid political trouble (O’Brien 2000). PVC opponents and critics of the traditional reliance on risk assessment models for determining harm challenge this approach and reframe the debate, often by advocating use of the precautionary principle.⁵ One’s approach to evaluating risk significantly influences how stakeholders frame and steer debates.

Disputes are further intensified and complicated by the contested nature of environmental and occupationally induced illnesses and health problems. ‘Contested’ and controversial illnesses tend to be environmental or occupational in origin and call into question the biomedical model of disease (see Brown, Kroll-Smith and Gunter 2000).⁶ Environmentally induced illnesses may be caused or affected by synergistic effects of chemicals, intervening variables between exposure and effect, or chemical accumulation, thus complicating confirmation of a causal link between a chemical and a health outcome (Krimsky 2000). Defined by Brown et al. (2003), these are illnesses, diseases, or conditions “that engender major scientific disputes and extensive public debates over environmental causes” (p. 214). Environmental illnesses are marked by the absence of certainty of knowledge, often leading to social and political citizen activism (Brown et al. 2000). They may manifest as cancer as well as chemically induced reproductive, neurophysiological, and developmental effects.

⁵ Discussed in greater detail in chapters four and five, the most commonly referred to definition of the precautionary principle is defined in the 1998 Wingspread Statement, “when an activity raises threats of harm to human health or the environment, precautionary measures should be taken, even if some cause and effect relationships are not fully established scientifically” (cited in Tickner, Kriebel and Wright 2003: 489).

⁶ Mishler (1981) defines the biomedical model as assuming that disease is a deviation from normal biological functioning, that diseases have specific causes that can be located in the ill person’s body, that diseases have the same symptoms and process in any historical period and in different cultures and societies, and that medicine is a socially neutral science.

I have determined that there are at least three types of contested illnesses. The first type includes those illnesses such as multiple-chemical sensitivity and Gulf War-related illness, where the legitimacy of the actual illness or environmentally induced health problems is contested.⁷ In the second case, illnesses are recognized and *not* contested, but the environmental source or sources are disputed, particularly by the medical establishment or industries that may be responsible for contributing to or causing the health problems. Examples would include asthma, breast cancer, black and brown lung, and silicosis.⁸ In such cases, the link between health and environmental exposure is strongly suspected, but there is no definitive scientific support for an environmental causation hypothesis (see Eisenstein 2001; Klawiter 2003; and McCormick, Brown and Zavestoski 2003).

In the third type, the environmental source is a known toxic, but the relationship between it and an environmental or occupational health problem or illness is complicated because a scientific link has not been definitively established (or if so, the degree that it is harmful remains contested), or because of the difficulty in attributing the health problem or illness to a specific toxic source. As an example, phthalates, a common PVC additive, are known endocrine disruptors; however, should a person develop endocrine-related problems, establishing a link between phthalate exposure and a person's health problems is nearly impossible. Similarly, dioxin is a known carcinogen; however, it is extremely difficult, if not also impossible, to prove one's cancer arose from dioxin exposure from a particular source. As Krimsky (2000) states, "Science always favors strong causality

⁷ Illnesses that are initially contested do not necessarily retain this status indefinitely. Multiple chemical sensitivity is one of the many names given to "those chronic conditions that appear to have been brought on by exposure to low doses of ubiquitous environmental toxicants at levels" presumed safe in the past. Symptoms may include nausea, confusion, difficulty concentrating, metallic taste sensations, moderate rhinitis, tinnitus, increased and irregular heartbeat, various paraesthesias, ocular disorders, memory loss, asthma, and reactive airway disease (Kerns 2001: 1-3, 11, 27). Gulf War illnesses include nausea, loss of concentration, blurred vision, fatigue, lack of muscle control and coordination, irritable bowels, headaches, rashes, and other ailments experienced by Gulf War veterans following their service in the Gulf (Brown et al. 2003).

⁸ Brown lung, or byssinosis, is a progressive, potentially fatal occupational disease of textile (particularly cotton mill) workers which causes chest tightness, shortness of breath, coughing and wheezing (Levenstein et al. 2002). Similar to brown lung, black lung is also a progressive, potentially fatal occupational disease. The symptoms for coal miners include persistent, severe cough and sputum, breathlessness, and chest pain (Smith 1987). In the mid-nineteenth century, black lung was differentiated from silicosis, another chronic respiratory disorder, occupational in origin (Derickson 1998).

over weak causal associations, but in reality the standard of strong causality for the biological effects of chemicals on humans is rarely achievable” (p. 117). Because of the uncertainty in establishing links between toxics and health problems, this type is open to heavy politicization. For PVC, because so many of the health problems associated with its lifecycle fall into this third category of contested illnesses, vinyl interests are able to point to deficiencies or gaps in data and lack of government legislation or regulation to support their position of minimal risks from PVC lifecycle. These three categories of contested illness should be regarded as ideal types; environmental and occupationally induced health problems may shift from one category to another at different stages of politicization as new scientific data emerges or stakeholders influence the debates.

Stakeholders and Social Movements

As stated, PVC is politicized most widely within two primary industries: healthcare and green building. Chapter 2, *Pushing the Boundaries of Health and Social Movement Theory: The Anti-PVC Movement*, is dedicated to a theoretical examination of the anti-PVC movement. Before further discussing the debates and controversies surrounding PVC it may be helpful to introduce the major stakeholders, the majority of whom are anti-PVC. Organizations that fall within the core (or those actively engaged in debates, as described in Appendix A: Methods) for the health care industry include Health Care Without Harm (HCWH), Kaiser Permanente, and Catholic Healthcare West (CHW). The Healthy Building Network (HBN) and the U.S. Green Building Council (USGBC) emerge as the core organizations in the green building industry. The Center for Health, Environment, and Justice (CHEJ) and Greenpeace are core movement stakeholders that do not fall within either industry. The Vinyl Institute is the primary stakeholder involved representing the vinyl interests.

Health Care Without Harm, a coalition of 443 organizations in 52 countries, is one of the principal players in the anti-PVC movement and arguably the main organization involved in the health care industry. Its mission is “to transform the health care industry worldwide, without compromising patient safety or care, so that it is ecologically sustainable and no longer a source of harm to public health and the environment” (www.noharm.org). The inclusion of Kaiser Permanente and Catholic

Healthcare West may appear unusual; however, as large healthcare providers, their decisions regarding PVC use in medical supplies and healthcare facilities have had a substantial impact. Their actions have further politicized the PVC issue within healthcare, helping to raise awareness of the concerns, impacting medical product suppliers, and aiding in institutionalizing the debates. Kaiser Permanente is an integrated health care organization, comprised of health plans (representing 8.5 million people in eight states and Washington D.C.), hospitals, medical groups, and an affiliation with the Seattle-based Group Health Cooperative. Catholic Healthcare West is the nation's eighth largest hospital system, serving 22 million people at 42 hospitals. Kaiser's health plans and hospitals are nonprofit, as are those of CHW.⁹

The comparator organization to HCWH within the green building industry is the Healthy Building Network (HBN), "a national network of green building professionals, environmental and health activists, socially responsible investment advocates and others who are interested in promoting healthier building materials as a means of improving public health and preserving the global environment" (www.healthybuilding.net). The U.S. Green Building Council (USGBC), the preeminent green building industry coalition, plays a significant role in the politicization of PVC. In Chapter 5, *Building Political Opposition to PVC: Case Study, Green Building and PVC*, I discuss how the organization's decisions are at times the center of controversy. The USGBC is a nonprofit organization representing over 10,000 member organizations and comprised of 75 regional chapters. The organization's objective is "to transform the building marketplace to sustainability" (www.usgbc.org).

The politicization of PVC is not limited to the healthcare and green building industries. Greenpeace has been at the core of the movement since the early 1990s. Its involvement has been foundational and tremendously significant. For this reason, it is included as a core organization even though its current involvement in the movement is somewhat limited. Along with Health Care Without Harm and the Healthy Building Network, the Center for Health, Environment and Justice (CHEJ) works through partnerships and coalition building. CHEJ has been involved in "works to build healthy

⁹ Kaiser's medical groups (partnerships or professional corporations) are the exception.

communities, with social justice, economic well-being, and democratic governance” (www.chej.org). Unlike other core organizations, CHEJ is not an occupational-based organization, nor is it oriented towards professionals in a particular field. Founded by Lois Gibbs following her grassroots activism at Love Canal, CHEJ has evolved into a national environmental justice organization, dedicating much of its resources to providing scientific and organizing assistance to community groups. In this vein, CHEJ should be regarded as being part of the anti-PVC movement by expanding the issue beyond the healthcare or green building industries. Center for Health, Environment, and Justice's seemingly outlier position does not detract from the movement's dominance within these two industries. To a certain extent, CHEJ's efforts coincide with those of HBN and HCWH. The Center for Health, Environment, and Justice is not the only organization of its type involved in the movement, but it is the only one that has prioritized the current politicization of PVC to such a high degree.

The Vinyl Institute is a U.S.-based trade association representing the leading manufacturers of vinyl, vinyl chloride monomer, vinyl additives and modifiers, and vinyl packaging materials. Its mission is “to advocate the responsible manufacture of vinyl resins; life cycle management of vinyl products; and promotion of the value of vinyl to society” (www.vinylinfo.org). The Vinyl Institute represents 8 full members and 14 supporting members, and interacts regularly with other related trade associations, particularly the American Chemistry Council, which represents the Plastics Division and the Chlorine Chemistry Council.

Categorizing these organizations and businesses as the core groups should not be interpreted as a dismissal of the other organizations and public interest groups represented in the periphery and semi-periphery of the movement. These core organizations have the advantage of size and resources, providing them with greater visibility and ability to act. Moreover, all of these except Kaiser Permanente and Catholic Healthcare West, are coalitions or represent multiple parties. Thus, the core groups should be regarded not as single organizations but as representatives of many. It should also be noted that healthcare and green building professionals often act

individually within their respective worksites. As such, their actions towards deselection or challenging PVC's use often go undocumented.

The History of PVC: Political and Economic Context

Two scientists, British chemist Alexander Parks and American chemist Leo Baekeland, are credited with developing the first human-made plastic and the first truly synthetic plastic in 1862 and 1909 respectively (Wilson and Yost 2001). PVC was first produced in a laboratory in 1872 but not commercially produced until 1933 by Union Carbide. Plastics production and use increased substantially in the 1920s and 1930s when a commercial replacement for rubber became needed. The manufacture of PVC accelerated in the U.S., Japan, and Germany during World War II with the expansion of the petrochemical industry and plastics development. The technological boom that followed WWII aided in developing techniques for mixing PVC with plasticizers, creating various applications (Malin and Wilson 1994).

An extensive public relations campaign followed soon after, promoting plastics as materials “that would transform the lives of Americans” and “Better Things for Better Living...through chemistry” (Markowitz and Rosner 2002:139, 140). The American public “opened their arms to the wonders of chemistry” and the “magic of plastics,” where scientists were able to turn monomers into polymers (*Trade Secrets* 2001; interview, Benson). From 1940 to about 2000, the U.S. production of synthetic organic chemicals grew more than thirty-fold (Thornton 2000). The production of PVC alone has doubled over the last 20 years, with 27 million tons of PVC currently produced worldwide each year.

Depending upon whom you ask, the history of vinyl is wrought with suppression of information, cover-ups, and disregard for occupational and public health. In their book, *Deceit and Denial: The Deadly Politics of Industrial Pollution*, historian Gerald Markowitz and historian of public health David Rosner (2002) contend that the plastics and chemical industry misled its workers, the American public, and the federal government about the dangers of vinyl chloride.¹⁰ Markowitz and Rosner reviewed thousands of chemical industry documents prior to writing their exposé on corporate

¹⁰ Vinyl chloride is commonly referred to as VCM (vinyl chloride monomer) in the industry.

misbehavior. They contend that the industry (represented by the Manufacturing Chemists' Association) had learned of a link between vinyl chloride and a previously undefined degenerative bone condition, called acroosteolysis or AOL, in the mid-1960s, yet kept this knowledge from the American people for several years. They further discovered that additional research had been conducted on behalf of European chemical manufacturers at this time on the toxicity of vinyl chloride, confirming its carcinogenicity. Along with European vinyl manufacturers, the American chemical industry entered into secrecy agreements aimed at preventing public disclosure of these findings. According to Markowitz and Rosner, this was due primarily to two reasons. First, the Food Additives Amendment's (1958) Delaney clause banned the use of any suspected carcinogen in any food product. And second, the industry viewed the U.S. political climate ripe for "industrial upheaval via new laws or strict interpretation of pollution and occupational health laws" (p. 182).¹¹

The late 1960s and early 1970s were marked by growth in federal occupational and environmental regulation. This growth accompanied the rise of public environmental awareness stemming, in part, from the 1962 publication of Rachel Carson's *Silent Spring*.¹² While chemical industry representatives maintain that Markowitz misrepresented the Delaney clause (Scranton 2004) in this cultural environment of growing labor, civil rights, and environmental activism, it seems reasonable to expect that the plastics and chemical industries wished to avoid such public scrutiny and associated ramifications, potentially, at all costs. Describing the industry position, Markowitz and Rosner write:

When cancer became an issue, the industry took more extreme and potentially explosive actions to cover up the danger....the industry was largely successful in hiding its information about cancer from the government and in deflecting national attention away

¹¹ A Manufacturing Chemists' Association document revealed significant concern over bad publicity and appeals to undertake any necessary efforts "to avoid exposures like *Silent Spring* and *Unsafe at Any Speed*" (Markowitz and Rosner 2002:175).

¹² During this time major government agencies and legislation were established and passed; including: Coal Mine Safety and Health Act (1969), National Environmental Policy Act (1969), Environmental Protection Agency (1970), Occupational Safety and Health Administration (1970), National Institute for Occupational Safety and Health (1970), Clean Air Act (1970), Water Pollution Control Act (1972), Pesticides Act (1973) and the Endangered Species Act (1973).

from the potential hazards of thousands of mostly untested new chemicals and of vinyl chloride in particular (p. 178).

Cancer concerns materialized in 1974 when the American public learned that four PVC workers exposed to vinyl chloride died from angiosarcoma (ASL), a rare form of cancer of the liver. According to Markowitz and Rosner (2002), this cancer was “identical to that seen in the European rat feeding studies” conducted in Italy that linked VCM to cancer and about which the industry had failed to inform the National Institute for Occupational Safety and Health (NIOSH) (p. 192). As Markowitz and Rosner see it, the sole aim of industry secrecy agreements “was to avoid a public relations and legal nightmare” (p. 183). Public knowledge regarding a link between vinyl chloride monomer and cancer could result in a significant market effect. While workers’ compensation laws generally insulated the industry from severe financial loss from workers, the possibility of consumer lawsuits was of great concern. In particular, prior to 1974, vinyl chloride had seen widespread use as an aerosol propellant for drugs, pesticides, paints, and hairspray. However, rather than risk liability and inform consumers about the dangers of vinyl chloride, manufacturers began quietly replacing vinyl chloride in its aerosol propellants. And, instead of complying with a NIOSH request for information, the industry decided to minimize the seriousness of occupational and public health risks from vinyl chloride exposure. They did not tell NIOSH about the Italian studies, and they did not tell them about their data indicating that the threshold limit should be dramatically reduced.

Markowitz and Rosner’s (2002) account is greatly disputed by the vinyl and chemical industries – particularly the question of what they knew and when they knew it. The controversy over publication of their book and subsequent appearance on a PBS documentary, *Trade Secrets* (2001) with Bill Moyers, will be discussed in greater detail in chapter four. The vinyl representatives I interviewed would not comment extensively on the industry’s history, but what they did disclose contrasts significantly with Markowitz and Rosner’s account. In my interview, the representatives acknowledged that this was a sad chapter in their industry’s history, but maintained that vinyl chloride

was considered innocuous at the time and not harmful. As of July 4, 2007, the Vinyl Institute's website states:

There also is a commitment to responsible manufacturing practices and a determination to make sure that vinyl is appropriate and safe for the products in which it is used. *This commitment is perhaps best exemplified by the effort the industry undertook in the early 1970s*, when it was discovered that workers in vinyl polymerization plants who had prolonged, extremely high exposures to vinyl chloride monomer, the raw material used to make vinyl, were at risk for developing angiosarcoma of the liver, a rare form of cancer [emphasis, mine].

On the other hand, Markowitz and Rosner cite B.F. Goodrich and Union Carbide documents dating from 1959 that indicate otherwise:

...We feel quite confident that 500 parts per million is going to produce rather appreciable injury when inhaled 7 hours a day, five days a week for an extended injury....*and*....Vinyl chloride monomer is more toxic than has been believed (B.F. Goodrich document and Union Carbide document, Trade Secrets).¹³

As described to me by the vinyl representatives, during polymerization of vinyl chloride, big vats would “cake up” but there were no acute health effects. A medical doctor out of B.F. Goodrich in Kentucky recognized the link between vinyl chloride and angiosarcoma.¹⁴ In our interview, one of the vinyl industry representatives made a point of mentioning both that ASL does occur naturally (although adding “rarely” as a clarifier), and that high doses of vinyl chloride are required for an exposed worker to develop the disease. Once this link was realized, the OSHA responded and lowered vinyl chloride workplace Permissible Exposure Limits from 500 parts per million to 1 part per million. Within eighteen months, industry realized they had to change how they did business and they began sharing information worldwide (although primarily with Europe), to lower exposure to vinyl chloride monomer. However, OSHA imposed this decision and employer compliance was legally required. But, as the interviewee asked, “Why would you want to fight that? No one with a conscience would expose workers to cancer.” He recognized that threshold level values were a point of debate, with some stakeholders maintaining that there is no safe level for exposure. However, he emphasized, “*regulators* think you can create safe levels.” By implying that there is no

¹³ At the time, workers were regularly exposed to 500 parts per million of vinyl chloride (Trade Secrets).

need for concern, he added, “Everybody in industry”—before clarifying—“in general, *everyone* can sleep soundly at night [he] hopes.”

A Lifecycle of Harm: Toxicity and Health Threats

The degree to which (or even *if*) PVC is harmful is at the heart of the debates surrounding its continued use. Some of the health and environmental problems are associated with a particular stage in the lifecycle, while others are potentially problematic at multiple points, such as during production and disposal. Arguably, PVC first emerged in the socio-political limelight several decades ago when production workers were exposed to excessively high levels of vinyl chloride and became ill and/or died. In the U.S., documentation of certain occupational related illnesses have dropped along with vinyl chloride monomer threshold limit values (now one part per million). As the political economic climate has shifted, so have the debates. Some problems may have diminished, but others have emerged. To understand current debates, it is useful to identify the occupational and environmental health problems as they relate to the history of industry and current use of PVC. Outlining the most prominent health and environmental problems helps set the stage for understanding how different stakeholders define and frame their concerns. This is particularly useful, given that different stakeholders politicize different aspects of PVC.

Production

The manufacture of PVC accounts for the production of many unintended, toxic byproducts. Like the majority of plastics, fossil fuels are the primary feedstocks necessary for production. PVC is the least consumptive mainstream plastic of fossil fuels; however, this is because approximately 40% of its content is derived from chlorine, a natural element accounting for much of the contention surrounding PVC’s use. PVC manufacture would not be possible without chlorine chemistry. At each stage of PVC production, organochlorines (carbon-based chemicals) are formed and released into the

¹⁴ A private practice physician who conducted physical exams of the Goodrich’s employees did discover acroosteolysis in workers, but not angiosarcoma. While this may have been an honest error on the part of the interviewee, it is noteworthy that the industry’s representatives did not accurately remember the industry’s history.

environment (Thornton 2000). Organochlorines are toxic, persistent in the environment, bioaccumulative (concentrate in the fatty tissues of organisms), and contaminate “absolutely every inch of the planet” (Thornton 2000:5, 25).¹⁵ Organochlorine exposure is increasingly being linked to different kinds of cancer, immune suppression, infertility, and development problems. Because over 10,000 organochlorines are produced by the chemical industry, the impacts of PVC as an organochlorine-containing material become magnified and contribute to one of the greatest threats to environmental and human health.

PVC’s heavy reliance on chlorine for production positions it not only as the only major plastic that contains chlorine, but also as the largest user of chlorine in the world (Thornton 2000). The generation of dioxin, a persistent, carcinogenic chemical, is an unintended but unavoidable by-product whenever chlorine-based chemicals are produced, used, or burned, as in the manufacture and the disposal of PVC. Dioxins have been linked to breast cancer, lower sperm counts, and reproductive-related birth defects in men. According to Greenpeace, throughout its entire lifecycle, “PVC is responsible for a greater share of the nation’s annual dioxin burden than any other industrial product” (www.greenpeaceusa.org).

Because dioxin bioaccumulates, traveling up the food chain, the food supply is the major source of contamination. Human exposure to dioxin through the food supply appears relatively consistent throughout the population, except for locally caught or harvested foods in especially contaminated regions (Institute of Medicine 2003). Most significantly, this impacts subsistence fishers, American Indian, and Alaska Native tribes who rely on fish and wildlife in greater quantities than the general population. The health and development of children are also at risk, as will be discussed further below. Dioxin is able to travel long distances. As an example, even animals in the arctic, particularly at the top of the food chain, are at a significantly high risk for contamination.

Before dioxin makes its way into the fatty tissues of a polar bear, it must first be ‘produced’ where it is part of a process that potentially causes a multitude of health

¹⁵ Those organochlorines that do breakdown in the environment often result in other, more persistent and potentially more toxic byproducts (Thornton 2000).

problems for humans. As of 2007, there remained eight chlor-alkali facilities in the United States that relied on mercury to produce the chlorine needed for PVC production, releasing an unaccounted for level of mercury emissions each year (www.nrdc.org). PVC is produced by the conversion of ethylene dichloride (EDC) into vinyl chloride monomer (VCM), which is then polymerized to form PVC.¹⁶ The conversion of EDC to vinyl chloride generates hydrochloric acid, a by-product with corrosive properties causing irritation and burns, or potentially more serious health problems if exposure is more severe (ASTDR 2007). While EDC is not particularly persistent, large quantities of persistent bioaccumulative by-products are produced by the synthesis of EDC and VCM (Thornton 2000). This synthesis generates a substantial amount of chemical waste, PCBs, dioxins, and furans.

As one of the best-studied chemicals (Kielhorn et al. 2000), vinyl chloride's hazards are well documented. Vinyl chloride is listed as a known carcinogen by the U.S. Department of Health and Human Services and the World Health Organization's International Agency for Research on Cancer (IARC). Even short-term exposure to VCM involves a fatal risk if levels are high enough.¹⁷ Vinyl chloride has been found in at least 616 of the 1,662 National Priority List sites identified by the Environmental Protection Agency (EPA) (ASTDR 2006). Ninety-eight percent of the vinyl chloride produced is used to make PVC. Human health risks from vinyl chloride are mostly occupational; however public health risks are greatest for communities in close proximity

¹⁶The polymerization process occurs through four stages: First, salt (sodium chloride) is broken down through an electrolytic process to release chlorine as a greenish gas....In the second stage, chlorine, is combined with a variety of hydrocarbons to produce vinyl chloride monomer....In the third stage, the monomer is formed into a polyvinyl chloride resin. In the fourth stage, it is fabricated into finished products (Markowitz and Rosner 2002:169-170).

¹⁷According to the U.S. Agency for Toxic Substances and Disease Registry (ASTDR), among the risks associated with breathing high levels of vinyl chloride for short periods of time include; dizziness, sleepiness, and unconsciousness. Breathing vinyl chloride for long periods of time involves the same risks (including death) but can result in permanent liver damage, immune reactions, nerve damage, and liver cancer. Studies in workers who have breathed vinyl chloride over many years showed an increased risk of liver, brain, lung cancer, and some cancers of the blood have also been observed in workers. Animal studies have shown that long-term exposure to vinyl chloride can damage the sperm and testes. (Department of Health and Human Services, ASTDR, ToxFAQs for Vinyl Chloride, July 2006).

to vinyl chloride production facilities and in the vicinity of hazardous waste sites and municipal landfills. Tobacco smoke also contains a low level of vinyl chloride (ATSDR 2006). The route of exposure may be air or soil where it is “highly mobile” and as a consequence is sometimes detected at levels higher than EPA standards for groundwater and drinking water (ASTDR 2006). Until the early 1990s, traces of vinyl chloride remained in PVC, leaching the carcinogen into food and water from PVC containers. This risk remains included on the ASTDR’s latest Vinyl Chloride Toxicological Profile (2006).

In the United States, PVC plants are mainly located in Louisiana and Texas, where the petrochemical industry enjoys prominence. These plants are located in largely African-American and low-income communities where there is risk from air pollution and contamination of their groundwater from the vinyl production facilities. Large-scale releases of vinyl chloride may occur from operator error or whenever a power failure requires immediate termination of the polymerization process (Malin and Wilson 1994). In the 1980s the groundwater of the small African-American town of Reveilletown, Louisiana, was contaminated and ultimately relocated after a plume of vinyl chloride was inadvertently released from the nearby Georgia-Gulf PVC plant. Major vinyl chloride spills have occurred elsewhere in Louisiana, as well as in Pennsylvania and Texas. Mossville, Calcasieu Parish, Louisiana may be among the most notable examples of environmental injustice. This parish is home to a total of 14 industrial facilities, including chemical companies, an oil refinery, a coal-fired power plant, and more vinyl manufacturers than any other in the United States (Mossville Environmental Action Now, Inc. et al. N.d.). In 2005, the public-interest law firm Advocates for Environmental Human Rights took the novel approach of filing a petition on behalf of Mossville residents with the Inter-American Commission on Human Rights of the Organization of American States, charging that the environmental situation interferes “with fundamental human rights to: life, health and a clean and ecologically secure environment; privacy as it relates to the inviolability of the home; equality; and freedom from discrimination” (Walsh 2005c).

Occupational health risks for PVC production workers are relatively well documented (Lee et al. 1988; Cheng et al. 1999; Langard et al. 2000; Mundt et al. 2000; Yadav and Chhillar 2001; Lewis et al. 2003). The point of production is among the most hazardous for workers, but as the first stage of the PVC lifecycle only marks the beginning of opportunities for public health risks. During production, exposure to PVC has been known to cause acroosteolysis (absorption of bone of the terminal joints of the hands and circulatory changes), Raynaud's phenomenon, and angiosarcoma of the liver (ASL) among workers. Lowered Permissible Exposure Limits (PELs) for vinyl chloride have greatly reduced the number of new cases of ASL; however, given ASL's latency period of approximately 20 years, new cases of ASL caused by vinyl chloride exposure may continue to emerge among former workers or their children. This may be a particular risk for workers exposed to vinyl chloride in countries where the manufacturing process is outdated or vinyl chloride is not regulated (Kielhorn 2000). For instance, in 2004, Taiwanese researchers found that there was an increased risk of developing liver fibrosis in PVC workers who had high exposure to vinyl chloride monomer (*Telemedicine Week* 2004).

Use

PVC production generates concern in its own right; however, PVC resin alone is not very useful; additives and stabilizers are added to the plastic during the production process (compounding) to create the desired properties. PVC end-products are commonly comprised of only about 70% PVC resin, and sometimes as little as 35% or 40% (Malin and Wilson 1994). These additives create additional health risks and contribute to the risks associated with the middle stage of PVC's lifecycle. The most common additives are plasticizers, chemicals used to give PVC its flexibility. Plasticizers reduce PVC's inherent (chlorine-based) fire resistance, making it necessary to add fire-retardants as well (Malin and Wilson 1994). Stabilizers are added to PVC to reduce degradation caused primarily from heat or ultraviolet light (Malin and Wilson 1994). Heavy metals, such as cadmium and lead, have traditionally been used as PVC stabilizers. While their use has been declining in the U.S., there are some applications where alternative materials are either not available or not preferable. In recent years,

imported vinyl products, including children's lunchboxes and miniblinds, have been found to contain potentially hazardous levels of lead. The plasticizers or added stabilizers can leach, causing brittleness, or outgas, from the PVC, thus inhibiting performance and risking contamination (particularly of concern when used in medical products). In current PVC debates, because of additive and stabilizer concerns, the use stage of PVC has emerged as much more controversial than the production stage, especially within the health care branch of the movement.

Phthalates are the most common plasticizer and are used in the manufacture of household, consumer, and medical products. Phthalates are a family of industrial chemicals used as softeners in PVC plastic (toys, vinyl shower curtains, car seats, wallpaper, etc.) and as solvents in cosmetics and other products (www.hcwh.org). Phthalates have been linked to birth defects, organ damage, infertility, cancer, and liver, lung, and kidney damage (*Ecologist* 2003). The most used, studied, and politicized, phthalate is di(2-ethylhexyl) phthalate (DEHP).¹⁸ DEHP is added to medical devices, including intravenous (IV) bags, tubing, and catheters to soften the PVC and make the plastic more pliable. Plasticizers are not covalently bound to the polymer and factors such as temperature, pressure, storage time, contact with fluids, and flow rates can influence the leakage of DEHP from PVC into fluids such as blood and saline solution (Danschutter et al. 2007).

Since DEHP is not chemically bound to PVC, concerns of leakage from intravenous and other medical bags and devices surround its use. DEHP is the only plasticizer approved by the FDA for medical use (Danschutter et al. 2007). DEHP is a reproductive toxicant, and animal studies have linked DEHP with reproductive and developmental toxicity (Shea and Committee on Public Health 2003). The most vulnerable populations include infants and toddlers, particularly males, pregnant and lactating women, and patients undergoing certain medical procedures. According to the Department of Health & Human Services, Food and Drug Administration (2002), the male fetus, male neonate, and peripubertal males appear to be the highest-risk groups of

¹⁸ DEHP is a colorless oil used in high concentrations (20% to 50%) in medical devices to soften PVC (Danschutter et al. 2007).

patients.¹⁹ Animal studies indicate that DEHP may adversely affect male reproductive tract development, particularly the developing testes (Shaner and Botter 2003).²⁰ Male neonates treated in neonatal intensive care units (NICUs) are especially at risk for reproductive development problems. They may spend several weeks or more in an NICU, where they absorb high doses of DEHP via ingestion, intravenous, and dermal absorption (Calafat et al. 2004). Because risk to humans must be extrapolated from animal studies, DEHP has emerged as one of main controversies surrounding PVC's use within the medical community (Shea and Committee on Public Health 2003).

There may be additional reasons for concern. A 2007 study in a pediatrics intensive care unit suggested that there may be a relationship between DEHP plasticized PVC intravenous tubing sets and deep venous thrombosis (DVT), a rare, but potentially dangerous medical condition in children (Danschutter et al. 2007). The researchers' experiments "strongly suggest" that an appreciable number of patients, both in the pediatric intensive care unit and throughout the hospital, to be intravenously injected with DEHP plasticized particles. These same researchers observe, "It is also remarkable that since plasticized products became ubiquitous in the developed world, asthma and allergies evolved to the status of major health problems. Evidence now reveals that, besides lifestyle and demographic factors, asthma and certain allergies can reflect a biological response to phthalates and especially DEHP" (p. e751).

Disposal

At the end of its lifecycle, PVC is dumped into a landfill, incinerated or otherwise burned, or recycled. PVC products that wind up in landfills contribute to the contamination of groundwater through the leaching of toxic fluids. Communities may be harmed not only by PVC contamination of groundwater, soil, aquifers, and wells, but also

¹⁹ The Department of Health & Human Services lists the following as posing the highest risk of exposure to DEHP: exchange transfusion in neonates, extracorporeal membrane oxygenation (ECMO) in neonates, total Parenteral Nutrition in neonates (with lipids in PVC bag), multiple procedures in sick neonates (high cumulative exposure), hemodialysis in peripubertal males, hemodialysis in pregnant or lactating women, enteral nutrition in neonates and adults, heart transplantation or coronary artery bypass graft surgery, massive infusion of blood into a trauma patient, and transfusion in adults undergoing ECMO (2002).

²⁰ In Europe, where the use of phthalates is more controversial, the market for DEHP has fallen since 2000 (Waldman 2005).

by the emission of toxics into the atmosphere. The most notable of the numerous health and environmental problems associated with PVC disposal is dioxin, released through the burning of PVC products. As previously indicated, dioxin is not safe at any level, “disrupting biological reproduction, development, and immunity” even at miniscule exposures (Hoffman 2003:135).

The EPA has determined that incineration of municipal and medical wastes are the dominant known sources of dioxin in the United States (Thornton 2000). In addition to dioxin, other additives, including lead are also released. Lead cannot be destroyed by incineration, leading Thornton to conclude that vinyl is a major cause of lead pollution (Thornton 2000). Beyond what is purposively incinerated, one of the major PVC controversies concerns how much PVC is burned and its potential toxicity. In particular, disputes center around the frequency and toxicity of open or backyard burning and landfill fires. These conflicts and their significance are discussed in greater detail in Chapter 5, *Building Political Opposition to PVC: Case Study, Green Building and PVC*.

As an occupational group, firefighters likely face the most significant occupational hazards as a result of the predominance of PVC in construction and the household, and the well-documented risks associated with burning it. Any fire may be potentially dangerous to firefighters; however, exposure to carcinogenic chemicals increases the risk of various cancers, respiratory problems, and other health concerns. At low temperatures, even before PVC ignites, it releases deadly gases, such as hydrogen chloride. As reported in Environmental Building News (1994), “No one disputes that hydrochloric acid and a wide range of other toxics are released when PVC burns. Just how much hydrochloric acid humans can breathe without injury is hotly debated, however” (Malin and Wilson 1994). At high temperatures, benzene, toluene, formaldehyde, chloroform, chlorinated biphenyls, dioxins and dibenzofurans are released (Wallace 1990:12). According to Deborah Wallace (1990), author of *In the Mouth of the Dragon: Toxic Fires in the Age of Plastics*, the emission of carcinogens appear to explain the high frequencies of leukemia, laryngeal, colon, and soft tissue cancers diagnosed in many young firefighters.

The widespread use of synthetic plastics and PVC in building materials and interior furnishings contributes to hotter burning fires and denser smoke (Giarrizzo 1990). According to Giarrizzo, there are 43 known or suspected carcinogens in smoke from synthetic plastic alone. Many of these hazardous chemicals remain at fire scenes even after a fire has been extinguished and the area has cooled (Winney 1996). Firefighters may inhale, absorb, and ingest carcinogenic agents. Their gear may inefficiently protect them from exposure, particularly to hazardous materials. The expense of special suits designed for toxic chemical spills prohibits many municipalities from providing them for their firefighters. Moreover, anyone (or anything) who comes in contact with the gear worn by firefighters becomes exposed to these toxics, creating cross-contamination.

Recycling PVC is difficult, or even impossible according to some opponents. PVC opponents argue that recycling poses additional end-of-life health and environmental concerns. PVC burns at much lower temperatures than other commonly recycled plastics (particularly polyethylene terephthalate [PET]), often ruining recycling batches and risking equipment damage (Malin and Wilson 1994). The additives used in different combinations for various applications also complicate PVC recycling. For this reason, recycled PVC products may be more accurately called ‘downcycled’ products, since the new PVC product is always of lower quality than the original material (Thornton 2000). Thornton thus surmises that “downcycling does not reduce the amount of PVC produced each year or the total quantity of PVC building up on the planet” (p. 316).

Contemporary Position of Government Agencies

“Improving the health and well-being of America”

(U.S. Department of Health & Human Services slogan)

Despite a growing body of evidence, including some of their own reports, the response of the federal government agencies has been to issue warnings, resolutions, and public health notifications. While many of these suggest and encourage avoidance of certain PVC products or the development of alternative products, none of these require change; they only encourage voluntary compliance for manufacturers and hospitals. Multiple factors influence the decisions and actions taken by government agencies;

budget uncertainty, agenda changes based on who is in office, and stakeholder pressure to name a few. Of key concern to occupational and environmental health advocates is well-funded, organized industry opposition to their issues. The role of the state is to regulate; however, industry and economic influences over state decisions have serious health and environmental consequences. In their discussion of the political economy of the work environment, Levenstein and Tuminaro (1997) point out that “limits to regulation are imposed...by the imperatives of the capitalist firm,” adding that it is unclear how far those limits can be pushed (p. 14).

Part of the problem is also the compartmentalization and fragmentation of government oversight. There are numerous federal, state, and local agencies that deal with environmental, occupational, and public health protection, regulation, and enforcement. And within these there may be multiple separate and distinct bodies or offices responsible for addressing problems that are interrelated, such as water quality, air pollution, and waste management. If just considering federal agencies that address some aspect of PVC production, use, or disposal, at minimum, you would have to include; Occupational Safety and Health Administration, Consumer Products Safety Commission, the Environmental Protection Agency, and the Department of Health and Human Services (including the Agency for Toxic Substances and Disease Registry, and the Food and Drug Administration).

In *Toxic Deception*, Fagin and Lavelle (1994) explain that chemicals are not screened for safety before they go on the market because “for the most part...the chemical industry was a firmly entrenched economic and political force by the time Congress was moved to do something to protect the public from hazardous compounds in the 1970s” (p. 10). Consequently, industry economic interests were able to greatly influence and weaken environmental protection laws. As an important example, this influence became even further entrenched in law with the passage of the Toxic Substances Control Act in 1976 (TSCA). According to Fagin and Lavelle, in effect TSCA established a policy whereby chemicals were treated as safe until they were a ‘proven’ risk and thus allowed to stay on the market. TSCA’s language favored industry by requiring that the EPA weigh potential costs to industry against the benefits of its

decisions. When combined with the EPA's reliance on chemical manufacturers' studies for data, and allowance for protection of 'trade secrets,' the cards certainly seem stacked against public safety.

In the early 1970s, following the establishment of the Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), and the Environmental Protection Agency (EPA), national awareness regarding public and occupational health and industrial hygiene was high. However, the vinyl industry was vigilant in its efforts to avoid public disclosure of the hazards of vinyl chloride (VC). Although evidence suggests these hazards were already well known within the industry by this time, the vinyl industry worked diligently to protect its image and market (see Markowitz and Rosner 2002). The public relations arm of the industry remains at work. The dominant strategy appears to revolve around confronting directed assaults, although during the last two decades, the plastics and chemical industries have mounted several large public campaigns. There appears to be a general lack of public awareness regarding the hazards of PVC. However, this is not the case for activists and advocates in the health care community and green building industry. In the next chapter I examine the social movements that have emerged to challenge PVC's use.

CHAPTER III
PUSHING THE BOUNDARIES OF HEALTH AND SOCIAL MOVEMENT
THEORY: THE ANTI-PVC MOVEMENT

The anti-PVC movement is a norm-oriented social movement (Smelser 1962) in that concerns are directed towards producing limited, but specific changes such as identifying and using PVC alternatives, rather than seeking value-driven transformative societal change that is more revolutionary in scope. The anti-PVC movement does not adhere to the “prevailing definition of movements as political phenomena [which] has led scholars to focus primarily on a movement’s political environment” (Taylor 2000b:221). Instead, as Taylor suggests, we should think in broader terms for understanding how power is exercised and protested in complex societies where the “sites of collective action have expanded beyond the state...” (p. 224). While the anti-PVC movement shares some of the characteristics common to traditional understandings of social movements, such as collective or joint action, change-oriented goals, some degree of organization, temporal continuity, and some extra-institutional collective action and institutional activity (McAdam and Snow 1997), for the most part, the anti-PVC movement is not a ‘traditional’ protest movement, lacking such hallmarks as direct action, mass mobilization, or even moderate political lobbying.¹

On first glance, the anti-PVC movement may be more appropriately regarded as a “new social movement” as it is dominated by a professional middle-class of ‘non-self-interested actors’ (Rose 1997:469). However, New Social Movement (NSM) theorists contend that these movements are a response to new developments in the organization of capital. This characteristic of NSMs is not shared by the anti-PVC movement, which actually seeks to address concerns about PVC through use of the capitalist system (specifically, by promoting market change) rather than pose any direct challenge to the capitalist system itself. Moreover, while the anti-PVC movement is clearly shaped by the

¹ The health care industry is more likely than the green building industry to engage in political activity.

class position of its participants, the movement cannot accurately be described by New Class theories (see Rose 1997; Scambler and Kelleher 2006) either, in that the anti-PVC movement is not emphasizing the advancement or pursuit of class interests. Instead, the anti-PVC movement should be regarded as a primarily occupationally-driven movement, largely comprised of architects, builders, environmental health activists, nurses, and other healthcare professionals.

Calling for the phase-out or elimination of PVC can be understood as major, but specific objectives within other, broader social movements. Issues related to the use of PVC have emerged within the context of the green building movement and also as part of a health social movement. In this sense, there are two main branches of the anti-PVC movement.² These branches share at least two traits that impart an element of distinctiveness to the anti-PVC movement, particularly when they are considered in conjunction with one another. One, anti-PVC activists seek change by working within the health care and green building industries through targeting decision-making leaders, manufacturers, suppliers, and other professionals. Two, the protagonists, individuals and organizations that either support or benefit from the movement in the both branches of the movement are predominately either professionals within these industries or advocacy organizations with strong ties to health care and green building. These two traits are developed in the following sections.

Target of the Movement

Unlike many other social movements, the anti-PVC movement is not specifically directed at the state or its policies and most of those who are involved in the movement do not “conceive of themselves as outside of and opposed to institutions” (Tarrow 1994:25). The involvement of both health care and green building businesses establishes the movement as *within* the system rather than mobilizing *against* the system. These organizations do not seek to challenge the political (or economic) system through protest or disruption. Instead, the approach within both the green building and healthcare sector

² Unless I specify otherwise, when I refer to the anti-PVC movement I am referring to both the healthcare and green building branches of the movement. Similarly, any references to ‘the movement’ should be understood to mean the anti-PVC movement.

is two-fold: promoting market change and education about PVC within their respective industries. With regard to the former, activism by these organizations within the core is primarily aimed at transforming the market via pressure on the consumers, users, sellers, and producers of PVC products, towards the use and production of alternative materials.

Part of this emphasis on market change involves dimensions of what Hess (2005) terms technology-oriented and product-oriented movements (TPMs). TPMs “are mobilizations of civil society organizations that generally are also linked to the activity of private-sector firms, for which the target of social change is support for an alternative technology and/or product as well as the policies with which they are associated” (p. 516).³ One strategy of the anti-PVC movement, particularly manifest in the health care industry, is the push for alternatives to DEHP containing PVC IV bags. According to Hess, while TPMs are distinct in their means of social change, they may nonetheless occur in conjunction within broader social movements. Like the anti-PVC movement, TPMs include nonprofit and advocacy organizations, and networks of occupational, research or industrial organizations. The applicability of Hess’s conceptualization of TPMs to the anti-PVC movement is strongest in his first of three hypotheses of processes, the “private-sector symbiosis,” where a “cooperative relationship emerges between advocacy organizations that support the alternative technologies/products and private-sector firms that develop and market alternative technologies” (p. 516). As I discuss elsewhere in this chapter, Health Care Without Harm and Catholic Healthcare West formed a cooperative relationship to encourage Baxter, one of the largest medical device producers, to develop a non-PVC IV bag. Baxter initially consented to the challenge but ultimately the company reneged on its commitment.

Instead, B. Braun, a much smaller medical supplies producer, met CHW’s PVC/DEHP-free IV bag needs. According to Hess’s second hypothesis, “incorporation

³ Hess distinguishes ‘technology’ from ‘products’ with the former meaning “material objects that are intentionally used to modify the social and/or material world” and the latter defined as “capital or consumer goods that are sold in markets” (p. 518). In my application of Hess’s TPMs to the anti-PVC movement, I am largely concerned with PVC products rather than technologies as that reflects the primary concerns of those in the movement.

and transformation,” typically, established industries will tend to subsume the innovations of the TPMs, redesigning the technologies and products such that they are “more consistent with existing technologies and with corporate profitability concerns” (p. 516). Predictably, when they could no longer afford to ignore the demand for alternatives, the two largest medical supply producers, Baxter and Hospira, introduced their own lines of PVC/DEHP free IV lines. However, incorporation and transformation is of less concern to the anti-PVC movement than Hess found to be the case for other social movements. Activists are not mounting epistemic challenges to medical knowledge; however, as the movement to green health care develops, it is possible that market battles that play out among medical suppliers will influence the direction of the movement. Within green building, it is feared that the vinyl industry has coopted not the innovations of the TPM current of the anti-PVC movement, but taken their argument about PVC environmental and health safety concerns and flipped it to argue precisely for the “greenness” of the product. In other words, the vinyl industry maintains that vinyl products are environmentally friendly and there is no need to develop alternative products to them.

According to Hess’s third hypothesis of “object conflicts,” product diversification follows the process of incorporation and transformation, leading to conflicts among various movement stakeholders. Hess states, “the design choices between different variations of similar objects [e.g., PVC IV bags or other PVC products] become sites for conflict among the range of organizational and individual actors that develop from SMs to established industries” (p. 520). The PVC free lines produced and marketed by both Baxter and Hospira are limited; thus object conflicts have not yet emerged as central to the PVC debates in health care. Both companies have not fully committing to phasing out PVC medical products. They continue to produce PVC IV bags, rather than coopting the design of B. Braun’s product line. Instead, they produce a niche product to respond to the anti-PVC movement’s successful demands for a market shift. Within green building, there is tremendous debate regarding which materials (if any) have been established as safe and would serve as acceptable alternatives to the PVC materials

currently used in building construction and design. Disputes have been especially contentious with regard to a possible PVC avoidance credit in green construction through the U.S. Green Building Council's green rating system, as will be discussed in detail in chapter six.

Educational objectives serve as the second target of the movement. The focus of the anti-PVC movement is not on generating broad public awareness or recruiting members, rather it is to share information among green builders and healthcare workers. Reflecting the professional or class status of the movement participants, activists work to convince others in their field of the ecological or health importance and cost of deselecting or not using PVC.⁴ Hence, the protagonists and adherents in the green building and health care branches of the movement direct their educational efforts primarily within their respective industries. Adherents are most active in the movement and represent the core protagonists (McAdam and Snow 1997). As Rose (1997) noted in his class-cultural theory of social movements, professional middle-class social movements "tend to see change as a process of education about values" (p. 478). This accurately describes anti-PVC green builders who seek to influence other professionals, such as architects and developers to deselect PVC, as well as anti-PVC health care activists who try to persuade and educate nurses, hospitals, and suppliers to either use or offer PVC-free medical devices. The main exception on both accounts is the Center for Environment, Health, and Justice and to a currently less-involved degree, Greenpeace, whose anti-PVC campaigns reach out to a broader base of support.

Like some environmental and public health movements, the health beneficiaries of the movement are not the actors themselves, but are an unknown population. As previously stated, certain populations are at greater risk for dioxin contamination, but no individual or community is protected from dioxin exposure. Movement participants are acting on behalf of a perceived threat rather than on behalf of or as part of a particular at-risk constituency. These 'conscience adherents' (McCarthy and Zald 1977) are supportive of the movement but will not be direct beneficiaries if the movement

⁴ In health care, the cost between PVC IV bags and non-PVC IV bags are roughly equivalent. In green building, non-PVC materials are substantially more affordable for some applications.

succeeds. In the case of intravenous DEHP exposure, anti-PVC health adherents are acting on behalf of those populations most vulnerable to harm; however, such action arises out of a collective concern for these larger groups at risk, rather than out of concern for a specifically known patient population. In other words, no contingency of parents of male neonates, pregnant or lactating women, or others identified as the highest risk groups have emerged either as an exposed group seeking redress or as calling for PVC/DEHP IV phase-outs. Thus, there is no experiential knowledge base from which to draw. As such, the individual beneficiaries of the movement remain largely unknown to the movement adherents.

In contrast, it is important to note that those businesses involved in the anti-PVC movement *are* very likely to be a beneficiary constituency. By being able to promote themselves as “green” (both for builders and healthcare organizations), these organizations and businesses will potentially profit from the positive economic returns associated with favorable press and public opinion. However, not all hospitals and healthcare facilities promote the fact that they have eliminated some PVC products even after they have done so. Moreover, “green” can be, and is, described in various ways by different stakeholders. It is not a certainty that being PVC-free will resonate in importance with the public. If economic interests were the sole motivator for these businesses, it may make more sense for them to advance a “green image” using a less controversial and less elusive environment and health problem, or to wait until the contentiousness of some of the debates had subsided before electing to phase-out PVC. This is not to dismiss the argument that these interest groups are involved for their own self-interest; however, in my asking the question, “*Why has PVC become politicized?*” I sought to determine the manifest reasons that these organizations gave in addition to latent reasons that might also be true.

Actors in the Movement

Social movement literature inadequately examines social movements sharing similar characteristics to the anti-PVC movement with regard to movement targets and professionals as protagonists. By ‘professionals’ I mean members of occupational

groups, generally middle-class, characterized by a high level of technical and intellectual expertise, and autonomy in recruitment and discipline (see Friedson 1970, chap. 9). Rose (1997) describes the professional middle class as “distinguished by higher education and broad flexibility in the work process, while still lacking control over the products of labor” (p. 477). This section addresses the role of professionals as actors in the anti-PVC movement, professionals as scientific and medical activists, and the role of coalitions and advocacy organizations in the movement.

Research has been conducted on the professionalization of movements (see McCarthy and Zald 1977; Piven and Cloward 1977; Staggenborg 1988), but less on professionals in movements, excepting those movements theorized within the framework of New Social Movements. This makes sense, of course, given that social movements often emerge to represent those with fewer financial resources and political opportunities. Professionals are more accurately regarded as those in decision-making positions and as part of the dominant power structure, rather than as a disadvantaged group seeking to rectify an injustice. However, there is increasing activism on the part of professionals, particularly scientists, who have joined as supporters and participants in environmental health and justice struggles. The influence of these “scientific advocates” or “expert-activists” may have important implications for policymaking, community health, or environmental impacts. Increasing literature on boundary movements, lay-scientific interactions (particularly within the breast cancer movement) and even science-oriented organizations helps to document the collaboration between professionals and lay people, citizen-scientists, or community organizations (see McCormick, Brown, and Zavestoski 2003; Frickell 2004). This research is relevant, but not adequate, for understanding the involvement of ‘professional advocates’ in the anti-PVC movement. Scholarly examination of ‘the professional’ is almost exclusively located within the ecological and environmental health science disciplines (Frickell 2004). Focus is primarily on activist scientists challenging the prevailing use or interpretation of science, giving voice to scientists, or assisting or advising community organizations.

Scientific and Medical Activism

In Frickell's (2004) examination of scientific activism in the U.S. environmental justice movement, he identifies four science-oriented organization types; environmental boundary organizations, scientific associations, public interest science organizations, and grassroots support organizations. All four have relevance for the anti-PVC movement, particularly public interest science organizations (e.g., Physicians for Social Responsibility) and grassroots support organizations (e.g., Center for Health, Environment, and Justice). However, overall, the anti-PVC movement is comprised of a wide range of professionals not represented in the scientific activism literature. They may serve similar roles to grassroots support organizations (GSOs) as described by Frickell. GSOs are staffed by professional activists and volunteers, not professional scientists, and connect citizens' groups to the broader movement infrastructure. However, unlike GSOs, the anti-PVC protagonists' goals are not about contesting the credibility of industry and government claims over "maintaining the credibility of science" or addressing the "extreme imbalances of power" (p. 462). In fact, many of the professionals in the anti-PVC movement do not overtly challenge government claims or attend to the hierarchy of power relations between those most at risk from PVC related environmental health threats, themselves, and government or industry.

The involvement of scientists varies from organization to organization within the anti-PVC movement, but nonetheless tends to follow the pattern Frickell (2004) describes as "intermittent and tailored to specific context-dependent task[s]" (p. 463). Generally, these contributions have included writing or technical assistance for reports and/or submitting comments (such as for the United States Green Building Council) or providing technical advisement at roundtables or conference presentations (e.g., Health Care Without Harm, Oregon Center for Environmental Health). Frickell's research is an important starting point for understanding scientific professional activism, but with its focus on scientists only, it is limited in its ability to explain the professional activism of those non-scientists who are also distinguished by professional credibility, technical skills, and expert knowledge.

Other writers have looked more specifically at the role of healthcare professionals as public health advocates. The medical profession has a varied and at times contradictory history in terms of working for the public good (see Stevens 2001). At least in terms of the contributions of the health care community, McCally's (2002) examination of medical activism is more directly relevant to the anti-PVC movement. According to McCally, physicians, like other scientists engaged in environmental health debates, use their expertise to respond to scientific uncertainty surrounding policy questions. For example, in recent years, physician activists have participated in debates regarding precautionary principle development. The precautionary principle "requires that when potential of harm is present, but the evidence is incomplete, public policy ought to err on the side of caution—do no harm" (p. 152).⁵ However, such activism is limited, often viewed with suspicion by the professional mainstream, and not encouraged within the institution. Undergraduate and graduate level medical students are exposed to very few examples of medical activism. Student chapters of national medical organizations are a rare exception, but social responsibility, environmental health, and medical activism are generally neglected from the medical school literature, curriculum, and priorities of medical associations (McCally 2002). Further, much of physician activism is motivated by self-interest and consequently fails to produce solidarity with other social movements or other groups on larger social, human rights, or environment issues (p. 153).

Despite these barriers, activist physicians do regularly engage in environment, peace, health care reform, and human rights movements (p. 149). Physicians have been involved directly in the anti-PVC campaign, most notably as members of Physicians for Social Responsibility (PSR) and Health Care Without Harm (HCWH). For example, McCally is the current Executive Director for PSR, having served as President in 2004, and on the Board of Directors for many years. He is also active in the American Public Health Association, one of the first medical societies to take a position on PVC in

⁵ Widespread adoption of the precautionary principle by U.S. environmentalists, academics, and some policymakers followed from a small conference in 1998 at Wingspread, the Johnson Foundation's conference center in Racine, Wisconsin (Myers 2006).

medicine. In the mid-1990s, as an activist with PSR, McCally worked with public health advocate and physician of occupational medicine Peter Orris, and Greenpeace activists Joe Thornton and Jack Weinberg to write the first *Public Health Reports* article about PVC's role in medical waste incinerators, the effect on human health, and the call for the public health community to reduce the use of vinyl (interview, Thornton).

Not all the activists in the anti-PVC movement are professionals, but with few, albeit important exceptions, the individuals who work for core organizations in the movement are. Many of the movement protagonists who are not distinguished by their professional status, per se, nonetheless work with professionals. There are also participants in the movement such as Bill Walsh, the founder and national coordinator for the Healthy Building Network, who have atypical professional backgrounds for their current occupation. Despite the focus of his work, Walsh's background is not in building or architecture, but rather as a licensed attorney. The Center for Health, Environment, and Justice (CHEJ) represents the most important exception to this categorization. CHEJ exhibits membership traits common to traditional social movement organizations, whereby members are recruited (in this case, outside of the healthcare or green building industries).

Finally, the actors in the anti-PVC movement are a coalition of professionals, labor unions, and environmental health activists. Instead of a contentious relationship among these groups, they have come together, largely under the leadership of Health Care Without Harm (HCWH), to address the PVC issue in the health care industry. In turn, HCWH interacts with other core organizations, including those representing green building interests. A cooperative arrangement allows different stakeholders to stay informed of each other's concerns and activities and to coordinate efforts when necessary or desired. As Orbach (1999) has noted, a coalition between organized labor and the environmental movement, two of the most powerful social movement sectors in the United States, has the potential to "present a strong force in favor of a just and ecologically sustainable economy" (p. 46).

As an example, in California, an alliance of unions, environmental organizations, and public interests groups joined together to form the Coalition for Safe Building Materials to fight changes in the California Plumbing Code allowing the widespread use of CPVC (chlorinated PVC) pipes in housing.⁶ While the coalition was ultimately unsuccessful, the labor/environmental alliance illustrates that commonalities do exist and can be addressed by the groups collaboratively. I argue however that at present, labor's involvement within the movement is growing, but it is still fairly limited. By and large, within labor/environmental/professional coalitions, labor is not doing a great deal of problem framing and strategizing. The movement could be strengthened if efforts to involve labor were increased and if labor were to take on a more involved role in the movement.⁷

Advocacy Organizations

There is a wide and diverse range of stakeholders involved in the politicization of PVC that prevents easy categorization of the different organizations. Represented just within the healthcare and green building branches of the anti-PVC movement are conventional social movement organizations (SMOs), interest groups, business interests, and nonprofit organizations. However, the line between these categories is not easily demarcated. It is not the purpose of this research to compare the varying tactics, strategies, or objectives by organizational type, but to understand how these various groups have come together to politicize PVC. Having said this, it is still useful to describe the different types of advocacy organizations in order to better understand the distinctions among stakeholders.

Andrews and Edwards (2004) seek to clarify the differences among advocacy organizations such as interest groups, public interest groups, social movement organizations, and nonprofit organizations involved in the political process. They employ 'advocacy organizations' as a broad umbrella term to describe organizations that "make public interest claims either promoting or resisting social change that, if

⁶ CPVC is controversial in part because of the extra chlorine required for manufacture.

⁷ Any interactions between labor and managerial representatives are issue and situation specific and are not meant to comment on greater worker/employer relations.

implemented, would conflict with the social, cultural, political, or economic interests or values of other constituencies or groups” (p. 481). Interest groups are defined broadly as “voluntary associations independent of the political system that attempt to influence the government,” whereas public interest groups seek “a collective good, the achievement of which will not selectively and materially benefit the membership or activists of the organization” (p. 481). Businesses and associations can be characterized as interest groups, although Andrews and Edwards’ definition should be expanded to include action that attempts to influence important non-governmental entities as well. SMOs are a bit trickier to define as evidenced in numerous debates among social movement scholars regarding participation, membership, level of institutionalization, tactics, identity, moral and ideological claims, organization form, and goals (p. 482-483).

Della Porta and Diani (1999) define social movements as “informal networks based on shared beliefs and solidarity which mobilize around conflictual issues and deploy frequent and varying forms of protest” (p.16). And finally, the anti-PVC movement is also comprised of nonprofit organizations. Referring specifically to advocacy nonprofit organizations, O’Neill (1989) defines these groups as “primarily involved with lobbying or disseminating information directed toward broad societal objectives or collective goods rather than outcomes of benefit to their own members” (p. 10 cited in Andrews and Edwards 2004:484). The broadness of this definition indicates overlap between nonprofits and SMOs; however, nonprofit organizations can further be differentiated by their 501(c)(3) tax status, which prevents them from participating in political campaigns and restricts their lobbying activities.

The various stakeholders involved in the PVC debates are representative of a range of advocacy organizations. However, in the sense that all of these are ‘organizations,’ this term is used throughout this dissertation to refer to the collective of groups involved in the anti-PVC movement. When referring to activists and participants on all sides of the debates, including vinyl industry interests, the term ‘stakeholders’ is used instead. My point is not to dismiss the importance of understanding the different characteristics of these organizations; thus, where necessary, these groups are further

differentiated by their status as businesses, interest groups, public interest groups, SMOs, and nonprofits.⁸ A further distinction lies in the movements 'participants' and 'activists.' All individuals and organizations involved in the anti-PVC movement are participants, but not all are activists. For example, Keith Callahan, Catholic Healthcare West's vice president for supply chain management is a participant, whereas Mike Schade, Coordinator of CHEJ's PVC Campaign is an activist.

Health Social Movements

The anti-PVC movement has branches within both green building and the healthcare industry. This section explores the anti-PVC movement within the healthcare industry. Over the last several decades health social movements have been primarily concerned with problems of patient care including: access to and quality of healthcare, health inequalities based on race, ethnicity, gender, class and/or sexuality, disability, research funding concerns, disease or illness experience, and contested illnesses (Brown et al. 2004; Kolker 2004). Important research has documented citizens taking "their health care into their own hands" (Morgen 2002, see also Bullard 1994, Epstein 1996). Public interest and concern with healthcare access in particular has been fairly well reported in the media, but few scholars have devoted much attention to health social movements (HSMs) (Keefe et al. 2006). Moreover, according to Brown et al. (2004), "researchers studying HSMs typically have not adopted social movement perspectives; in fact, much of the research on HSMs has not been conducted by sociologists" (p. 52).

As health social movement scholars, Phil Brown and colleagues' (2004) work on HSMs is applicable here. Brown et al. (2004) build on Della Porta and Diani's (1999) definition of social movements to define HSMs as "collective challenges to medical policy, public health policy and politics, belief systems, research and practice that include an array of formal and informal organizations, supporters, networks of cooperation, and media" (p. 679). They hold that HSMs challenge political power, professional authority, and personal collective identity (Brown et al. 2004). Keefe, Lane, and Swarts (2006) add that HSMs are comprised of those affected by the issue and whose actions challenge the

⁸ Please see Appendix A: Methods for a listing of where core organizations fall categorically.

scientific and medical establishments. By emphasizing ‘personal collective identity’ and ‘those affected,’ both of these definitions suggest that what medical sociologists refer to as the ‘illness experience’ is central for the key actors involved in HSMs. However, as I discuss in the previous section, my intent is to expand that conception of HSM stakeholders to include those participants who are not necessarily directly impacted by the issue they are contesting, but who have elected to mobilize around a certain issue, in this case, contesting the use of PVC.

Brown et al. (2004) divide HSMs into three categories: health access movements, constituency-based movements, and embodied health movements. Health access movements are self-explanatory; these are movements seeking equitable access to healthcare and improved healthcare services. Constituency-based health movements seek to redress the inequalities within the healthcare system based on race, ethnicity, disability, gender, class and/or sexuality. Embodied health movements “address disease, disability, or illness experience by challenging science on etiology, diagnosis, treatment, and prevention” (p. 52).

As ideal types, some movements may share characteristics of more than one category within Brown et al.’s typology. As an example, the environmental justice movement overlaps between the constituency and embodied health movements with its focus on the disproportionate burden of polluting facilities in communities of color and the illnesses that may arise from exposure (p. 53). By framing their organizing efforts and critique of the system through their personal awareness and illness experience, environmental justice (EJ) activists exhibit what Brown et al. consider key about the embodied nature of this movement. Additionally, EJ activists seek to address “disproportionate outcomes and oversight by the scientific community and/or weak science” (p. 53). Thus the EJ movement also has similarities with constituency-based health movements.

The Public Interest Health Movement

Lacking from Brown et al.’s (2004) typology is a fourth ideal type that would include the characteristics of the anti-PVC movement, particularly as it manifests within

the healthcare community. Like the EJ movement, the anti-PVC movement shares some characteristics of more than one HSM ideal type; however, it does not sufficiently resemble any of the three categories within the typology to be regarded as a good fit. While Brown et al.'s definition of HSMs is inclusive enough to encompass the anti-PVC movement, their typology presumes social movement action is taken on behalf of or by a specific constituency, such as a particular demographic group, or a group characterized by their relationship to or with a particular illness, disability, or disease. In large part, Brown et al.'s categories can be regarded as primarily addressing the concerns of patients or potential patient populations by organizations and activists outside of the healthcare industry. While this is not always the case, particularly in embodied health movements (e.g., scientists working with breast cancer activists), the objectives of these movements tend not to either originate or be promoted (or both) within and by the healthcare community. Such an interpretation does not adequately encompass activism or mobilization among healthcare workers and organizations nor does it accommodate those movements that combine labor and/or union interests with public health and patient concerns. There is no clear category for activists within the healthcare industry and their allies seeking to green the profession and medical facilities.

A fourth ideal type, Public Interest Health Movement (PIHM) would recognize the intersection between labor, public health, and the environment. Like HSMs, scholars have largely neglected those medical social movements comprised solely of physicians and their organizations and associations as well (McCally 2002). Creation of a fourth category establishes a way to differentiate those movements comprised of both health and medical organizations. This is not a new movement; but it is one that is absent from Brown et al.'s typology. McCally (2002) and others have commented that today's environmental health movement "draws on older public health concepts of sanitation and population health and newer notions of ecosystem health" (p. 146). As indicated in chapter two, the history of public health has long, if inconsistently, attended to the link between the environment and public health concerns. As progressive healthcare organizations and facilities move towards what they regard as environmental

sustainability, this may be a return to addressing some of these earlier concerns while at the same time broadening the scope. PVC can be regarded as just one aspect of this trend within healthcare, which also includes efforts towards improving food health, greening facilities, mercury elimination, environmentally-preferred purchasing, and green chemical policies. A public interest health movement thus emerges in response to the pressing issues of the day and as a result, there is no constant designated constituency. Unlike other HSMs, PIHMs are not trying to redefine a personal trouble into a public issue. Members of the movement and their allies are predominately within the industry and not directly affected.

If we compare this ideal type with Brown et al.'s (2004) typology, it becomes evident that a fourth category is warranted. There are four characteristics that distinguish PIHMs from other HSM's; 1) their relation to the problem, 2) their power to address the problem, 3), they work within the system; and 4) they address type three (see chapter one) contested illnesses that have diffuse or hard to establish causes. Individually, not all SMOs, interest groups, or nonprofits involved in the PVC debates meet these criteria; however, collectively they form the basis of what a PIHM would look like. Examining the characteristics of PIHMs furthers our understanding of how these characteristics come together to shape PVC framing concerns and the politicization of PVC. Below I discuss each of the four characteristics of PIHMs in detail, using PVC to illustrate. However, as an ideal type, these traits can apply to other politicized environmental health or healthcare related concerns as well.

Relation to the Problem

By relation to the problem, I mean the movement participant's position in the class structure and their relationship to the means of production. Unlike many activists represented in Brown et al's (2004) typology, those in the anti-PVC movement in healthcare are professionals within the industry rather than private citizens. This also includes businesses in the anti-PVC movement (i.e. Kaiser Permanente and Catholic Healthcare West) that have been highly effective in their efforts to deselect PVC. The organizations involved in the movement do not represent workers employed in the

manufacturing or production aspects of vinyl chloride and PVC products. This ‘separation’ from the means of production introduces an element of detachment and alienation for the majority of the movement’s participants. While the anti-PVC movement is occupationally driven, concerns about PVC are predominately directed at the use stage. Problems are framed in terms of consumption, rather than in terms of occupational health and safety. In PIHMs, since the movement participants are not materially dependent upon the particular forms of production practices for these items of consumption—whether they are intravenous bags made of PVC or mercury thermometers—they are uninhibited from challenging the continued use of these products. In this sense, there are no real economic risks for PIHM participants. No evidence indicates that attempts by nurses or other health care professionals to influence purchasing decisions has led to any form of disciplinary action. Similarly, those involved do not directly represent those affected or perceive themselves at risk. Thus, PIHMs do not necessarily share the same sense of urgency as EHM activists who may be ill or have limited access to health services (Brown et al. 2004).

Just as the movement is influenced by PIHM participants’ relation to the means of production, their class position as professionals and white collar workers is reflected in organizational values, decision-making, tactics, and goals. For example, the decision making of the Oregon Center for Environmental Health, a Portland-based nonprofit organization “dedicated to reducing and eliminating toxic chemicals,” is influenced by a Board of Directors comprised of all professionals—ranging from a chemical engineer, to a marketer, to lawyers, and professors specializing in public health and air toxics. Large health care systems are able to pressure medical supply companies to provide PVC alternatives under the rubric of environmental health and patient safety, but production concerns are not emphasized in their framing of the problems. In my interview with a representative with B. Braun, a major producer of PVC/DEHP free IV bags, I asked if the company had a problem with how PVC was manufactured. The interviewee responded, “It wasn’t manufacturing, it was more of the clinical issues with patients and a secondary to that, the environment.” Concerns for PVC production workers are largely off the radar

of many in the current movement and are thus not reflected in their decision-making, framing of the problems, or goals.

Much of the research on medical professionals focuses on physicians and the American Medical Association or other specialists and their societies, rather than nurses or professional nursing associations (Stevens 2001; Light 2000). While the PIHM accommodates activism among physicians, it explicitly incorporates space for activism among non-physicians and activists in non-authority positions. While health professionals are the core of the PIHM, a PIHM includes coalitions with unions, public interest groups, and health-based occupational groups. Coalition formation with organizations with non-professionals and organizations with different relation to the means of production may occur. PIHMs benefit from the involvement of allies, who at times may even serve as leaders in the movement, as is the case with the anti-PVC movement and HCWH. However, PIHM allies work with those receptive members of the healthcare industry rather than directing their efforts to challenging those resistant to change.⁹ Medical and healthcare professionals may network with other organizations outside of the industry, but generally, those other organizations are not integral to the movement within the healthcare industry.

Power to Address the Problem

The occupational status of those involved in the movement lends credibility, legitimacy, and a 'professional voice' to PIHMs. Doctors and nurses consistently rank among the top most prestigious occupations in public opinion polls (Harris Interactive 2006). Professional organizations' fundraising and mobilization of resources falls along different patterns than may be experienced by other SMOs. In part, because many of the stakeholders are healthcare facilities or businesses, financial constraints are less of an issue. However, while this is an asset to PIHMs, it may also impede movement growth. Individuals who are not part of the established movement may have trouble accessing some of the information whether due to high conference costs or due to limited access to information, as in the case of member-only websites. Also, because these groups tend to

⁹ This is not to imply that there are no challenges for activists with these relationships.

work within the system, they may be able to secure funding from sources that more confrontational or controversial groups would not be able to access.¹⁰ As an example, the Oregon Center for Environmental Health (OCEH), receives U.S. Environmental Protection Agency support and funding for select OCEH programs.

Social movement theorist Diani (2000) states, “Collective action requires long term commitments and the willingness to engage in projects which rely upon the contribution of all the parties involved for their success” (p. 391). In other words, social movements succeed in part because of the ‘staying power’ of their participants. Thus, because those organizations most involved are institutionalized within the political and economic system, they are unlikely to dissolve when goals are reached. Earl and Schussman (2003) point to two advantages of organizational longevity for social movement organizations (SMOs): “the ability of SMOs to employ activists, thus ensuring the livelihood of professional activists, and the ability of SMOs to retain organizational experience and learning” (p. 179). The core anti-PVC organizations are firmly established with a range of founding dates from 1945 (Kaiser Permanente) to 2000 (the Healthy Building Network).¹¹ The power to address the problem is also evinced by the fact that PVC concerns have largely become institutionalized values, adopted by major health care systems. While there are challenges within the health care system to phasing out PVC, much of the resistance to doing so does not come from health care providers, but from interests outside the industry.

The early leaders in the anti-PVC movement established a framework for addressing health and environmental concerns, thus positioning the movement to progress as well as broaden to include associated or similar concerns. Coalition formation and networking has helped root the movement within the health care community. For example, Hospitals for a Healthy Environment (H2E), a not-for-profit

¹⁰ In the anti-PVC movement, CHEJ is an exception, seeking membership dues from both individuals and organizations. However, while CHEJ is allied with the healthcare branch of the anti-PVC movement, it is not part of it.

¹¹ Founding dates for the rest: Center for Health, Environment, and Justice: 1981 (then called Citizens Clearinghouse for Hazardous Waste), Vinyl Institute: 1982, Catholic Healthcare West: 1986, Health Care Without Harm: 1996, and the U.S. Green Building Council: 1993.

organization “creating a national movement for environmental sustainability in health care” was jointly founded by the American Nurses Association, the American Hospital Association, the Environmental Protection Agency, and Health Care Without Harm. H2e now has almost 1,400 partners representing over 7,50 health care facilities (www.h2e-online.org). While H2E’s objectives are far-reaching, because of the high percentage of PVC used in health care the organization specifically targets dioxin elimination. Given the size and composition of the organization, H2E illustrates how efforts at phasing out PVC in the health care industry have become embedded and institutionalized within the industry.

Working Within the System

PIHMs seek to change the system from within rather than trying to challenge and push for change from outside the system. Participants in the anti-PVC movement are healthcare professionals and businesses within the industry pursuing a market driven movement rather than a policy change movement, although such an objective remains a possibility. A range of participants have coalesced around an expressed concern related to health care and environmental stewardship. In this regard, PIHMs are quite different from Brown et al’s (2004) HSM categories. As noted in the H2E example, the organization perceives itself explicitly as contributing to a national social movement. The types of organizations that H2E partner with are extensive and include: health care facilities, health systems, group purchasing organizations (GPOs), health care professional or trade associations, vendors, manufacturers, consultants, and other service providers, local, state or regional environmental agencies, and member or community-based organizations working with health care facilities. By targeting professionals and working within the health care system, H2E typifies the PIHM ideal type.

Reform movements that work within the system may seem contrary to the notion of more radical social movements which are limited in their institutional access. The professional legitimacy and authority of those involved and even their size, as in the case of organizations such as Kaiser Permanente or Catholic Healthcare West, potentially translates into significant power to regulate PVC and/or the power to influence the

market. There may be little direct action, but direct action is often unnecessary.

PIHMs adopt less traditional but more reformist approaches to action. Monopsonistic, or more accurately oligopsonistic, purchasing power enabled Kaiser Permanente to pressure Collins and Aikman (C&A) one of the nation's largest manufacturers of PVC-backed carpet to develop an entirely new line of PVC-free carpet. As one activist in the industry described Kaiser's market power:

...they've done a ton of work just trying to figure out what's in the product that they buy. They'll send very extensive questionnaires to vendors asking them 'what's in the products they are buying, how are they manufactured, how are they disposed of?' a whole series of questions that many of these vendors have never even thought about before. 'What do you mean you want to know all this stuff? We don't know.' Kaiser will write them back and say well, you have to find out if you want to do business with us.

In 2005, Catholic Healthcare West (CHW) awarded a \$70 million contract to B. Braun Medical Inc. for supplying its hospitals with PVC-free and DEHP-free intravenous (IV) bags, solutions, and tubing. CHW's previous contract had been with Baxter, a global medical supply company and the largest manufacturer of IV lines in the United States. CHW and HCWH had approached Baxter in 1998 or 1999 requesting development of a PVC-free IV bag; however Baxter failed to follow through. According to Sister Mary Ellen Leciejewski, CHW's Ecology Program Coordinator, "things kept getting pushed back and pushed back and things weren't happening." As CHW's Kathy Kudzia, Director of Supply Chain Management, explains, "I think that was the message we sent to Baxter. We had gone out there, Sister Mary Ellen, myself and really kind of laid it on the line for them that as an organization if they didn't have products available on the market ready to go by February of 2006 then we would make the change."

Baxter ultimately addressed CHW's demands in April 2006, when the company introduced AVIVA, a non-PVC and non-DEHP IV solutions line available on a limited basis to pilot center sites. In a churlish telephone conversation with a Baxter representative, I stated I was researching trends in medicine and asked if the product line was developed to meet market demand for non-DEHP IV bags. In contrast to a B. Braun representative, the Baxter representative did not agree that the move towards a PVC-free and DEHP-free IV line was a trend and was quite resistant to acknowledging health

concerns associated with DEHP. Clearly, there remains disagreement within the industry regarding the health risks associated with PVC and DEHP. However, should the majority of hospitals and healthcare facilities move away from PVC devices, manufacturers that do not respond to market demands may suffer economically. Additionally, these companies jeopardize their reputations if they concede DEHP leakage occurs and is harmful, yet they continue to produce and sell a PVC IV line plasticized with DEHP. Thus, when professionals and healthcare organizations ‘work within the system,’ the relation to production must be considered. However, as in the case with Baxter, while not all in the health care industry are part of the anti-PVC movement, they still must compete economically. Even if these companies do not accept that there are problems with PVC, if they wish to remain viable, they still eventually respond, as Baxter did with AVIVA.

PIHMs also work within the system because they accept the legitimacy of the state and do not overtly challenge state authority. As professionals, many of them are likely to see government officials and bureaucrats as their colleagues. They do not take issue with the state’s role as a protector of economic interests. As expressed by many interviewees and advocated throughout healthcare literature and promotional material, the development and use of alternatives to PVC are regarded as the primary solution to the problems associated with PVC. The anti-PVC movement focuses largely on the use stage of the PVC lifecycle, particularly in health care where the primary concern is DEHP leakage. There is nothing inherent in the movement’s framing that proposes major political modification, such as greater regulation of chemicals, or challenges to economic growth. As a movement that relies on the market for social change, challenges to the economic system are not expected.¹² While representatives of some organizations I interviewed expressed disappointment with different government actions (and inaction) in protecting public health on this issue, they did not respond with any significant challenges to governmental authority.

¹² In chapter 7, I discuss this “treadmill of production” in greater detail.

In particular, the Food and Drug Administration and the Consumer Product Safety Commission were cited as government agencies that should be more proactive in monitoring and regulation consumer products. Anti-PVC protagonists—particularly unions such as the American Nurses Association (ANA) and the International Fire Fighters Association (IAFF)—do use lobbyists to advocate on behalf of their interests, but this political activity is not likely to include significant attention to PVC concerns. The IAFF also partners with a number of government agencies, including the National Institute of Occupational Safety and Health’s National Personal and Protective Technologies Laboratory (NPPTL), the National Aeronautics and Space Administration (NASA), the National Institution of Science and Technology (NIST), as well as the military to investigate fatalities, research fire fighter exposures, test personal protective gear, and transfer military technology to civilian uses.

Brown et al. (2004) present HSMs as along a continuum of strategies and agendas. At one end, are direct-action organizations that challenge current scientific and medical paradigms largely from outside the system. At the other end of the continuum are advocacy organizations, such as those predominately found within the anti-PVC movement. These groups are described as “work[ing] within the existing system and biomedical model, us[ing] tactics other than direct, disruptive action (e.g., education), and tend[ing] not to push for lay knowledge to be inserted into expert knowledge systems” (p. 53). This approach is representative of PIHMs more generally. While their professional positions within the system affects their strategies, as Brown et al. (2004) point out, it also influences the lens through which they approach medical problems.

Contested Illness

The final PIHM characteristic concerns the contested nature of PIHM health concerns. By this I mean that those issues PIHMs address are environmentally or occupationally-induced and are the subject of scientific, political, or public debate over the cause of the health problem. As described in chapter one, in the third type of contested illness, a link may be recognized between environmental or occupational exposure and a health risk, but the degree (or even *if*) that exposure leads to harm is

greatly contested. The environmental source of the health problem is a known toxic, as in the case of vinyl chloride, dioxin, or DEHP, but disputes arise because a scientific link has not been definitively established (or if so, the degree that it is harmful remains contested), and/or because of the difficulty in attributing the health problem or illness to a specific toxic source. PVC is particularly open to politicization because health problems are associated with all stages of its lifecycle. Activists and participants involved in PIHMs must decide what solutions they believe are acceptable among interest groups and are achievable. On the other hand, vinyl supporters work to minimize or altogether dismiss the risks associated with PVC.

In the case of DEHP, there *is* definitive evidence that the phthalate leaches from PVC IV bags (U.S. Food and Drug Administration 2002). However, the controversy centers on what level of DEHP exposure is harmful for humans and in particular, which patient populations? Dr. Ted Schettler (2006), Science Director of the Science and Environmental Health Network and science advisor for HCWH, asks, “When do we know enough to act to protect people from unnecessary and potentially harmful exposures?” (p. 9). With contested illnesses and health problems, different sides of the debates often employ the same research or government reports to bolster their own position. For example, while PVC opponents point to what they consider an overwhelming amount of evidence of DEHP’s toxicity and associated harm, PVC supporters argue that evidence on the deleterious effects of DEHP is inconclusive in humans. Further, in a case of backward logic, PVC supporters point to the lack of governmental regulation on PVC products as an obvious confirmation of the safety of the material. A *Plastics News* (2002) editorial, “Politics Shouldn’t Determine PVC’s Fate,” argued that even though some government studies have found problems with phthalate exposure, “numerous scientific studies and government agencies do not see merit in widespread phasing out of PVC, either to cut down on dioxin emissions or to reduce phthalate exposure” (p. 6).

In part, type three contested illnesses remain contested as an outcome of the fragmented approach of the biomedical model and the compartmentalization of

government regulation due to a multitude of government agencies. For example, phthalates are widely used in consumer products and phthalate exposure is not limited to IV bag leakage. As Schettler (2006) points out, “there is virtually no attempt to look at the bigger picture. The focus is generally on one source or one product at a time” (p. 3). With DEHP, much of the activism in health care is aimed specifically at discontinuing use of PVC/DEHP IV bags in the NICU, given the known vulnerability of male neonates. Thus, even some movement participants fail to take a holistic or integrated approach to environmental and human health problems associated with PVC use at large.

Health care professionals may be motivated to respond to contested health problems as an outcome of training that emphasizes prevention, as is the case for many health care professionals in the anti-PVC movement. However, training may also be an impediment if potential activists are committed to the idea that the authority of science is incontrovertible, where uncertainty then leads to inaction, rather than action. Health care and medical professionals receive little training in environmental and occupational exposure and health. Because all three factors may influence PIHM participants, the tendency may be for these social movements to take a more conservative approach to contested or environmentally-induced illnesses and health problems. In these situations, PIHMs may differ from other HSMs as described by Brown and colleagues (2004) in that they not only address contested illnesses, but *how* they remain contested.

In their approach to contested health problems, many participants in PIHMs are part of what Brown et al. (2004) term the *dominant epidemiological paradigm* (DEP). The DEP is “the codification of belief about disease and its causation by science, government, and the private sector. It includes established institutions entrusted with the diagnosis, treatment and care of disease sufferers, as well as journals, media, universities, medical philanthropies, and government officials” (Brown et al. 2004:61). As members of the DEP, many health care professionals are unwilling, or even unable, to challenge the conventional approach to medicine or the basic assumptions of modern science. In this sense, PIHMs are unlikely to take on the most controversial and politicized

environmentally-induced illnesses. Or, at the very least, they will not do so until enough research has been generated within the DEP for their comfort level.

Summary

The interrelation of these four characteristics—relation to problem, power to address the problem, working within system, and contested illness—serves to engender a particular type of HSM that has not previously been identified in the literature. Emerging public health movements may be a return to historical roots of medicine where occupational and public health concerns played a larger role in medicine's approach to prevention and healing. As a PIHM, the anti-PVC movement goes beyond traditional notions of public health, with work taken on by individual 'champions' in hospitals and health care facilities and by industry leaders. PIHMs' emphasis on social change recognizes the intersections among health, occupation, and the environment. However, their approach is largely determined by their class status as professionals and far distanced from PVC production.

Approaching health and environmental concerns from within the system may introduce a particular set of challenges or barriers. As possible with all social movements, some within the social movement may hide their self-serving objectives under an umbrella of claims for improving public welfare. Professionals may be reluctant to expand the scope of their involvement either beyond their paid positions or beyond their own profession. Professionals may be unwilling to engage in what McCormick, Brown, and Zavestoski (2003) term 'boundary movements' where the line between experts and laypeople is blurred and one movement crosses into other social movements. Those within the system may have a hard time working with those working outside the system.

As an example, Rebecca Berg (2005), editor of the National Environmental Health Association's (NEHA) *Journal of Environmental Health*, examined some of the tensions between the environmental movement and the environmental health profession. She found that environmentalists tend to perceive, "that environmental health as a profession is neither able nor willing to address controversial manmade threats to human

health, particularly those associated with industry activity” (p. 41). Environmental health practitioners disagreed, although one acknowledged that, “government is slow and clumsy and it takes us 15 or 20 years to change our mind on anything” (p. 42).

Participants within movements do not necessarily share the same concerns or tactical approaches for achieving their objectives. In this chapter I argued that within the anti-PVC movement is largely an occupationally-driven movement within the health care and green building industries of the economy. I noted the important exception of two activist organizations in particular, Greenpeace and the Center for Environment and Health. The anti-PVC movement’s primary targets are market change and education within both health care and green building. Actions are not generally directed at state authority, although some actions are designed to change specific government agency policies. In the next chapter I examine the formation of the anti-PVC movement, exploring the debates and points of contention that have contributed to the current course of the anti-PVC movement.

CHAPTER IV

FRAMES, COUNTERFRAMES, AND MOVEMENT FORMATION

“Doubt Grows with Knowledge” Goethe.

Chapter three, *Pushing the Boundaries of Health and Social Movement Theory: The Anti-PVC Movement*, theoretically examines the anti-PVC movement and introduces a fourth ideal type of HSM, the Public Interest Health Movement, to build on Brown and colleagues (2004) typology of HSMs. I argued that the anti-PVC movement is largely an occupationally-driven movement within the health care and green building industries of the economy. I noted the important exception of two activist organizations in particular, Greenpeace and the Center for Health, Environment, and Justice. The anti-PVC movement's primary strategies are promoting both market change and education within the health care and green building industries. I emphasized the role professional advocates play in PIHMs and how their position within the class system influences strategies, tactics, and goals for the movement. Coalitions and collaboration between interest groups, social movement organizations, and other advocacy organizations serve as a strength of the movement, although I argued the movement would benefit from more extensive involvement by labor unions.

In this chapter I provide a brief historical overview of the development of the anti-PVC movement since the early 1970s, including primary debates and issues of contention and conflict to better understand the current movement. I use collective action frames and framing processes to understand the dynamics of the anti-PVC movement. The current framing of concerns, strategies of movement members, and counterstrategies of the plastics and chemical industries have been markedly influenced by past controversies and conflicts. Some of the framing strategies employed by various stakeholders in the current movement are the same or similar to those used by organizations earlier in the movement, but even those strategies that are different should be recognized and examined for their influence in shaping the movement.

My initial objective for this project was an investigation and analysis of current PVC politicization and the debates surrounding its use. However, as I learned more about why and how different stakeholders in health care and green building challenge PVC's use, I realized that full understanding of the politicization of PVC required a more in-depth historical examination of how PVC first became problematized and contested. In comparison with the early anti-PVC movement, today's movement is most prevalent in the health care and green building industries; however, the actions and responses of various stakeholders have significantly been shaped by social, political, economic, scientific, and health debates that have both preceded and occurred outside of these two industries.

The context and foundation of today's anti-PVC movement can be understood by examining three different factors for their influence on the current anti-PVC movement in health care and green building: 1) earlier challenges and mobilization around PVC, 2) politicization that has occurred outside of health care and green building which has been influential on the movement, and 3) countermobilization tactics employed by the chemical and plastics industry. These countermobilization tactics are designed to refute the challenges of movement protagonists or otherwise aim to delegitimize activists and their work. These tactics include, use of counterrhetorics, non-problematizing, use of scientific arguments, credibility arguments, and direct action. In particular, the use of scientific arguments and appealing to experts is consistently used by a number of stakeholders in PVC debates. However, there are significant differences in the political and economic power of organizations such as the Vinyl Institute, the PVC trade association representing over twenty multinational corporations, compared with anti-PVC organizations like the Oregon Toxics Alliance, a nonprofit environmental health organization with one paid staff member.

I determined that prior to the involvement of the health care and green building industries there were at least three major issues of contention surrounding PVC use and two major waves of the movement. Two of these issues of contention concern worker health and are very much interconnected. As addressed in chapter one, the history of PVC production is laden with controversies and accusations of industry deceitfulness in

its failure to protect the occupational health of workers. The occupational health of production workers emerged as the first source of conflict in the 1970's. The second major concern also emerged in the 1970's and centered on the risks of burning PVC. At this time, although the Manufacturing Chemists' Association was doing its best to project a positive public image in the face of emerging cases of angiosarcoma and acroosteolysis, the industry was also being criticized and challenged for PVC's culpability in fire related fatalities and injuries. Together, mobilization around occupational and fire fighter health concerns represent the first wave. The second, and more recent point of contention prior to today's movement began with Greenpeace's chlorine chemistry campaign of the early 1990's. This campaign was instrumental in bringing PVC to the forefront as an issue of contention. All three of these issues fall under the rubric of PVC environmental and health safety concerns.

This chapter is divided into three sections. I begin the chapter with an introduction to and discussion of the concept of framing as it relates to the anti-PVC movement. In the following section, I provide an historical overview of the anti-PVC movement, highlighting some of the major points of contention, while interweaving an analysis of the movement's use of framing. I focus largely on the debates and issues of contention that have emerged after the commencement of Greenpeace's seminal anti-PVC campaign. While the characteristics of an anti-PVC public interest health movement, as discussed in the previous chapter, begin to emerge, health care organizations and activists are not as deeply involved in these early stages. In the final section I examine the counterframing and counter strategies of the plastics and chemical industries as they respond to the politicization of PVC.

Framing

In the process of politicizing PVC, actors in the movement or in various organizations, must reach some sort of consensus about what aspect(s) of PVC are of most concern. In other words, before collective action is taken, movement members must determine and agree upon the problem. As I discuss below, for the first wave of the movement, concern was expressed largely with regard to occupational health for production workers and fire fighters as well as fire safety. As a response, vinyl chloride

exposure levels were lowered and more stringent fire safety protections were implemented. The second wave of the movement began with Greenpeace's chlorine chemistry campaign, a campaign that ultimately shifted and more specifically targeted PVC. In the third wave, or current anti-PVC movement, many organizations and activists express serious concern with the health and environmental problems associated with the entire PVC lifecycle. However, this is not necessarily true for all members of the movement. Those that are more likely to be participants rather than activists are often concerned with only one or several specific PVC related risks. As an example, and I discuss in the following chapter, for some health care movement participants concern about PVC lies primarily with DEHP exposure. In any movement, once the primary concerns are identified, movement participants must determine solutions and persuade others their concern is worthy of action. Through this process of collective action framing, "activists identify problems, diagnose their causes, propose solutions, and give reasons for collective action" (Reese and Newcombe 2003:294).

Framing is an active process whereby those involved possess agency to shape the movement (Benford and Snow 2000). The concept of 'frames' stems from the work of Goffman (1974) "to denote 'schemata of interpretation' that enable individuals to 'locate, perceive, identify, and label' occurrences within their life space and the world at large" (Goffman, p. 21 cited in Benford and Snow 2000:614). In other words, frames represent different versions of reality and are used to espouse or defend a person's, an organization's, or a social movement's definition of the situation (Shriver, White, and Kebede 1998). In this sense, "Frames organize experiences and guide the actions of the individual or the group" (Taylor 2000a:511). During the course of the anti-PVC movement, the concerns of movement participants have been formulated or framed, reevaluated, and reframed. Thus they change and shift the focus of action and the accompanying debates based on new evidence, the vinyl industry's counterframes, or in response to a new opportunity for mobilization.

Framing analysis generally tends to assume that movements engage in oppositional framing or activities designed to 'demobilize antagonists' (Pellow 1999). In these situations, opponents respond to each other's frames through reframing their initial

frame and then by counterframing. While framing emphasizes shared understanding of ideas and meanings, framing processes occur within a specific political, social, and economic context. Frames represent more than just a different understanding and construction of a problem; they are reflective of the political and economic power of different stakeholders who draw not only on 'cultural stock' (Zald 1996) for frame construction or organizational tactics, but also their structural power. Opponents of the anti-PVC movement often organize and respond through trade associations. Jasper and Poulson (1996) observe that the use of professional or trade associations as countermovement organizations serve to aid targeted individuals and institutions, coordinate their responses, and share information about effective strategies. Domhoff (1998:33) has further noted the role of trade associations in advancing the goals and values, "especially the profit motive" of the corporate community. Representing all the major businesses in a specific industry or economic industry, trade associations are part of a corporate network joined for the purposes of relating to one another and the government.

Understanding the frames used in the anti-PVC movement is important for four reasons. First, over the course of the movement, different environmental or health problems associated with PVC have been identified and emphasized. Second, the current anti-PVC movement spans two distinct economic sectors. There is substantial overlap between the health care and green building industries with respect to concerns over the broader PVC lifecycle. The industries also overlap with regards to some more specific concerns related to PVC, such as dioxin. However, different problems, such as the problem of DEHP and the problem of landfilling PVC, are more salient to the professionals within health care and green building respectively, and thus emphasized. In this way, frames function to enhance the resonance for a particular audience. Resonance reflects the effectiveness or mobilizing potency for potential movement adherents (Benford and Snow 2000). Knowing their intended targets, health care activists are more likely to frame their concerns around problems of use and consumption (i.e., health risks from DEHP), whereas green building activists are more likely to frame concerns around disposal or fire safety. Similarly, adherents recognize that the anti-PVC movement in

both industries is embedded within a larger movement to green health care and the green building movement as a whole. Third, understanding the frames used in the anti-PVC movement is important because there are some social movement organizations, such as Greenpeace and CHEJ, whose work interconnects and overlaps with the health care and green building industries, but nonetheless direct their efforts at different targets. Fourth, understanding the movement's framing is important for understanding the counterframing strategies of the plastics and chemical industries. In light of the political and economic strength of the plastics and chemical industries, this chapter focuses extensively on their counter strategies.

Snow and Benford (1988) note that the process of creating collective action frames involves three core framing tasks: diagnostic framing, prognostic framing, and motivational framing. Together, these three tasks enable social movement actors to identify the problem, attribute blame, and mobilize action (Benford and Snow 2000). The first task, diagnostic framing, involves locating the origin of the problem and attributing blame or responsibility to some source. Gamson (1992) refers to this as "injustice framing." In the early 1990s, when Greenpeace sought to address concerns regarding hazardous chemicals, they realized that the solutions lied in changing things at the input level, with the production technologies. According to an interview with Joe Thornton, a former Greenpeace activist, "there weren't many concrete issues at the time to focus on in terms of the front end, so the chlorine chemistry was really our effort to make concrete the campaign to change production processes." Thus, Greenpeace diagnosed the problem as 'chlorine chemistry.' Benford and Snow (2000) observe that the task of attributing blame may be complicated by disagreement among and within different social movement organizations. In this case, as the only SMO involved with this campaign, Greenpeace experienced no external competition in defining the situation. Next, having identified the problem, SMOs and activists must propose solutions and determine the tactics and strategies to be used to achieve those objectives.

This second task, prognostic framing, has been referred to as both "consensus mobilization" (Klandermans 1984) and the "agency component" of framing (Gamson 1992). Prognosis framing entails deciding what to do about the problem. The clear

prognosis demanded by Greenpeace was a chlorine sunset, “the gradual phase-out of the production and use of chlorine and organochlorines and the phase in of safer, chlorine-free alternatives” (Thornton 2000:13). According to Benford and Snow (2000), it is at this point where activists are likely to encounter oppositional or ‘counterframing’ activity, which may instigate defensiveness or require elaboration of prognoses or movement reframing. Unsurprisingly, the chemical industry did not respond favorably to Greenpeace’s prognoses and engaged in countermobilization strategies, which will be discussed further in the final section of this chapter.

The third and final core framing task is referred to as motivational framing (Benford and Snow 2000) and provides a “call to arms” or rationale for engaging in collective action. Motivational framing appeals to agency, a sense of efficacy or empowerment felt by movement activists and organizations. Also labeled ‘identity framing,’ this third task entails activists defining “who they are, usually as ‘we,’ typically in opposition to some ‘they’ who have different interests and values” (Pellow 1999:662). Gamson (1992) notes, “Without an adversarial opponent, the potential target of collective action is likely to remain an abstraction,” such as hunger, poverty or war (p. 7). Thus, “to sustain collective action, the targets identified by the frame must successfully bridge abstract and concrete” (Gamson 1992:33). By targeting ‘chlorine chemistry’ Greenpeace connected their concern, ‘hazardous chemicals’, with a concrete and appropriate source for action. Together, diagnostic, prognostic, and motivational framing are necessary for social movements to mobilize resources and challenge opponents.

Collective action frames reflect an organization’s core norms, values, and beliefs, and as Gamson notes, “are the outcome of negotiated shared meaning” (Reese and Newcombe 2003; Gamson 1992:111). Resonance, as mentioned above, reflects the consistency of a SMOs collection action frame with the interpretative frame of individual participants (Snow, et al. 1986). The greater the resonance or the believability of a particular frame for a targeted audience, the more likely SMOs will be able to motivate and mobilize those social actors to action. Resonance is also linked with the credibility of frame articulators. As Benford and Snow (2000) suggest, the greater the status and/or perceived expertise of the frame articulator and/or the organization they represent, the

greater the frame resonance. Various stakeholders in the PVC debates tactically adopt credibility strategies, aiming to either increase their own credibility, often through appealing to experts, and/or decrease the credibility of the opposition in the same manner or through more outright attacks.

Emergence and Overview of the Anti-PVC Movement History

Wave One

Mobilization around PVC concerns began predominately over occupational health concerns. These concerns emerged in 1975 when the American public first became aware of the deaths of four PVC workers due to angiosarcoma of the liver caused by vinyl chloride exposure in PVC production facilities. In the mid 1970s, concerns also mounted around occupational health risks for fire fighters exposed to burning PVC. At this time, fire fighters and their allies mobilized around growing fire safety concerns. Between 1975 and 1982, there were at least four major fires that exposed fire fighters to severely high levels of burning PVC. In 1975, 699 firefighters fought the New York Telephone Company fire, consuming clouds of toxic smoke from burning PVC insulation, leading some of them to develop respiratory diseases, cancers of the throat and larynx, and causing many others to retire on disability pensions. Referred to as the worst fire in the department's modern history, the firefighters union and their allies mobilized to change New York toxic exposure laws as well as institutionalize new measures for protecting and monitoring the health of firefighters (Lee and Singleton 1982). In 1982, the International Association of Fire Chiefs adopted resolution number four, which resolved,

That the IAFC strongly recommends that the issue of combustion toxicity be examined when considering national, state, and local building and fire codes and that scientific studies be undertaken to further clarify the role that such burning synthetics as PVC...play in firefighters' short and long term mortality rates (Greenberg N.d.).

Three major fire tragedies—the 1977 Beverly Hills Supper Club fire in Southgate, Kentucky, the 1978 Younkers Department store fire in Des Moines, Iowa, and the 1982 MGM Grand Hotel fire in Las Vegas—had occurred within a five year span in which the toxicity of the smoke from smoldering and decomposing plastics, PVC in particular, were responsible for the majority of fatalities (Greenberg). In a lawsuit filed after the Supper

Club fire, the plaintiffs' attorneys argued that the PVC wire insulation in the electrical system created toxic gases. Both the local utility company and PVC manufacturers settled before going to trial.

The MGM fire was the most controversial. According to Deborah Wallace (1990), a specialist on the impact of burning plastic on public health, "All parties involved in the litigation agreed that the fire originated in the electrical system in the back wall of kitchen" (p. 102). However, agreement ends there. Wallace describes an unusual burn damage pattern,

...most of the objects in that room [the kitchen] only had smoke damage. Paper announcements hanging on the walls showed no char at all...The major path of the fire...led up the wall to the plenum by way of the electrical installation. The plastic pipes in the plenum, as well as the electrical insulation, then carried the flames across the plenum¹ (Pp. 102-103).

The MGM Grand was twenty-six stories tall; of the eighty-five fatalities, sixty-one occurred on the top seven floors of the hotel, where the fire never reached. According to Wallace's account, toxic smoke from burning plastics, and PVC in particular, on the ground-floor casino spread throughout the air handling system, the elevator shafts, the seismic joints, the fire stairs, the electrical and plumbing systems, and even broken windows.

The MGM fire remains a source of contention between anti-PVC activists and industry and continues to reverberate and influence PVC's politicization. As reported to me by a leading representative of the vinyl industry, the industry continues to strongly disagree with the 'allegation' that vinyl was the cause of the fire. However, at the time, the mere charge that vinyl was a fire hazard caused enough concern in the industry to serve as a catalyst for the formation of the 'Vinyl Group' (now the Vinyl Institute), a trade association representing major manufacturers of vinyl, vinyl chloride monomer, vinyl additives, and vinyl packaging materials.

My vinyl industry contact remembers that it was following the MGM fire that anti-PVC activists began to emerge. Indeed, in the early 1980s, PVC's politicization became national in scope. For example, the California legislature passed a resolution

¹ A plenum is "an air-filled space in a structure; *especially* : one that receives air from a blower for distribution (as in a ventilation system)" (www.merriam-webster.com).

requiring the establishment of tests to determine the fire-gas toxicity and combustibility of materials used in building construction. Prior to this, the California Supreme Court ordered that the 1982 building code could not be distributed without including a warning about the health hazards of plastic pipe. In Chicago, after hearing testimony from toxicologists, the City Council voted to ban PVC as an approved building code material. And in New York, the Transit Authority decided to heed the warnings of health officials regarding the dangers of burning plastic and to discontinue the use of PVC electrical tubing in subway stations (Greenberg N.d.).

This period of politicizing the occupational and fire safety risks of PVC can be regarded as the first wave of the anti-PVC movement. For both of these sets of workers, vinyl production workers and fire fighters, mobilization emerged following a precipitating event. For production workers and their allies, the public discovery of the link between vinyl chloride exposure and cancer and other health problems prompted action. Fire fighters mobilized in response to a series of high profile fires in which fire fighters died and others were seriously injured from toxic exposure to burning PVC. Assuredly, the actions taken during this time have not been lost to history; however, in the current anti-PVC movement, concerns over occupational health are not given regular or prominent attention. At least for production workers, this is likely attributable to the OSHA imposed reduction in acceptable levels for vinyl chloride exposure. Some organizations, such as the Center for Health, Environment, and Justice, the Healthy Building Network, and Health Care Without Harm have supported and joined with community groups over environmental justice concerns where hazardous facilities (e.g., PVC production facilities or incinerators) are located, but this mobilization and support is not the primary purpose of their organization's anti-PVC campaigns. Fire fighters continue to be highly concerned about the hazards of PVC, but as a reflection of the current anti-PVC campaign's focus on market reform and education, fire fighters are not prioritized in these campaigns, much like vinyl production workers. Collectively, fire fighters are represented by a strong union, the International Association of Fire Fighters (IAFF), which prioritizes the occupational health of its members, but in general is not active in any coalitions of SMOs working to phase out or eliminate PVC. In essence,

while activists and participants in today's anti-PVC movement stress that the entire PVC lifecycle is marked by environmental and health problems, in actuality, it is the problems associated with the use and disposal stages that receive the most attention.

Wave Two

Following the events of the early 1980s there was a lull in the national anti-PVC movement. Concerns over PVC resurfaced in the early 1990s with the onset of Greenpeace's chlorine chemistry campaign. This second wave of the anti-PVC movement led directly into today's movement. In contrast to the earlier period of activism, Greenpeace framed PVC concerns primarily around issues associated with chlorine, a primary component of PVC. Greenpeace had expanded its toxics and organochlorine campaigns to focus on the whole field of chlorine chemistry. Organochlorines are a class of chemicals that contain one or more chlorine atoms with serious environmental and health implications. Rather than focus on one particular chemical, Greenpeace reasoned that because there were both known and suspected problems with all organochlorines, it made the most sense to ban all uses of chlorine. With over 11,000 chlorine-based chemicals in production, a study of the health and environmental impact of each chemical would take over 15 to 20 years to complete, making such a task impractical and ultimately unworkable.

According to Joe Thornton, a Greenpeace research analyst and research coordinator for the U.S. toxics campaign and the international chlorine campaign at the time, Greenpeace's goal was to stop the expansion of the hazardous waste incineration industry (interview). Greenpeace recognized that all forms of chlorine disposal would result in the release of toxic substances into the environment, thus their focus should be directed at the front end, at the production technologies that are reliant on hazardous chemicals. As noted above, framing the concerns around chlorine chemistry functioned to address production processes, use of toxic substances, and disposal concerns. As Thornton describes in an interview, chlorine chemistry was recognized as the sector of the chemical economy:

...that is responsible for the most hazardous, most persistent, most bioaccumulative set of pollutants. So, if we could deal with chlorine chemistry, we would deal in one fell swoop, with dioxins and PCBs and CFCs destroying the ozone layer and a huge number of pesticides that were a problem, and chlorinated solvents which were hazardous in the

workplace, so, that was the intent. It was a way of creating a concrete, but vastly sort of ambitious campaign focused on the production and use of toxic substances.

Greenpeace's campaign sought to frame production and disposal processes as environmental and public health problems.

Thornton was involved in the strategic development of the campaign and was the first person in North America to author a report on the topic of problems associated with organochlorines (interview, Thornton). In 1991, Greenpeace published *The Product is Poison: The Case for a Chlorine Phase-Out*, thus beginning the debate over chlorine chemistry in North America. (For a complete chronology of events, please see Appendix C.) According to Thornton, much of Greenpeace's work centered on the Great Lakes "where the effects of persistent organochlorines on wildlife and human health was becoming a major issue." Greenpeace partnered with activist organizations in the region around the decision-making of the International Joint Commission, an independent binational organization established in 1909 to "prevent and resolve disputes relating to the use and quality of boundary waters" between Canada and the U.S. (www.ijc.org). Thornton recalls, "[this] led to the IJC in 1993 saying that chlorine chemistry ought to be phased out and that became sort of springboard for continuing that campaign at a national scale in the U.S. and also in Canada as well."

Greenpeace, along with the IJC's support, created a cohesive frame for their issue closely mirroring the "framing tasks" framework laid out by Benson and Snow (2000). Together, the IJC and Greenpeace diagnosed the problem as chlorine and chlorine-containing compounds and sought a chlorine phase-out and an ultimate ban on chlorine as a prognosis. Greenpeace rationalized this by citing the IJC's recommendation to the U.S. and Canadian governments "to sunset chlorine-based chemical processes—including PVC manufacture—because of the threat to human health and the environment...." (Environmental Building News 1993). The IJC's recommendation provided greater credibility to Greenpeace's argument. In part, Greenpeace redefined what had previously been presented as primarily an occupational and fire safety problem into a problem that potentially affects the greater public. Their collective action frame linked environmental

health with human health, a connection that has continued with the framing used in the current anti-PVC movement.

As Greenpeace's campaign matured, the organization politicized PVC as a centerpiece of its larger chlorine chemistry campaign. Thornton explains, "we recognized that vinyl is the largest single use of chlorine...so it was a pretty obvious step that if you are an activist organization and you want to be campaigning on chlorine chemistry, vinyl has to be an important focus." This focus did not alter their attribution of what is to blame—chlorine chemistry—but by concentrating on PVC, they modified their tactics and targets. Their prognoses expanded; they recommended the EPA impose a moratorium on permits for new vinyl facilities, for expansion of facilities, and for new incinerators; modify permits at existing plants to require lowered dioxin emissions; phase-out medical and municipal solid waste incinerations, and begin rapid phase-outs of some PVC uses, including short-life PVC products (Duchin 1997). This change in their prognosis framing helped make a broad or intangible concern one that was publicly accessible and potentially more manageable, thus increasing the likelihood of a sense of efficacy among movement actors. By focusing on PVC, activists could direct their efforts to different stages of the PVC lifecycle and used the rhetoric² of endangerment to do. This rhetorical idiom presumes that "individuals have the *right* to be safe from harm, to have good health, and to be shielded from preventable or reducible types of bodily risk (Ibarra and Kitsuse 1993:35, emphasis in original). Greenpeace's use of endangerment rhetoric becomes apparent with the publication of their 1997 report, *Dioxin From Cradle to Grave*, where they introduced terms into the PVC discourse with loaded language, such as, 'toxic burden,' 'poison plastic,' and 'toxic lifecycle'.

Greenpeace strengthened its framing by using another tactic that would become a mainstay of both vinyl opponents and supporters. Benford and Snow (2000) note that the credibility of any framing is affected by the credibility of the frame articulators (2000). In this case, the call to phase out chlorine chemistry had become embraced by a larger constituency. Other organizations and community groups joined with Greenpeace in their efforts to politicize PVC. Physicians and public health activists also joined with

² "Rhetoric", here, refers to the deliberate use of language to persuade others (Taylor 2000a:510).

Greenpeace to bring the issue to the attention to the American Public Health Association where, in 1994, the APHA passed Resolution 9304 advocating the phase out of chlorinated chemicals in most applications, except for water disinfection and pharmaceuticals (Cap 1996). Religious organizations, cities, and city councils passed also passed resolutions. As Benford and Snow (2000) suggest, the greater the status and/or perceived expertise of the frame articulator, the greater the credibility of organization's framing. The passage of resolutions by religious organizations and medical associations helped to convey a sense of legitimacy and also lend some authority to the credibility of Greenpeace's claims. According to Starr (1982) authority "signifies the possession of some status, quality, or claim that compels trust or obedience" (p. 9). The use of authority relies on 'legitimacy' and 'dependency' as sources of effective control. Legitimacy and dependency also serve as reserves of persuasion when authority fails. Physicians and other professionals are able to claim cultural authority, whereby their authority is granted "not as individuals, but as members of a community that has objectively validated their competence" (Starr 1982:12). Physician involvement thus lent authority to Greenpeace's health arguments.

Environmental Justice

Greenpeace also began working in the Gulf Coast in Louisiana and Texas with those communities most immediately affected by vinyl production feed stocks. Greenpeace was then able to tap into an existing grassroots network of local organizations. Incorporating an environmental justice component was an astute tactical decision for the organization. In her work on the framing processes of the environmental justice movement, Taylor (2000a) observes that because the movement is multiracial, it has been able to avoid some of the "divide-and-conquer" strategies of countermobilizations (p. 562). As a largely middle-class and white environmental organization, had Greenpeace's decision to politicize PVC emphasized only the health of the environment and not the health of people, the organization would have been susceptible to external criticisms as promoting an elitist environmental agenda (see Bullard 1994b; Taylor 2000a). The degree to which Greenpeace truly addressed environmental inequality is debatable; however, what is important is that Greenpeace

projected a message that the vinyl industry “is a glaring example of environmental racism and injustice” (Duchin 1997), thus encouraging their opponents to perceive the movement as broad-based and human-centered.

Efforts towards politicizing PVC began to have visible successes. In 1997, Greenpeace was still active in the movement when Shintech, the U.S. PVC subsidiary of Shin-Etsu, the world’s largest PVC producer, sought to build a new PVC plant in St. James Parish, Louisiana. In an “unprecedented decision”, the EPA decided to overturn a permit allowing the company to build the facility (Tremblay 2002:19). Claiming environmental racism, community activists organized St. James Citizens for Jobs and the Environment and joined with other local and regional organizations to challenge the siting of the new PVC plant. Expansion of its coalition base was an effective strategy for gaining national attention to the issue and legitimizing the cause (Hines 2001). On behalf of 19 organizations, Greenpeace and the Tulane University Environmental Law Clinic filed both a federal claim and a state lawsuit contending the facility would violate the “disparate impact” clause of Title VI of the Civil Rights Act and would also violate the Clean Air Act. Title VI bars racial discrimination by entities receiving federal funds. The complaint stated that a permit issued to Shintech would be racially discriminatory under Title VI.

Activists and their supporters framed the case as setting a national precedent for the environmental justice movement. The broadness, inclusivity, flexibility, and cultural resonance of the “environmental justice” frame, positions it as a master frame, and thus contributes to the mobilizing potential of SMOs (Benford and Snow 2000). Collective action frames with broad interpretative scope, appeal, and utility for at least two distinct social movements can sometimes become master frames. ‘Environmental justice’ has emerged as a master frame for activists seeking to link racism, injustice, and environmentalism in one frame (Taylor 2000a). By using the EJ master frame, grievances were not solely directed at Shintech, but at a larger institutionalized system of racism and environmental injustice. Pointing to the predominance of chemical facilities and refineries already in the area, the clear prognosis for activists was to prevent the construction of the facility. Residents mobilized out of concern regarding increased

threats to their health. Shintech rejected these charges and ultimately “sidestepped the activists,” deciding to build its new PVC facility in Addis, Louisiana, where Dow Chemical supplied the needed vinyl chloride (Tremblay 2002). While the company chose not to engage in a drawn out framing contest, Shintech CEO, Chihiro Kanagawa, responded to the EPA decision by dismissing the credibility of the activists’ framing, asserting, “It was politics, nothing but politics... The state of Louisiana, the local government, gave us full support. They issued the permits” (Tremblay 2002:19).

EPA Draft Dioxin Reassessment

A key turning point for the movement occurred in 1994 when the U.S. Environmental Protection Agency released a draft Dioxin Reassessment identifying medical waste as the single largest source of dioxin air pollution. The draft consisted of two documents, each over 1,000 pages long, on the health effects of dioxin, the sources of dioxin, and the levels to which the population has been exposed (Gibbs 1995). At this time, there were over 6,000 medical incinerators in use in the United States. The EPA Reassessment provoked a firestorm of activity over the course of the next several years. In 1995, Citizens Clearinghouse for Hazardous Waste (now CHEJ), led by Lois Gibbs, kicked off their Stop Dioxin Exposure Campaign. Forty citizen activists, scientists, and representatives of national organizations gathered in April to plan the national campaign with the goal of “a sustainable society in which there is no dioxin in our food or breast milk because there is no dioxin formation, discharge, or exposure” (Gibbs 1995:xix). In *Dying from Dioxin: A Citizen’s Guide to Reclaiming Our Health and Rebuilding Democracy*, Gibbs encouraged activist coalitions to engage in targeted consumer boycotts of PVC and other chlorine-based products. The organization has revisited these strategies in its current PVC campaign.

In the mid 1990s, Greenpeace experienced the beginnings of a restructuring and by 1997; \$8 million was cut from its budget (Chemical Week 1997). According to Joe Thornton, “Greenpeace went through a financial and political crisis,” thus leading Greenpeace to deemphasize its work against chlorine chemistry. The downsizing at Greenpeace coincided with the formation of Health Care Without Harm, currently a core movement adherent. To some extent, HCWH filled the gap in toxics work left by

Greenpeace. Specifically, HCWH formed in response to the EPA Dioxin Reassessment draft, organizing to directly address the problem of medical waste incineration. HCWH recognized that the incineration of vinyl plastics was one of the reasons medical waste incinerators were such high dioxin producers, and thus took a two-pronged approach. According to HCWH's Communications Director, Stacy Malkan, "we [HCWH] started with the waste and then looked upstream, how can we first of all, stop hospitals from burning so much waste. And second of all, [HCWH aimed to] reduce the toxicity of the waste. So that they are not disposing of highly toxic chemicals." Having diagnosed the problem as the incineration of medical waste, the organization's clear prognoses involved shutting down these incinerators, while emphasizing that this goal should not be met by simply transferring the problem to other locations or countries. As HCWH became incorporated into the anti-PVC movement, a shift in the framing of PVC lifecycle concerns occurred which emphasized the role of the health care industry in contributing to these problems. HCWH was able to build on Greenpeace's close work with physicians to create their initiative on PVC. In this sense, even though Greenpeace's involvement in the movement dramatically decreased over time, their efforts continued to influence the movement.

Movement Growth

The mid- to late 1990's were the formative years of the anti-PVC movement. Thus, there was a greater degree of consciousness raising and public position taking during this time than is prevalent in the movement today. The passage of resolutions or taking formal positions on dioxin or PVC use in health care continued as a way to express commitment or support for the concerns of the movement. In 1996, the American Public Health Association followed up its 1994 resolution on chlorinated chemicals, with the passage of Resolution 9607, calling for the phase out or elimination of PVC in healthcare. Other city and state medical associations and societies followed suit. At this time, several sizable and notable medical societies passed resolutions or took formal positions against PVC. The American Nurses Association House of Delegates passed a resolution for the "Reduction of Health Care Production of Toxic Pollution," targeting medical waste. The International Council of Nurses released a position statement on "Medical Waste: Role of

Nurses, and Nursing” (1998), and the American Medical Women’s Association passed a resolution called “Dioxins and Medical Waste Incineration” in November 1999. Additional religious organizations, cities and city councils passed official resolutions against PVC, further building momentum and increasingly the credibility and resonance of the movement.

The additions of reputable medical societies and religious organizations to the anti-PVC movement complicated the countermobilization efforts of the vinyl industry. First, the greater the degree of prestige or legitimacy of social movement organizations or activists, the more risky any counteraction becomes for the opposition. Jasper and Poulson (1997) note that in the range of strategies a targeted entity may deploy in response to public criticism, should it “blunder,” the organization’s “reputation for competence, honesty, or benevolence” may be weakened (p. 398). In this case, if the vinyl and chemical industry appeared to be attacking physicians, nurses, or religious organizations, their strategy may backfire and help to create sympathy for the movement. The vinyl industry must carefully avoid “blundering” as it argues for the safety of PVC against professionals whose jobs rests on their knowledge of health.

By the late 1990s, the anti-PVC movement began to more closely resemble the movement as it stands today. At this time, health care professionals had become more involved, phthalate concerns had fully merged with PVC concerns, and HCWH had begun to play a greater role in the framing process. In 1998, HCWH released a study concluding that phthalates could harm multiple organs and interfere with sperm production. In November 1998 the Canadian government’s health service, Health Canada, issued a parental advisory on PVC toys containing the plasticizer diisononyl phthalate (DINP). Over the course of the next 12 months, many countries imposed restrictions on phthalate containing PVC toys, including Austria, Canada, Denmark, Finland, Mexico, Norway, the Philippines, Germany, France, Greece, and Sweden. Meanwhile, in the U.S., Greenpeace and eleven other consumer, public health, environmental and religious organizations petitioned the U.S. Consumer Product Safety Commission (CPSC) to ban all vinyl toys for children under the age of five. On December 2, 1998, the CPSC issued a voluntary ban on young children's teething and

rattles made of PVC plastic containing phthalates such as DINP, the primary plasticizer in PVC toys. More than a decade earlier, in 1986, at the bequest of the CPSC, the toy industry voluntarily consented to limit their use of the phthalate DEHP. At this time, phthalates had clearly emerged as part of the PVC problem.

By spring of 1999, Greenpeace had teamed up with Health Care Without Harm and began switching their focus from PVC toys to PVC medical devices. Phthalate risks remained central to the debates and were reflected in activists' diagnostic framing. The two organizations drew attention to the potential risks to patients from DEHP leaching out of medical bags. Their framing was challenged in 1999, when former U.S. Surgeon General C. Everett Koop led an American Council on Science and Health (ACSH) scientific panel reviewing the safety of phthalate plasticizers. The non-peer reviewed report, "A Scientific Evaluation of Health Effects of Two Plasticizers Used in Medical Devices and Toys" (1999) contradicted the results of a study released the previous summer by HCWH. The ACSH report reviewed DEHP and DINP and stated that there was no scientific evidence that either is harmful to adults or children, thus concluding that both vinyl toys and IV bags containing these phthalates were safe.

The ACSH committee's conclusions were highly controversial. HCWH's Stacy Malkan states the panel's findings have subsequently been "discredited and debunked". Although, the Vinyl Institute, "certainly bandied it about and still do." Critics questioned the legitimacy of the panel's findings, given ACSH's strong financial ties to industry. ACSH receives 76% of its funding from corporations, including chemical manufacturers (Sissel 1999a). In the past, the organization's leanings towards industry have included: discrediting concerns about lead poisoning, claiming dry cleaning agents are not a health threat, and opposing stricter EPA air pollution standards (Environmental Building News 1999). Indicating its industry leanings, Elizabeth M. Whelan, ACSH president, recently condemned the cereal maker Kellogg for acknowledging the nutritional deficiencies of their popular sugar cereals. Whelan censured corporations, like Kellogg, for "acting more politically correct than ever, joining whenever they can with their harshest critics. They

are appeasing their foes -- and abandoning science in the process” (www.asch.org).³ Whelan’s comments point to two commonalities of contested environmental health problems evident in the PVC debates: charges of questionable science and the mixing science of and politics.

Agin (2006) calls this ‘junk science,’ “...extensively corrupted science, science corrupted in objectivity and/or method, the corruption either deliberate or involving sloppy methods or due to ignorance of what science is about” (p. 4). In HCWH’s review of the ACSH panel’s analysis of DEHP’s toxicity, they charge ACSH with both questionable scientific integrity and questionable “intellectual rigor and honesty” for a selective and misleading review of the literature, misrepresenting evidence, and for claiming a cited study reports a finding that the study does not address or report in the published manuscript (Schettler 1999:1-2). In the same way that ‘experts’ are used to strengthen the claims or arguments of movement stakeholders, they may also be used to discount the claims of opponents or disparage the other sides’ ‘experts.’

The Center for Health, Environment, and Justice

Meanwhile, CHEJ continued with its *Stop Dioxin Campaign*. In a chemical industry exposé, *Behind Closed Doors* (2001), CHEJ documents their account of a pattern of counter mobilization by the chemical industry. They accused the Chlorine Chemistry Council (CCC), the American Chemistry Council (ACC), and the Vinyl Institute (VI) of attempting to block resolutions against dioxin in San Francisco and Oakland, contending these actions were part of a larger “attack to gut any report or policy that would eliminate dioxin or adopt a precautionary approach” (CHEJ 2001). In addition to targeting local resolutions like those in the Bay area, CHEJ maintains the industry’s prime target has been the U.S. EPA’s dioxin reassessment. CHEJ holds the chemical industry and the CCC in particular, responsible for the delay of the

³ For a survey of what ACSH considers ‘junk science,’ their Top 10 list of unfounded health scares of 2007 are: 1. Trans Fats Are a Major Cause of Heart Disease 2. Benzene in Soft Drinks Causes Cancer 3. High Fructose Corn Syrup Triggers Obesity 4. Mercury in Tuna Threatens Health of Women and Babies 5. Nitrosamines in Bacon Cause Bladder Cancer 6. Teflon Contains a Cancer-Causing Chemical 7. Grilled Chicken Contains Dangerous Levels of Carcinogens 8. Meat Packaging Process Poses Risk to Consumers’ Health 9. Cosmetics Will Give You Cancer 10. Traces of Chemicals in Plastic Pacifiers, Rubber Duckies, and Car Seats Pose a Cancer Risk to Babies (www.asch.org).

reassessment through a variety of stalling tactics.⁴ CHEJ's (2001) report calls into question the credibility of the chemical industry through charges that the industry "methodologically and strategically" attempted to influence policy makers and to mislead and conceal information about the health impacts of dioxin from the public. According to CHEJ's estimation, about one third of the EPA's Science Advisory Board (SAB) dioxin review subcommittee had received funding from one or more of ninety-one dioxin polluting corporations, violating U.S. government conflict of interest regulations.

CHEJ demonizes the chemical industry, comparing their tactics of deceit and "backdoor influence" with those of the tobacco industry. They emphasize that their organization is a "network of hundreds of environmental justice groups, religious leaders, health care professionals, scientists and health impacted groups, representing thousands of people across the country" (CHEJ 2007). In other words, CHEJ frames itself as representing 'the people' motivated by concerns of public health while they frame their opponents as solely interested in their bottom line and doing everything they can to protect it. In this regard, CHEJ is one of the few anti-PVC SMOs that intentionally diagnostically frame the chemical industry as the source of blame for PVC. Given that the other organizations work within the system, attribution of blame is often more 'vague.' This is not necessarily true for individuals in the movement; in fact, many of my interviewees expressed their aversion to and distrust of the vinyl industry. However, as I discussed in the previous chapter, the health care branch of the movement is representative of a PIHM and PIHM organizations are characterized by participants' position in the class structure as professionals and their distant relationship from the means of production. On the other hand, from its inception, CHEJ has framed itself as the only national environmental organization aiding community grassroots organizations. CHEJ's prognostic framing and anti-PVC campaign compliments the public health advocacy efforts emerging from the health care industry, but with the anti-PVC PIHM's focus on health care professionals, it does not really join CHEJ in emphasizing the involvement of community groups.

⁴ CCC is the division of the trade association the American Chemistry Council that works on policy issues.

CHEJ's current campaign frames the PVC issue largely as a problem of consumption. On their website, they list the "Top Ten Ways to Take Action for Safe Consumer Products", motivating concerned citizens or activists to take fairly simple, reasonable actions to reduce the usage of PVC.⁵ Because these actions require little effort, but seem attainable, accomplishing some of these goals are likely to contribute to a movement member's sense of efficacy and agency. Like Greenpeace, CHEJ invokes the rhetoric of endangerment, also referring to PVC as 'the poison plastic' in reports, newsletters, banners, and marketing materials. In their marketing campaign, CHEJ primarily targets companies that use PVC in their consumer packaging or products. Commenting on the success of CHEJ's approach, a former activist in the movement observes:

...they are sort of picking fairly low hanging fruit in that sense. Because to get Nike to not use vinyl anymore, it's not that hard for Nike not to use it. But, in a sense, that makes a good first, a good early part of the campaign, because you want to have success and then you have Nike on your side, helping to publicize the fact that they've done a good thing for the environment by not using vinyl anymore. And it's a way of connecting with consumers as well. So, the building and health care uses, that is going to be very difficult to extend there. There's no natural connection from that work to consumers. But companies that make consumer products and packaging, that's the level of which you can educate the general public about these matters.

As noted in this observation, in part CHEJ's strategy is to publicly 'shame', or contrarily, to positively 'recognize' companies based on their PVC consumption. As will be discussed in greater detail in the subsequent chapters, this approach is unlike the anti-PVC movements in health care and green building, where the debates largely play out within their respective industries.

CHEJ uses a variety of tactics in its anti-PVC campaign, including: planning demonstrations, PVC Day(s) of Action, organizing media events/media coverage, issuing reports and newsletters, holding conferences, and working on state and local precautionary-based and/or purchasing policies. The organization recognizes the importance of the framing process. In an article on effective strategies for consumer

⁵ These actions include: 1) Sign up for the PVC Action Network, 2) Tell a Friend, 3) Purchase safe, PVC-free products, 4) Endorse the campaign, 5) Help build and spread the word about the campaign, 6) Organize a Blue Vinyl screening, 7) Pass a local PVC-free purchasing resolution, 8) Participate in a media event or day of action, 9) Write a letter to the editor, and 10) Educate yourself.

campaigns, PVC campaign coordinator Mike Schade recommends that when diagnosing the problem, it is important “to focus on companies with strong brand identity” because those companies “are vulnerable to negative media attention” (2006:5). With regards to motivational framing, Schade encourages “using powerful value-based messages that resonate with your audience” (Schade 2006:5). CHEJ’s tactics and framing of the PVC problem thus reflect the difference in their prognoses and audience compared with those organizations working predominately in health care and green building.

Regulation and Phthalates

The politics of today’s anti-PVC movement have been shaped by incongruity in government regulation. The movement’s success on a federal regulatory level has varied across agencies. While the actions of the U.S. Food and Drug Administration have indicated increasing government concern over DEHP, the U.S. Consumer Product Safety Commission conveys a conflicting message. In October 2000, the U.S. Department of Health and Human Services’ National Toxicology Program, Center for Evaluation of Risks to Human Reproduction (NTP-CERHR) released its expert panel report on DEHP. In 2002, the FDA released a Public Health Notification, “PVC Devices Containing the Plasticizer DEHP” with little publicity, but was widely viewed as significant among activists. The impact of FDA notification is discussed in greater detail in chapter five. In the same year, the FDA released draft guidance for industry to voluntarily label some PVC medical devices containing DEHP. Also in 2002, the CPSC released a report finding that DINP exposure risks to children were lower than previously estimated. In 2003, the CPSC voted unanimously to deny a petition by Greenpeace, the U.S. Public Interest Research Group (PIRG) and ten other environmental groups to ban the use of phthalates in toys aimed at children age five and younger (Franz 2003).

Proposition 65

Movement activists and SMOs continued to frame PVC as a lifecycle problem; however, by the beginning of the 2000’s, DEHP become central to the disputes over PVC’s safety and intertwined with PVC’s politicization. As the only phthalate approved for use in medical devices, DEHP concerns became increasingly important as the debates

around PVC shifted to its prominence in the health care industry. At the federal level, anti-PVC activists may have been having mixed success, but in 2003 California took the lead in regulating PVC. In October, the Office of Environmental Health Hazard Assessment (OEHHA) of the California Environmental Protection Agency added DEHP to Proposition 65, a list of chemicals “known to the State to cause reproductive toxicity” (www.oehha.org). Proposition 65, or more formally, the Safe Drinking Water and Toxic Enforcement Act of 1986, requires OEHHA to compile a list of chemicals known to the state of California to cause cancer or reproductive toxicity. Once listed, manufacturers have one year to label products with a warning to all potentially exposed parties. The decision to list DEHP was based on the authority of the National Institute for Occupational Safety and Health (NIOSH) and the FDA. It was supported by core and semi-periphery organizations in the anti-PVC movement (i.e., Catholic Healthcare West, Health Care Without Harm, Healthy Building Network, Oregon Center for Environmental Health, Physicians for Social Responsibility, American Academy of Pediatrics, etc.) as well as a number of state organizations, physicians, pediatricians, public health specialists, and concerned citizens (Index of Comments 2003). California’s decision to include DEHP under Proposition 65 was strongly contested by industry. In particular, Baxter Healthcare Corp., a leading manufacturer of IV systems, retained legal counsel to challenge the inclusion of DEHP. The industry’s counter strategies to oppose the inclusion of DEHP under proposition 65 are discussed further in the following sections.

World Health Organization & International Agency for Research on Cancer

The politics of PVC intensified as debates shifted to a more international level with DEHP emerging as the center of charges of industry influence on scientific decision-making directed at the highest levels of public health deliberations. The World Health Organization’s (WHO) International Agency for Research on Cancer (IARC) is generally recognized as the leading global public health institution for evaluating the carcinogenicity of chemicals. IARC Monograph Working Groups are interdisciplinary teams of expert scientists whose role is to review published studies and evaluate the weight of the evidence that an agent can increase the risk of cancer. They decide the

carcinogen status of chemical products; thus, their judgments have enormous implications for public health and are extremely influential in government chemical regulation. In fact, Baxter's 2002 decision to challenge DEHP's Proposition 65 listing appears to be principally motivated by IARC's decision to downgrade DEHP from "possibly carcinogenic to humans" to "non-classifiable as to its carcinogenicity to humans."

This decision was highly controversial with movement protagonists charging the IARC with having conflicts of interest, suffering under undue industry influence, lacking transparency, and suppressing evidence that conflicted with the decision to downgrade DEHP. The dispute played out in the commentary section of the *International Journal of Environmental and Occupational Health* (IJEHO) over the course of 2002 and 2003. *The Lancet* (2002) also editorialized on the IARC, writing, "It only needs the perception, let alone the reality, of financial conflicts and commercial pressures to destroy the credibility of...(the) IARC and its parent, WHO" (p. 189). These charges were embedded within a larger attack on WHO leadership, secrecy surrounding electoral procedures for its Director General, and criticism of the selection process for the IARC director. In this way, the diagnostic framing of PVC and DEHP problems broadened in scope from focus primarily on the environmental and health concerns associated with PVC's lifecycle to also identify industry influence and scientifically questionable evaluations as part of the problem.

Scientific Experts & Industry Influence

Along with this shift in framing came increased involvement of scientists and public health professionals who were equipped with the language, knowledge, and status to engage in these politicized scientific debates. In 2002, thirty scientists, including a former IARC director, Lorenzo Tomatis, united to publicly question the integrity of the IARC over its downgrading of DEHP. In one IJEHO editorial, James Huff (2003), a former IARC Monographs programme chief and current National Institute of Environmental Health Sciences (NIEHS) Associate Director for Chemical Carcinogenesis, voiced the frustration expressed in many letters:

I find it disturbing that chemicals that the IARC had downgraded to categories of lesser human health concern in the last few years have been those widely used in production

and of enormous economic importance. Does this reflect industry's skill and their scientific lobbyists' acumen, the influence of the industry-skewed invited participants of the IARC Working Groups, and/or the industry slant of recent IARC leaders? (P. 403).

DEHP public health concerns cannot really be separated from PVC concerns. While DEHP is used in many non-medical applications, as the only FDA approved phthalate for medical devices, the disputes over Proposition 65 and the IARC decision point to the challenges faced by environmental health activists when the lines between regulatory bodies, industry interests, and science are blurred.

The question arises, who is an expert? What role are they allowed to play in the development of scientific policy and regulation? Scholars within the sociology of science have theorized on the lack of neutrality in science and the objectivity of scientists, critiquing the exclusion of multicultural standpoints, feminists' theories and research, and lay knowledge (Harding 1991; Brown, 1992; Hess 1997; 1998; Messing 1998; Krinsky 2003). IARC working group members are reportedly chosen for their scientific expertise. This also includes industry consultants who are allowed to participate in panel deliberations, although their participation may be limited. Critics urge the WHO to include a broader diversity of scientists in expert panels as participants and not merely as observers (Axelson et al. 2002). In particular, they advocate inclusion of scientists from nongovernmental organizations independent of industry. Like the professional members of the PIHM discussed in the previous chapter, WHO critics are not the disenfranchised, but are physicians, scientists, and researchers within government bodies, including the NIEHS and the California EPA, as well as professional activist oriented organizations, such as HCWH and the Science and Environmental Health Network.⁶ The professional status of these social actors increases credibility of their arguments for this audience. Through their framing, the political and economic influence of industry becomes more apparent.

⁶ There are no neutral and conflict-free bodies. While Huff and other government employees are public health advocates, these agencies are as susceptible to misconduct as the IARC. In August 2007, NIEHS Director David Swartz temporarily stepped down while the National Institute of Health conducts a comprehensive review of management and ethical issues. This action is on top of a Congressional investigation into Swartz's industry ties and conflict of interests regarding bisphenol A, questions about Schwartz testifying in asbestos trials, and about his circumvention of normal hiring practices at NIEH (Nesmith 2007; Hileman 2007).

Sass, Castleman, and Wallinga (2005) decry commercial influence on EPA public health policy. In particular, they criticize the role and use of industry employees as peer reviewers and as consultants in vinyl chloride assessment, while unions and public interest groups were omitted from the process. They further condemn the EPA's increasing reliance on industry involvement in the regulatory process "in an effort to reduce the agency's review times" (Inside EPA 2004, cited in Sass et al. 2005:810). In their book, *Toxic Deception: How the Chemical Industry Manipulates Science, Bends the Law, and Endangers Your Health*, Fagin, Lavelle, and the Center for Public Integrity (1999) hold nothing back in their critique of the tactics chemical manufacturers will use to set the agenda and steer the direction of research:

They can cheat. They can manipulate research results. They can create front groups, co-opt academic researchers, and attack independent scientists. Each kind of scientific manipulation by the chemical industry is, in its own way, effective in warding off regulators and keeping dangerous products on the market (P. 69).

SMOs and medical reformers have pointed out the gendered, racialized biases within the medical profession and scientific research, but equally important is industry bias that critics contend prevails in the public health policy process.

Franklin Mirer, Director of the Health and Safety Department of the United Auto Workers (UAW), the sole labor representative in the IARC DEHP Working Group, contends discourse was dominated by those seeking DEHP downgrading, including the industry observers (Mirer 2003). Of broader consequence however, is his summarization of how industry is able to dominate the research agenda of economically important chemicals. To paraphrase, Mirer argues that industry and its network are able to significantly influence the production of scientific data through the use of highly sophisticated research techniques and research campaigns that both provide and publish results which conclude that human risks from any economically important chemical are non-existent or lower than previously data has found. In effect, as this strategy relates to the IARC working groups, the chemical industry or its advocates conduct the studies that they then use to argue warrant chemical downgrading, as in the case with DEHP.

In contrast, university-based investigators confront a number of barriers hindering expedient research and publication, including competition for grants, long lead times for

grant applications and funding, and lack of guarantees for continued funding as research progresses (Mirer 2003). Moreover, the persistence of financial difficulties for universities since the 1980s has resulted in an increasing dependence on industry funding for research raising additional questions about conflict of interest and researcher autonomy within academic-industrial relations (Geiger 1988). Academics are also recruited for joint research projects with industry and to serve as third party spokespersons for delivering positive messages on behalf of industry (Harden and Walker 2003). For different reasons, government laboratories are also unable to counter industry's influence. Unlike industry research, which is generally driven by immediate economic concerns and specific agents, government laboratories are often oriented around longer-term questions. As Mirer (2003) concludes, industry domination of economically important chemicals poses a tremendous threat to public health.

Politicization of PVC put increasing pressure on government agencies to investigate some of the charges lodged by PVC critics. In October 2005, for the first time in its history, the National Toxicology Program (NTP) Center for the Evaluation of Risks to Human Reproduction (CERHR) reconvened an expert panel of independent scientists to update a previous evaluation. In this case, the chemical was DEHP, which had first been evaluated in 1999-2000. However, since that time, approximately 150 papers relevant to human exposure and reproductive and/or developmental toxicity of DEHP had been published. According to the meeting summary, "The CERHR decided to update the evaluation of DEHP because of: (1) widespread human exposure, (2) public and government interest in potential adverse health effects, and (3) the large number of relevant papers published since the earlier evaluation (NTP-CERHR 2005). CERHR expert panels express levels of concern as negligible concern, minimal concern, some concern, concern, and serious concern (NTP-CERHR 2005). Based on available scientific research, the expert panel found a range of concern from 'some' to 'serious' for healthy infants and toddlers, critically ill infants, and pregnant and lactating women.⁷

⁷ The expert panelists reviewed and evaluated the available scientific evidence on DEHP in three primary areas: human exposure, reproductive toxicity, and developmental toxicity. Unchanged were their "minimal concern" regarding general population exposures adversely affecting adult human reproduction, their "serious concern" that DEHP exposure from medical exposures may adversely affect male reproductive

This range of degree of concern enabled different stakeholders to use the CERHR's findings both to strengthen their own arguments and convey legitimization from an authority. For PVC opponents, concern validated their claims, whereas vinyl supporters emphasized that only particular populations are potentially affected.

Counterframing and Counter Strategies

In the previous section, I summarized some of the primary conflicts, major points of contention as well as successes in the politicization of PVC: production worker exposure to vinyl chloride monomer, fire fighters and fire safety, the IJC decision and the call for a chlorine and PVC phase-out, passage of PVC and dioxin resolutions, federal policy decisions and regulations, environmental justice concerns, phthalate concerns, the ACSH report, Proposition 65, and the IARC.

The social, political, environmental, and health claims of anti-PVC organizations obviously do not go uncontested. The plastics and chemical industries challenge their opponent's diagnostic and prognostic framing through their own counterframes. Benford (1987) defines counterframes as "attempts to rebut, undermine, or neutralize a person's or group's myth, versions of reality or interpretative framework" (p. 75). Counterframes are attempts to shift the debate and dismiss opponents, their logic, and their solutions. Because countermobilization efforts are aimed at preserving the status quo, attempts are made to resist or reverse the social changes sought by social movements (Taylor 2000a). Industry and the anti-PVC movement engage in "framing contests" (Ryan 1991) as different stakeholders reframe their concerns in response to opposing claims. Industry primarily uses five interconnected counterframes, including reframing the issue as serving a public good, reframing as a non-problem, scientific framing, marginalization, and framing as economic harm. The framing activity of industry influences their five main counter strategies targeting the anti-PVC movement: counterrhetorics, non-problematizing, scientific arguments, credibility strategies, and direct action strategies.

Counterrhetorics are discursive strategies used to block either the attempted characterization of the problem or the proposed solutions (Ibarra and Kitsuse 1993).

tract development and function. A reduction of concern to "some" for the effects of DEHP on male offspring of humans exposed during pregnancy (NTP-CERHR expert panel 2005).

Counter rhetorics are rarely used by themselves, but rather are used in conjunction with other strategies. Ibarra and Kitsuse (1993) describe two classes of counter rhetorics: (1) sympathetic counter rhetorics, which fully or partially agree with the diagnostic frame, but not the prognostic frame; and (2) unsympathetic counter rhetorics, which accept neither the diagnosis nor the prognosis.⁸ Throughout the PVC debates, the plastics and chemical industries have relied largely on unsympathetic counter rhetorics, minimizing or outright rejecting environmental and health problems associated with PVC. The industry's counter frames and strategies are interconnected and at times overlap. Each of these strategies has its own themes, which are discussed in detail and in conjunction with counter frames below.

Counterframe: PVC Serves a Public Good

The counter frame, 'serving the public good,' can assume various forms depending on the challenger's diagnostic and prognostic framing. Following the IJC's recommendation for a chlorine sunset, the industry sought to reframe the controversies surrounding chlorine into public health issues as well, but from a significantly different perspective. The IJC declaration carried significant weight and a potentially damaging impact to the chemical industry, impelling the use of scientific arguments and attempts to marginalize and discredit their opponents as counter strategies. In response to the IJC declaration, industry and its supporters touted chlorine's benefits in hyperbolic fashion, "From safe drinking water, clean swimming pools and pest-free crops, to flame retardants...the end of chlorine would spell the end of modern civilization itself" (Malkin and Fumento 1996:21). Embedding chlorine protectionism within health and safety rhetoric is a purposefully misleading tactic directed at gaining the public's sympathy while deriding chlorine opponents for their 'apparent' disregard for human health. In this way, their message is intended to persuasively resonate (Klandermans 1992) with the public's dislike of 'environmental extremism' while also appealing to their moral regard for the public's welfare. Such a strategy willfully muddles science and attempts to equate public and environmental health with economic well-being; thus attempting to establish

⁸ Ibarra and Kitsuse (1993) use 'condition-categories' to denote "the terms used by members to propose what the social problem is 'about'" (p. 26)

an analogical perception of ‘good’ equals chlorine; ‘bad’ equals environmental extremists. In essence, the objective is to separate the tree from the forest. By redirecting their opponent’s arguments *away from* the health and environmental impacts of chlorine *to* the health benefits of chlorine, they strategically reframe the benefits of chlorine as the issue, and not chlorine chemistry and its associated negative industrial environmental and health impacts.

As momentum to phase out and ban certain applications of PVC grew, the industry’s countermobilization tactics intensified. In 1999, the Vinyl Institute and the Chlorine Chemistry Council jointly conducted a \$1 million dollar public relations campaign to promote the benefits of PVC. The campaign was not targeted at the general public, but rather was directed at policy-makers and specific markets for PVC (construction, health care, and toys) (Toloken 1998). The leader of the campaign commented, “What it boils down to is the chlorine and vinyl industry decided we needed to be more proactive. Instead of continuing to just defend on the issues, we want to talk about the benefits of the products” (Toloken 1998:43). This strategy involved placing pro-PVC ads in the National Review and in Washington D.C. newspapers; the Washington Post and Roll Call, a newspaper circulated primarily on Capitol Hill. Cable television ads promoted the role of PVC in health care, through depicting a group of doctors and nurses in an operating room surrounded by PVC IV bags, tubing, and respiratory equipment. The ad states, “medical professionals have placed their trust in one material time and time again: vinyl” (Cray 1999). This campaign was not a response to a specific assault, but a more generalized response to reframe the PVC debates such that the public benefits of PVC are emphasized and conveyed to those in a position to make financial or regulatory decisions about PVC. Strategically, the VI and the CCC’s use of medical professionals served to increase the perceived credibility of their message.

Counterframe: Non-Problem

In the politicization of PVC, industry turned to familiar tactics used by protagonists in other environmental social movements. Similar to counterclaims outlined partly by Schnaiberg (1994) elsewhere, McCright and Dunlap (2000) identify three counter-claims in their analysis of the conservative movement’s challenges to the

legitimacy of global warming.⁹ Substituting the environmental and health risks associated with the PVC lifecycle (chlorine, dioxin, etc.) for global warming, we can see a pattern of argument employed by economic interests that transcends any one particular environmental problem. The first counter-claim “argues that the problematic condition does not exist,” by pointing to substantial scientific uncertainty (McCright and Dunlap 2000). One of the themes documented by McCright and Dunlap (2000) here is that claims of global warming are a scare tactic perpetuated by environmentalists, creating catastrophic scenarios to “arouse support for their cause and justify any action that would maintain the security of their livelihoods” (p. 512). This idea can easily be extended to responses to claims of PVC related risks by those in the anti-PVC movement. The second counter-claim identified by McCright and Dunlap (2000) argues, “that the condition, if it should exist, would not be problematic” (p. 510). The contention of the third counter-claim, “taking any proposed international binding action would have numerous negative consequences” is discussed in the section examining counterframing as ‘economic harm’” (McCright and Dunlap 2000:510)

Together, the counterclaims identified by McCright and Dunlap (2000) function to non-problematize environmental risks and harms. Similar to the first claim, “the problematic condition does not exist” observed by McCright and Dunlap (2000), Schnaiberg (1994) notes, conflict “initially ranges around assertions about problem severity” with environmentalists seeking to raise consciousness as producers engage in consciousness-lowering activity (p. 39). As an example, the Vinyl News Service, an industry sponsored Internet site, extols the virtues of vinyl in six short videos on topics such as recycling vinyl, vinyl’s beneficial uses, and vinyl’s safety. In “The Benefits of Vinyl,” Dr. Patrick Moore (2007), a controversial former Greenpeace member turned vinyl industry consultant repudiates concerns of the anti-PVC movement:

The anti-vinyl activists have made a lot of crazy allegations about the effects of vinyl. For instance, they say that chewable baby toys are going to cause health problems in infants. This has been completely rejected by the European Commission, full studies on vinyl, and even the Green Building Council of the United States, which is an activist-based group in many ways, has rejected the criticism against vinyl.

⁹ Contrasted with frames, claims are more narrow, often examined ahistorically, and seem to overemphasize the agency of individual actors, leading McCright and Dunlap (2000) to use framing processes to overcome these limitations.

In addition to constructing concerns about phthalates and PVC as non-problems, Moore evokes the rhetoric of environmental extremism, implying that other ‘activist’ organizations are not in agreement with calls to eliminate PVC. When in fact, despite Moore’s statement, the USGBC has made no such outright statement, nor has it addressed concerns of PVC use in medicine. Whereas, McCright and Dunlap (2000) found users of this counterclaim rely on scientific uncertainty to argue that the problematic condition does not exist, Moore misrepresents the certainty surrounding PVC studies in order to suggest that it is PVC opponents who are making false claims.

The second counter-claim identified by McCright and Dunlap (2000) argues, “that the condition, if it should exist, would not be problematic” (p. 510). While slightly different than the example provided above on industry proclaimed benefits of chlorine, the premise behind the claim is the same: to up end the arguments of its opponents by depicting the issue as a non-problem. For Schnaiberg (1994), conflicting claims about the problem typically arise from producers as they either deny contributing to the problem or minimize their share of the problem. The vinyl industry refrain, “never been any evidence of harm,” is evoked consistently in vinyl industry arguments as it was throughout my interview with vinyl industry representative Edward Benson,¹⁰ and used almost regardless of whatever is currently being challenged.

With DEHP, movement antagonists generally acknowledge that DEHP exposure occurs, but contend that even at high doses, evidence of harm to humans is insufficient. As Benson stated, “the issue is, is it dangerous?” Moreover, and “equally boldly” according to Schnaiberg (1994), “they may claim that the problem is a generalized outcome of all production, or industrialization itself” (p. 39). In my interview with Benson, I was told, “Everything comes with health and environmental impacts of some kinds.” The message of course being that there is nothing to be done about it.

Scientific Counterframing

Scientific counterframing and scientific arguments are a constant undercurrent of the PVC debates. In large part, the social, political, and economic arguments surrounding PVC stem from a lack of scientific certainty on the environmental and human health risks

¹⁰ Pseudonym.

of PVC. Even where the threats are known and recognized by the scientific community, the degree to which that harm is acceptable is often decided politically rather than scientifically. Scientific strategies are characterized by at least four different, but interconnected themes; intentional misuse of science, presenting science as “good” or “bad,” hiding one’s agenda under the pretense of ‘objective’ science, and using scientific uncertainty to construct an argument of safety. Scientific frames often rely heavily on ‘appeals to authority’ to strengthen the credibility of the counterframe.

Following the IJC recommendation of a chlorine sunset, the industry’s reframing of the *problems* of chlorine to the public health *benefits* of chlorine was furthered by repetition of the ‘chlorine is natural’ message. This tactic of “naturalizing” chlorine was also later used in regards to dioxin. In *Rachel’s Folly: The End of Chlorine*, writing on behalf of the Competitive Enterprise Institute, conservative columnist Michelle Malkin and Michael Fumento (1996), a former Senior Fellow at the conservative think tank, praise the benefits of chlorine and point to its prevalence in nature, “a ubiquitous element, one of the basic building blocks of all matter on the planet,” chlorinated organics are released from “volcanic activity, forest and grass fires, fungi, algae, ferns...” (p. 10).¹¹ The Vinyl Institute uses a similar tactic when they say, “Vinyl is composed of two simple building blocks: chlorine, based on common salt, and ethylene, from crude oil” (www.vinylinfo.org). Such logic relies heavily on public scientific illiteracy and is used to dismiss concerns by defining the issue as a ‘non-problem.’ While it is true that chlorine is found in nature, it makes up less than 0.2 percent of all chemicals in nature. On the other hand, about 77 million pounds of chemicals containing chlorine are now manufactured in the U.S. each year (Fagin et al. 1999). Naturalizing both chlorine and dioxin occurs in the documentary *Blue Vinyl*, in an almost comical manner, when an industry representative is shown comparing vinyl with table salt, implying that vinyl is no more harmful than the sodium chloride content of ocean water. In my interview with the vinyl representative, I was also told of the ubiquity of chlorine and how “anything that

¹¹ *Rachel’s Folly* is written on behalf of the Competitive Enterprise Institute, a conservative public policy advocacy group and proponent of free market environmentalism. CEI believes “current environmental policy is overly federalized” and “CEI has been a leader in the fight against the global warming scare” (www.cei.org).

burns will create dioxin” because “it is found naturally. Chlorine is in everything – plants, water, wood, bodies, oceans, table salt minerals.”

Use of this argument can be traced to 1978, when the Dow Chemical Company released a report called *Trace Chemicals of Fire*. According to Lois Gibbs (1995), Dow introduced “the idea that dioxin is present everywhere and has been around since prehistoric times. Its source, the report claimed, is combustion—any and all forms of burning – and no man-made chemicals need to be present to create dioxin in the environment” (p. 9). Dow appeared to be countering the negative scrutiny directed at the company for exposing U.S. Soldiers in Vietnam to the contaminant Agent Orange and also for fish contamination near a Dow manufacturing facility in Michigan. Following the company’s research near the plant, the Dow scientist in charge reported, “our research proves that dioxins are present not just in Michigan...Because dioxins are ubiquitous, we need not be concerned about them” (Smith 1978: 1167). Dow was forthcoming about how economic interests guided their motives, with a Dow scientist admitting, “We learned so much about dioxins in order to defend our pesticides” (Smith 1978:1167). As summarized in an article in *Science*, “the whole affair is an example of a private corporation going to extreme lengths on a point of scientific curiosity in order to protect itself from regulation” (Smith 1978:1166).

The chemical industry characterization of chlorine as ‘nothing more than table salt’ aims to deflect criticism and provide reassuring ‘neutral’ and ‘objective’ scientific claims regarding health and environmental impacts of their industry. Who can argue against naturally found table salt and the importance of clean and safe water supplies? The attempt to appeal to a sense of morality and to ‘neutral’ values of human health and well-being is hidden within a value-laden agenda, using scientific claims to bolster industry agendas. This is not to imply that PVC opponents do not engage in similar tactics. They do engage in these tactics; however, there are significant power differences between large, often multinational corporations whose interests are implicitly and explicitly protected by the dominant political and socioeconomic systems.

This leads to a second recurrent scientific strategy that emerges from conflict surrounding the IJC declaration. Science becomes framed and politicized in terms of

'good science' and 'bad science' even when it is neither, but a case of manipulating or distorting science for political economic gains. According to Richards (1987) this 'scientism' or "append[ing] the word 'scientific' to one's evidence is to lend one's argument weight of a special kind; to associate it with some action is to suggest a specially notable reputability" (p. 137). It should be noted that the scientific debates surrounding PVC are less concerned with the philosophical underpinnings of scientific research and development than with the interpretation and application of that scientific knowledge to PVC related policy and use.

Scientific framing and arguments are used throughout the PVC debates. Appealing to scientific 'truths' or 'experts' is intended to sway public opinion and at times serve as a call to action. For PVC opponents, concerns are more likely to be acknowledged as scientifically uncertain but framed prognostically as requiring a precautionary approach. More complicated and contentious scientific controversies occur when policy decisions (e.g., EPA or USGBC) are involved. Stakeholders focus their attention on different facts as well as interpret the same facts in different ways (Schön and Rein 1994). Scientific arguments rely on "idealized scientific images as a source of authority" (Richards 1987: 137) to support a political or economic agenda as if there is an 'objective truth' that *our side* is making but the *other side* is not. In their work on policy controversies and frame construction, Schön and Rein (1994) argue that framing is normatively driven. In much of the PVC debates, stakeholders are upfront about their values, yet at the same time present their scientific data as if it is value-free.

One key politicization tactic of movement stakeholders involves reliance on 'experts' or expert knowledge to dismiss the claims of opponents. In the VI and CCC advertising campaign, images of medical professionals were used to convey a sense of authority to substantiate the VI and CCC's claim of vinyl safety and appeal. As previously discussed, professionally, physicians are granted authority and serve to legitimate the frames of social movement actors. Because of the power that accompanies authority, social movement actors seek to apply authoritative status to non-professionals or other entities in order to draw on and convey a sense of legitimacy to their position, while their opponents work to undermine these efforts. Part of this entails using experts

who are not either directly associated with or easily identified as being part of one's organization; legitimacy is then granted by an outside authority.

In 1999, former U.S. Surgeon General C. Everett Koop served in this role for the vinyl and chemical industries. As one of the more recognizable Surgeon Generals and ranking as the nation's "most trusted health authority" in opinion polls (Noble 1999), Koop's engagement in the phthalate safety debate functioned to increase the legitimacy and resonance of the industry's 'non-problem' and 'scientific uncertainty' counterframes. *Plastics News* editorialized, "In this celebrity-crazed era, a stamp of approval from Koop seems to be just the prescription that the vinyl industry needed" (Noble 1999:6). As mentioned, Koop led an American Council on Science and Health (ACSH) scientific panel, which reviewed the safety of phthalate plasticizers and concluded there was no scientific evidence that they are harmful to either adults or children. Koop wholeheartedly defended DEHP, calling activists' concerns "the latest phony chemical scare that have been peddled to the American public in recent years" (Koop 1999:6). However, within months after the report's release, Koop drew criticism when it was revealed that he and ACSH had formed a partnership earlier in the year. In a dismissal of the accusations lodged at the council for its industry bias, Koop responded, it "takes positions based on science, not political correctness" (Koop 1999:6). His credibility was further questioned when ethics charges were lodged at him for not disclosing business ties that blurred the line between advertising and objective medical information on DrKoop.com, his popular health information Web site.

While ultimately the criticisms directed at Koop may have affected public perception regarding the ACSH phthalate review, given that possible ethical abuses did not surface until after the release of the ACSH report, the intent of industry to use Koop's reputation to lend legitimacy to their position was not altered. Thus, rather than employing an argument of 'economic harm' or another counterframe to challenge the movement's prognosis to eliminate DEHP in medical devices and toys, Koop and the ACSH report allowed industry to use scientific arguments to point to the safety of their chemicals and products. Nonetheless, the politicization of PVC and DEHP had begun to affect the behavior of different companies as they sought to distance themselves from

possible environmental and health problems associated with certain products. Initially, the November 1998 ACSH announcement to form a scientific review committee had resulted in some companies distancing from the plastics and chemical industries. Within hours following the announcement, Toys R Us publicized plans to remove some chewable phthalate containing toys from its almost 1,500 stores. Chemical industry officials chose not criticize the company; however, contending Toys R Us was only responding to market pressures generated by Greenpeace and other organizations (Toloken 1998). They may have been right. The Toys R Us decision came just hours before ABC News aired a 20/20 program questioning the safety of phthalate containing toys (Lauzon 1998).

Economic concerns are often concealed behind scientific counterframing. For example, some stakeholders strongly contested the decision to list DEHP as reproductive toxic under Proposition 65. Opponents submitting comments to California's Office of Environmental Health Hazard Assessment (OEHHA) included DEHP manufacturers (Aristech Chemical Corporation and Eastman Chemical Company), Baxter Healthcare, and several trade associations (the American Chemistry Council Phthalate Esters Panel, AdvaMed (Advanced Medial Technology Association)). Among their complaints, industry representatives rejected NIOSH's qualifications as an authoritative body capable of identifying DEHP as a reproductive toxicant, disputed the applicability of rodent studies for demonstrating reproductive toxicity in humans, and argued that there is no evidence DEHP is a human reproductive toxicant.

The comments of stakeholders and responses to the OEHHA typify the politicization of science, where scientific uncertainty is over-emphasized to delay policy or regulatory decisions with potential economic impacts. Corroborating the counterclaims identified by McCright and Dunlap (2000) above, opponents of listing DEHP in Proposition 65 argued strongly against acting on insufficient data, reasoning, "exposure does not equal risk," and urged inclusion of several studies countering OEHHA's conclusions (Cammack and Liebler 2003). However, these unconsidered studies were primarily industry sponsored and not all were published or peer reviewed. AdvaMed, the medical technology trade association, requested to be included in related

OEHHA discussions and data review. Emphasizing the economic strength of their members (almost \$64 billion in sales in the U.S. and almost \$84 billion globally) AdvaMed's argument that "DEHP Prop 65 listing would unfairly target medical products for labeling" (Cammack and Liebler 2003) reflects the oft argued industry counterclaim regarding the "numerous negative consequences" that arise from regulation. As Schnaiberg (1994) argues, capitalist producers strongly resist "a genuinely balanced 'scientific' treatment of environmental (and social) costs and economic benefits..." (p. 125).

Schnaiberg's argument is reflected in the contrasting responses of two different medical supply companies to Proposition 65. B. Braun, a PVC/DEHP free IV bag producer, supported the OEHHA's conclusion to list DEHP, whereas Baxter, who had yet to produce a PVC/DEHP free IV bag, strongly disagreed and used legal tactics to challenge the listing. Baxter submitted comments by well-credentialed pediatricians with expertise in reproductive defects, developmental toxicity, reproductive endocrinology, infertility, medical genetics, pharmacology, and toxicity (Nye, Marcus, MacKinnon 1999). They retained the services of pro-industry lawyers who sought to protect Baxter's economic interests through a scientific defense, stating, "Most decisions about legal strategy are, in the end, economic decisions....Under California law, the best defense really may be a vigorous scientific defense" (Adams et al. 2006:8).

Public health protection clearly is not a scientific process, but indeed is a political, economic, and, in some cases, also a legal process. Efforts by anti-PVC activists to frame DEHP listing as a public health concern is almost irrelevant insofar as such arguments are only addressed by producers in relation to the protection of their economic interests. The proposal to list DEHP as causing human reproductive toxicity was especially significant because it followed on the heels of DEHP having recently been removed from Prop 65 as a carcinogen. In 1988, DEHP was added to Prop 65 on the basis of positive carcinogenicity in rats and mice. Baxter challenged this listing in *Baxter v. Denton*, spending an estimated \$6 million arguing that rats and mice metabolize DEHP differently than humans (Bell 2002). In a landmark ruling, the judge granted a statutory exemption for lack of a preponderance of evidence, finding that the chemical poses "no

significant risk of cancer” to humans. Judge Talmadge R. Jones backed the ruling by stating that a preponderance of evidence “is appropriate because it balances the interests of users and manufacturers of chemicals with the interests of persons potentially exposed to the chemicals” (Totten 2002). In an effort to be ‘balanced,’ this ruling in effect legitimated the prioritization of economic interests over public health interests and confirmed the state’s position as a protector of economic interests.

Counterframe: Marginalization

If stakeholders remain unable to convince the pertinent parties of the legitimacy of their arguments, or, if they are seeking to bolster their position, their next step is often to ‘attack the messenger.’ Attacks may be directed at individuals or organizations. The accuracy of the assaults is secondary to the goal of discrediting movement protagonists. The voraciousness of the attacks is likely a reflection of the success of the movement and its arguments. According to Joe Thornton, following the publication of *Pandora’s Poison* (2000), an online essay was posted on an industry trade association sponsored website calling him “a Stalinist” and stating that “it’s people like me who are responsible for millions of deaths in the Soviet Union.” In my interview with Benson, individual activists were referred to by name and belittled or maligned. Benson made remarks such as, “Lois Gibbs has been obsessed with dioxin ever since Love Canal.” Such comments are purposively dismissive and trivializing both of Gibbs and her claims of human and environmental harm.

Following the IJC Declaration, the tactic of ‘attacking the messenger’ was employed by industry as a way to attribute blame and denigrate the opposition as the campaign against chlorine mounted. In this case, industry’s attention was directed at Greenpeace. Greenpeace was portrayed by industry as a bully and pressuring media outlets. The American Public Health Association was also chastised for publicly taking a position. Such a tactic renders agency only to the most controversial of the opponents, those against whom the industry perceives little will be lost if they engage in adversarial tactics. Identifying just a single opponent is intended to minimize the power of the movement. More organizations involved in the movement complicate countermobilization; it is easier to marginalize the criticism of PVC by attributing it to a

single ‘radical’ or ‘fringe’ environmental group with “anecdotal, emotive, and propagandistic approaches” (Goodman 1994: 158).¹²

In response to the CPSC decision regarding toys, the Vinyl Institute condemned Greenpeace’s act as “poisoning the minds of American parents” while the Toy Manufacturers of America accused the organization of spreading “scientific half-truths” (Lauzon 1998). By doing so, these trade associations focused their rebuttal on their opponents’ proposed remedies rather than addressing the potential for phthalate laden PVC toys to harm children. In this case, the plastics and toy industries did not argue against safe toys, instead, they engaged in the *counterrhetoric of insincerity* (Ibarra and Kitsuse 1993), an unsympathetic counterrhetorical strategy used to suggest their opponents are acting because of a “hidden agenda.” Industry arguments often take the form of *ad hominem* attacks. Industry argues that Greenpeace and other movement actors politicize PVC for their own self-interested reasons and therefore their arguments should be dismissed. Attention is thus deflected away from issue and onto activists. The plastics and chemical industry may be critical of state regulations or company phase-outs, but they are more likely to direct their efforts towards attacking specific activist organizations or promoting their industry rather than confronting those in positions to make policy and economic decisions.

Greenpeace’s collaboration with Health Care Without Harm complicated the marginalization of the environmental organization. As reported in *Chemical Week*, “industry sources say that while Greenpeace succeeded in persuading many manufacturers to eliminate phthalate-softened PVC from some toys, it will have a harder time with medical products” (Sissell 1999b:17). The chlorine and plastics industry may have failed to account for a shift in tactics among PVC activists and public health advocates. Industry’s portraits of Greenpeace as a radical, fringe environmental group could not stick to HCWH. Use of the counterrhetoric, an unsympathetic counterrhetorical strategy, whose “...usage implies that the moral judgment of the

¹² This is certainly not a new tactic of the chemical industry; for instance in the early 1980s Herbert Needleman was vilified for his research on the impact of lead on children’s health. Before that, industry denigrated Rachel Carson and her work on her synthetic pesticides; both of which continued to be vilified today (see Weir 2007).

claimants is not based in a 'sound' assessment of the condition but is under the influence of 'irrational' or 'emotional' factors" could no longer be applied (Ibarra and Kitsuse 1993:42). Through working within the system and recruiting nurses and physicians by morally appealing to a philosophy of 'do no harm,' public health and environmental health advocacy groups have been quite successful to the point where by and large, phasing-out PVC, or at least DEHP, has become mainstream, or at least uncontroversial. And, in comparison to Greenpeace's toy campaign, the medical device campaign is directed more at *users* rather than producers, who have no economic relationship to the viability of the product.

As a strategy to minimize the influence of SMOs and actors, attacking the messenger can manifest in various and direct forms. For example, the protest by CHEJ activists at the EPA's Science Advisory Board (SAB) dioxin review subcommittee meeting regarding industry influence, led to attempts to constrain the demonstrators. CHEJ describes their tactics:

a silent protest [was held] in the hall outside the meeting room. Inside, as each member was asked to disclose conflicts of interest, community leaders held up lap-signs that listed the corporations with an interest in dioxin that the committee member had received funding from. These community leaders later presented testimony on the need to finish the dioxin reassessment and release the report (CHEJ 2001).

In a defensive move, rather than address the merits of CHEJ's charges, industry sought to use a variation of 'attacking the messenger,' to silence CHEJ. Industry claimed the committee experienced intimidation from thirty-five protestors who attended the dioxin review committee meeting. The executive director of the CCC, Kip Howlett, proposed the formation of a new SAB with an extended timeline. The EPA rejected the CCC's demands for the convening of a new subcommittee, leading Howlett to then advocate new policies limiting public participation and using uniformed officers to enforce them.

An examination of the attacks on Gerald Markowitz and David Rosner's credibility serves to demonstrate how multiple counter tactics and arguments converge in an effort to negate the impact of opponents. Discrediting 'the messenger' or opponents is intended to legitimize one's own position. Challenging the reputability of opponents with considerable status or levels of prestige is risky and may backfire. It may serve to mobilize otherwise disengaged, but sympathetic potential constituents, expanding the

ranks of the movement. However, on the other-hand, this tactic may be effective and undermine opponents' frames. If disputes are about credibility contests rather than framing contests, the movement is at least partially or temporarily detracted from environmental and health problems. As stated in chapter two, the chemical industry did not react favorably to Markowitz and Rosner's (2002) account of the vinyl industry's history in *Deceit and Denial* and employed several tactics intended to discredit the two historians. The more controversial and unprecedented tactic involved an outright attack on both Rosner's and Markowitz's ethical conduct including an assault on the review and publication process of the book. Markowitz and Rosner had been enlisted as expert witnesses in lawsuits filed on behalf of former VCM workers to provide an historical record for the corporate deception regarding links between VCM and cancer. In response, twenty chemical companies (including Dow, Shell, Monsanto, Goodrich, Goodyear, and Union Carbide) joined together to discredit the authors, primarily because of their status as expert witnesses in these lawsuits.

The attacks on Markowitz and Rosner stemmed from chemical industry economic concerns. As Shriver, White and Kebede (1998) maintain, the construction of environmental illness is marked by "intense competition for credibility between claimsmakers" (p. 461). While Shriver et al. were referring specifically to multiple chemical sensitivities, their overall contention is that those proposing environmental illness frames must confront a dominant frame protective of the political and economic interests of the industrial and polluting sector. In this case, the companies recruited their own historian to cast Rosner and Markowitz as unethical and substandard researchers. Philip Scranton of Rutgers University was specifically asked to review and evaluate two chapters in *Deceit and Denial* as well as a report written by Markowitz as a key witness in *Douglas M. Spann, et al. v. Airco Inc, et al.* A chemical worker who claimed that Airco and other chemical companies were liable for his liver cancer because of on the job vinyl chloride monomer exposure filed this lawsuit. More specifically, Scranton was asked to evaluate whether Markowitz's work violated professional standards for responsible historical scholarship (Scranton 2004). Scranton charged that Markowitz violated "basic principles of academic integrity, historical accuracy, and professional

responsibility” and engaged in “sustained and repeated violations” of the official “Standards” of the American Historical Association (Wiener 2005:20). Markowitz was accused in part, of a pattern of ignoring evidence, failing to understand the complexity of science, knowing (at least by name) and recommending several manuscript reviewers. Scranton determines these latter two points indicate the review of *Deceit and Denial* was “largely done ‘among friends’” (Scranton 2004:40). However, as an academic Scranton should be aware that at times authors do suggest scholars whom they know are knowledgeable about particular subjects.

Industry’s use of Scranton was an attempt to strengthen the credibility of their own framing by denigrating Markowitz and Rosner with another ‘expert.’ Indeed, Scranton’s credentials are impressive. He is a University Board of Governors Professor of the History of Industry and Technology. However, he is not, nor does he claim to be, an expert of the postwar chemical industry (Wiener 2005). By using a fellow historian, the chemical industry was likely seeking to create division within the discipline. Markowitz and Rosner accuse Scranton of misleading “his reader by raising red herrings, distracting the reader from industry’s failure to inform government of troubling data” (20).¹³ This was accomplished not just by what Scranton wrote in the report, but the fact that the report was written at all.

Scientific arguments are embedded in these claims of ethical violations, with Scranton’s suggestion that a researcher is unable to be both an advocate and simultaneously produce legitimate, quality research.¹⁴ Neither Markowitz nor Rosner was investigated for unethical research or violating American Historical Association standards. In an interview for a *Nation* article on this topic, then AHA Vice President for Research, Roy Rosenzweig, commented, “In my opinion, the book represents the highest standards of the history profession. Scranton should be embarrassed to make the claim that there’s an ethical violation here—as opposed to the claim that he disagrees with their

¹³ There is no year cited, but Markowitz and Rosner’s response most likely followed Scranton’s critique in 2004.

¹⁴ On the flipside, Barrow and Conrad (2005) argue that the public sector should feel assured that the research produced or funded by the chemical industry is free of bias and the credibility of its scientists should be viewed similarly.

interpretation” (Wiener 2004:21). As Markowitz and Rosner point out, their work received positive reviews from the public and more than double the standard number of outside reviewers were used by their publisher, a fact not mentioned by Scranton.

Markowitz and Rosner’s response to Scranton was simultaneously an attempt to prove the quality of their research, defend their reputations, and speak-up against such tactics of intimidation. Markowitz and Rosner (N.d.) assert that “Scranton is guilty of every ‘violation’ and sin of historical scholarship he accuses [them] of” (p. 8). Nonetheless, industry was able to subpoena and depose five (of eight) academic reviewers of *Deceit and Denial* and all the records of the press and the foundation that published the book “concerning their work, their relationship to each other, and the peer review process” (Markowitz and Rosner N.d.:2). The politicization of their integrity and the veracity of *Deceit and Denial* was a way to cast doubt onto Markowitz and Rosner rather than have focus remain on the chemical industry and what it knew and when.

Counterframe: Economic Harm

The final counterframe, economic harm, is the third counter-claim identified by McCright and Dunlap (2002). Economic harm counter-claimants maintain “taking any proposed international binding action would have numerous negative consequences” (p. 510). Any regulations affecting PVC manufacture or use are generally state or national; however, inherent in this counter-claim is the contention that any regulation will harm the national economy. This last claim supports Hirschman’s (1991) argument that when countermovements call for inaction, they “invoke a rhetoric of reaction stressing jeopardy, the risk of losing achievements that we have already gained” (cited in McCright and Dunlap p. 516). As Benson reiterated throughout our interview, “bringing down PVC symbolizes bringing down chemical industry.” In their critical response to the Greenpeace and IJC recommendation to phase-out chlorine chemistry, the Chlorine Chemistry Council (CCC) and the Chlorine Institute (CI) called attention to the huge economic costs of eliminating chlorine chemistry, a strategy intended to emphasize what they consider meager social or environmental returns on such an action. To support its position, the CCC and the CI commissioned a number of reports challenging the proposal, including a 4000-page report on the health and environmental effects of

organochlorines (Cap 1996). These counterrhetorical strategies (see Ibarra and Kitsuse 1993) attempt to block opponents' characterizations of PVC environmental and health problems and thus influence the tactics of politicization used by PVC opponents.

One of the more paradoxical tactics used by PVC supporters involves strategies to evoke sympathy or portray industry as 'victims.' In a curious application of Ibarra and Kitsuse's (1993) concept of *expansion* where "claimants seek to expand the distribution or scope of a good, service, or right industry aims to extend the notion of *fair play* and *justice* to the trampled on rights of companies and/or corporations" [emphasis in original] (p. 34). In a Proposition 65 White Paper, Adams, Nye, Sinunu, Bruni, Becht LLP, Attorneys at Law, one of the law firms representing Baxter, warns companies of private 'bounty hunters' who sue, not because of public health concerns, but for financial gain. As Adams et al. (2006) see it, "The law requires meaningless warning of chemical exposures which often pose no real risk, while simultaneously operating a system for relieving defendants – particularly out-of-state companies – of large amounts of money" (p. 1). The white paper is largely directed at 'unsuspecting' out-of-state companies who have become 'cornered' by Proposition 65 bounty hunters and seemingly left with few options given 'manipulation' of Proposition 65 to turn out-of-state defendants into capitulators.¹⁵ The phrase "Bounty hunter" caught on with others in the industry. For example, in our interview, Benson, who views Proposition 65 as 'overkill,' also used the term "bounty hunter".

Conclusion

In the early 1970s PVC was politicized predominately as an outgrowth of concerns held by production workers and fire fighters. By the early 1990s, concerns shifted from framing PVC concerns around worker and even public health safety, to broader framing around chlorine chemistry, which focused not only on human health but environmental health as well. We then saw PVC specifically, move back into focus as the primary issue around which environmental justice activists and advocacy organizations began to mobilize. In the mid to late 1990s, concerns were framed around

¹⁵ Adams et al. (2006) adapt the term 'capitulation' as it is used in equities investing, to refer "to sellers who are convinced they should get out of a market as fast as possible, and without much regard for price, because disaster is looming" (p. 8).

environmental and human health, but the movement had moved away from the larger vision of a chlorine-sunset to focus on PVC and even health care environmental impacts more broadly. This clarification and the strengthening of frames serves to accentuate and highlight some issues and beliefs as being more salient than others (Benford and Snow 2000). This process of ‘frame amplification’ also reflects elasticity and inclusivity in collection action framing. As stated, HCWH formed primarily in response to the EPA’s Draft Reassessment on Dioxin documenting the role of medical waste incineration, and specifically the impact of vinyl as a chlorinated plastic in dioxin production, but knowledge of health care’s environmental impact led them to investigate other environmental problems such as mercury and waste reduction more generally.

Alongside Greenpeace’s message, PVC concerns began to be framed as part of an emerging movement to green the health care industry. As medical incineration declined, concerns regarding DEHP in medical devices emerged as a larger concern. More recently, concern has extended to PVC in hospital construction and building materials. CHEJ has remained committed to addressing dioxin concerns, first, through its Stop Dioxin Exposure Campaign, and more recently through its BE SAFE campaigns. HCWH and others have not abandoned Greenpeace’s prognoses, but broadened the scope of the movement’s strategies and targets.

By doing so, the anti-PVC movement began to show signs of becoming a burgeoning Public Interest Health Movement (as discussed in the previous chapter). Greater numbers of health care professionals joined the movement and the health care arm of the movement became a bit more institutionalized as HCWH began meeting with hospitals and health care providers and suppliers, viewing them as potential movement adherents rather than antagonists. Direct action continued through Greenpeace and others, including HCWH and CHEJ, joining with and supporting community environmental justice groups protesting incinerators and the impact of production facilities. Greenpeace has not disappeared from the anti-PVC movement. However, similar to the initial chlorine chemistry campaign, the organization has embedded its PVC concerns within a broader framework. This time, the toxics campaign is primarily targeting electronic companies, demanding that manufacturers design clean electronics

with longer life spans, that are safe and easy to recycle, and will not expose workers and the environment to hazardous chemicals (www.greenpeace.usa). Their approach is to pressure or ‘encourage’ electronic companies to clean up their product and part of this entails committing to a PVC phase-out.

In this chapter, I focused on the formation of the anti-PVC movement, introduced and examined some of the themes that emerge as constants throughout the movement, specifically framing concerns and countermobilization tactics. I argued that scientific arguments are threaded throughout the movement and used by stakeholders to validate their claims and discredit their opponents. The countermobilization tactics of industry included scientific framing to support their position and to convince others of the safety of PVC. This is accomplished in part through repetition of their message, even if scientifically inaccurate, the use of ‘experts,’ and the framing of science in terms of ‘good’ and ‘bad’ science. I presented evidence of industry attempts to influence policies and decision-making bodies and advisory boards, often using tactics their opponents found deceitful and demonstrative of conflicting interests. Other tactics were defensive in nature and included attacking the messenger and attempts to silence activists. Industry engaged in a pattern of counterclaims used by protagonists in other environmental movements as well as unsympathetic counterrhetorical strategies.

At the outset of the anti-PVC movement, framing and strategies were primarily set by Greenpeace’s chlorine chemistry campaign. The movement was later marked by the passage of resolutions as a number of medical associations, societies, religious organizations, and city councils formally took a position on PVC and dioxin concerns. Since the movement’s inception, PVC has been broadly framed as an environmental and human health problem; however, the framing has evolved along with the movement’s trajectory. The more confrontational tactics and direct actions of activist organizations such as Greenpeace and CHEJ began to be superseded by the tactics characteristic of today’s movement. In the next chapter, I turn to a discussion of the third wave of the anti-PVC movement through an in-depth examination of the concerns, tactics, successes, and barriers to phasing out and eliminating PVC in the health care industry.

CHAPTER V

FIRST, DO NO HARM? PVC IN HEALTH CARE

In the 1960's and again in the 1980's, medical needles, syringes, and empty prescription bottles began washing up on beaches in the eastern U.S. Other medical waste accidents were also widely reported in the media, turning public attention to the environmentally harmful aspects of the health care industry (Pierce and Jameton 2004). In response, Congress enacted the defunct Medical Waste Tracking Act (Mwta) of 1988 with four broad objectives: to define medical waste and those wastes to be regulated; establish a cradle to grave tracking system; require management standards for segregation, packaging, labeling and marking, and storage of the waste; and establish record keeping requirements and penalties that could be imposed for mismanagement (www.epa.gov). At this time, health care institutions began responding to public, regulatory, and economic pressures by reviewing their waste streams; however, these well-intentioned actions have not been nearly enough. Hospitals continue to generate more than 6,600 tons of waste per day or over 2 million tons of waste each year (Ferri 2007).

The environmental impact of industrialized health care is immeasurable and “significantly damages the environment—by the overall material scale of its activities and by the variety, toxicity, and volume of its waste stream” (Pierce and Jameton 2004: 43-46). PVC represents just one piece of this impact, but with far reaching ecological and health ramifications.¹ Hospitals and other medical centers are places of birth, diagnosis, treatment, and recovery. They are generally not presumed to be the source of health problems, yet, in the case of PVC, not only may health risks arise for some patients from the use of PVC medical devices such as IV bags and tubing, but the continued use of PVC by the healthcare industry either in medical devices or building

¹ As discussed in chapter one, among the problematic factors relating to the PVC lifecycle include; living and working conditions, surface and groundwater pollution, air pollution from fires, incineration, chemical and petroleum spills, and synthetic chemicals exposure (Brown 2000; Buchanan 1995).

materials contributes to some of the health and environmental problems associated with the PVC lifecycle. As indicated, PVC plastic is the most widely used plastic in medical devices. It is found in a wide range of health care products, including bedding covers, intravenous tubing, blood bags, catheters, gloves, and respiratory therapy products. PVC is also found in hospital flooring, pipes, carpet backing, wall coverings, plastic food wrap, office furniture and supplies. Additionally, new construction of medical facilities is rising along with the expansion of existing facilities, doubling in the years 2000 to 2005 (Feldstein 2007). Considering these factors in tandem, and the health and environmental impacts of the PVC used by the medical industry becomes much more than significant.

“Because of the lifecycle issues from the beginning of its [vinyl’s] manufacturing to the end. It just isn’t acceptable.”

Marian Condon, Registered Nurse

Activists and participants in the anti-PVC movement frame PVC concerns as an environmental and human health problem. Having diagnostically framed PVC as a lifecycle threat, at different times the movement has focused on different aspects of those harms. In part, this varies by whether one is active in the anti-PVC movement as it manifests within the health care or the green building industries. Chapter four examined the earliest debates of the anti-PVC movement and introduced some of the under currents that run throughout the movement, in terms of tactics, arguments, counterframes, and strategies. Compared with the third wave of the anti-PVC movement, wave two involved more contentious direct action, use of different collective action frames, a greater emphasis on environmental justice and worker concerns, and was more directed at efforts towards increasing public awareness. While there was some cooperation between activists and established organizations working within system (for example, IJC and Greenpeace), the movement was not marked by ‘professionals’ as it largely is today. Partly for this reason, current participants have greater economic and social stability or ‘staying power’ in that they are not as susceptible to fluctuations in movement numbers or funding. The changes in movement members and strategies have not gone unnoticed

by the vinyl industry. My industry contact says when he first started his job in 2000, Greenpeace engaged in direct action; now organizations are more sophisticated. To paraphrase his example, they use footnotes in their reports to look 'legit' and use nurses, doctors, and Ph.D.'s to write reports. The countermobilization efforts have evolved as well and are examined throughout this chapter.

This chapter describes and analyzes the anti-PVC movement as it has emerged within the health care industry.² The anti-PVC activists and members of the movement seeking to limit or eliminate PVC use include: individual nurses, nursing associations and unions, environmental health organizations, and some healthcare facilities and medical products manufacturers. Specifically, the predominant SMOs and other organizations referenced throughout this chapter include: Health Care Without (HCWH), Catholic Healthcare West (CHW), Hospitals for a Healthy Environment (H2E), the American Nurses Association (ANA), United American Nurses (UAN), the Oregon Center for Environmental Health (OCEH), and Kaiser Permanente (KP).³ I discuss the movement as an example of a Public Interest Health Movement (PIHM) as described in chapter two. The PIHM is a HSM ideal type with four primary characteristics that distinguish it from other HSMs: 1) the relation to the problem, 2) the power to address the problem, 3) activists work within the system, and 4) activists address type three contested illnesses with diffuse or hard to establish causes. I examine the major debates surrounding PVC in medicine, focusing on the concerns and objectives of those involved and the tactics and strategies they use to direct the industry towards a healthcare without harm. The politicization of PVC largely centers on four major points of contention: DEHP, dioxin, recycling, and landfills. While not all movement protagonists frame PVC concerns identically, of these, DEHP is the most disputed within the health care industry, and for that reason DEHP receives substantially more consideration in this chapter.

² Throughout this chapter, any references to 'the movement' specifically refer to the anti-PVC movement within the health care industry.

³ To minimize some of the confusion that often accompanies heavy acronym use, I try to reintroduce the reader to the full name intermittently throughout. Please also see Appendix E for a complete list of acronyms.

Relation to the Problem

A movement adherent's 'relation to the problem' reflects their relationship to the means of production and their position in the class structure. Health care movement protagonists are comprised of a range of professionals, SMOs, labor unions, and health care organizations, but workers in the plastics or chemical industries are not represented. Since movement participants are not materially dependent on PVC production, they are freer to politicize PVC than production workers. As discussed in chapter three, for several reasons health care movement participants or activists are more likely to emphasize the harms associated with the use stage of the PVC lifecycle. Most significantly, this is the stage in the PVC lifecycle that is most familiar to them and potential constituents. The articulation of PVC hazards as primarily a problem of medical use is more likely to resonate with professionals within the field if the problem is diagnosed as a patient health concern. It follows that relation to the problem greatly influences the framing process. In general, PVC concerns are framed in terms of consumption, rather than in terms of occupational health and safety. The prognostic framing of movement adherents within the health care industry is focused on changing consumption patterns.

Framing of Concerns

Greenpeace's organochlorine campaign in the early 1990s began what has now transitioned into the third wave of the anti-PVC movement. In 1996, HCWH, now a leading organization in the anti-PVC movement, was founded largely around issues relating to dioxin formation as a result of the incineration of PVC in medical waste. At this time, environmental activists, nurses, physicians, and public health advocates joined with 28 organizations, including the Center for Health, Environment, and Justice and Physicians for Social Responsibility, in Bolinas, California to discuss a response to the 1994 U.S. Environmental Protection Agency Draft Dioxin Reassessment. As of 2006, there were less than 100 medical waste incinerators in the U.S., a drop from over 5,000 in 1996. This decline is largely attributable to the work of HCWH, Greenpeace, and their allies. It should be noted that rather than exporting U.S. medical waste to other countries for incineration, alternative modes of disposal (autoclaving, microwaving, chemical

treatment) have been utilized. As medical waste incineration has declined, DEHP in medical devices has emerged as a greater concern. Some movement protagonists have also extended their concerns to PVC in construction and building materials in health care. Movement adherents in the green building industry more proactively address landfill and recycling problems, two of the other major points of contention. With a constant eye on the larger overall lifecycle concerns, anti-PVC movement activists employ different frames to pursue their goals as responses to significant socio-political events, emergent research, or changes within the movement. Marian Condon, a Registered Nurse and occupational and environmental health specialist with the American Nurses Association's Center for Occupational and Environmental Health, remembers, "[goals] were more specific in the beginning. HCWH was specifically about incineration, getting rid of incinerators. And mercury's a big thing so it got included and the PVC issue was part of the mix. And now...there's been a path kind of, and now chemical policy is the overreaching umbrella."

All core health care and environmental health organizations emphasize lifecycle problems (although most commonly dioxin and DEHP), as did the interviewees representing the semi-periphery. For some nurses, medical suppliers, and others in the movement, PVC concerns are secondary to DEHP concerns. Two B. Braun interviewees emphasized DEHP as the greater risk, although one B. Braun interviewee suggested neither PVC nor DEHP are "blatant harms." Nurses were most likely to mention worker health as a concern, although this concern was expressed primarily in relation to nurses' health, rather than production workers. Predictably, the International Association of Fire Fighters interviewees stressed protection and providing support for fire fighters, although somewhat surprising to me, most other interviewees did not make a point to mention fire fighter health concerns specifically. Some movement protagonists embedded PVC concerns within a language of prevention or precaution.

Frame: Children's Health

PVC opponents have expanded on the environmental and human health frame to emphasize 'children's health.' Through a strategic process of frame amplification, activists seek to invigorate the existing values and beliefs of protagonists (Benford and

Snow 2000). How a frame becomes 'amplified' (Benson and Snow 2000) depends significantly upon one's occupation or profession. Paulsen and Glumm (1995) contend that frame amplification is particularly necessary for social movements reliant on conscience constituents who are notably different than the movement beneficiaries. Newborn males, particularly those receiving intensive medical treatment in a NICU, are most at risk for negative health effects of DEHP exposure from hospital devices. Concerns for patient health, particularly infant males, have resonated with members of the health care community. As part of the framing process activists continue to diagnose the problem as lifecycle threats; however, in their calls to action, DEHP elimination is sometimes used as a greater motivator than PVC alone.

DEHP debates are amongst the most contentious and have emerged at the forefront of the movement. This is reflective of larger scientific and political debates that have surrounded phthalates for almost ten years. PVC is ubiquitous in the health care setting although most efforts at phasing out PVC in hospitals have been directed at PVC/DEHP IV bags and plastic tubing. Other commonly used applications of PVC/DEHP include: enteral feeding devices, tubing, endotracheal tubes, oxygen tents, mattress covers, hemodialysis equipment, respiratory therapy products, catheters, thermal blankets, medical gloves, packaging, basins, patient identification bracelets, bedpans, and lab equipment. DEHP leaching rates have been most extensively studied for its effects on banked blood and plasma (Green et al. 2005). The push by some social movement participants, Kaiser in particular, to demand alternatives for these products represents an expansion in their prognostic framing.

It should be noted that the demand for DEHP and PVC free alternatives do not all stem from the lifecycle concerns expressed by the movement. PVC is avoided for use in conjunction with some intravenous medications because they require storage in freezing conditions and PVC cannot be frozen because it will crack. Prior to awareness of DEHP leaching from PVC, PVC/DEHP IV bags were already known to be incompatible with certain pharmaceuticals and known to be problematic in certain applications. Some drugs, especially those with fatty components, accelerate the DEHP leaching process. The two primary areas that use PVC/DEHP free bags are oncology and the NICU. In

oncology, drug interactions are known to occur with Taxol, which is used to treat AIDS-related Kaposi's sarcoma and ovarian and breast cancer, and Taxotere, which is used to treat breast cancer. There is a morbid irony in that in breast cancer medications have been shown to increase the leaching DEHP from IV bags and phthalates are also a suspected cause of breast cancer.

Movement adherents recognize the strength of appealing to concerns for children's health. By emphasizing 'children's health' concerns, PVC opponents constrict the chemical and plastics industries countermobilization efforts. Krimsky (2000) observes, "Perceived risks to young children—as evidenced by the Tylenol, Alar, and automobile airbag cases in recent years—generally foster strong and sympathetic public responses" (58). Greenpeace deliberately targeted toys in their PVC campaign because as then legislative director Rick Hind acknowledged, "the risk involves children and can easily be avoided" (Foster and Fairley 1999:54). In our interview, Stacy Malkan, Communications Director of Health Care Without Harm, expressed concern regarding the adverse effects of additives in vinyl products on children. Referring to a 2005 controversy over vinyl lunchboxes leaching lead, Malkan said, "So, here you've got kids with lunchboxes taking their little organic apples to school, you know, in a lunchbox that's leaching lead – it's just not necessary to have these kinds of toxic materials." Framing the issue as a children's health issue effectively links environmental health with 'family values' potentially creating universal appeal and tactically minimizing controversy. As Sister Mary Ellen, Ecology Program Coordinator at Catholic Healthcare West explains, "You know, I think underneath everything, people want to do what's right for their family, for who they are for survival – when you get down to the base, it's food, water, family, love." Sister Mary Ellen's comments highlight the universality of the movement's claims.

Sandra Steingraber (2000), author of *Living Downstream*, has stated that when it comes to the PVC lifecycle, "the breasts of breast-feeding mothers are the tailpipe" (p. 8). In an essay Steingraber (2000) wrote as a new mother, she connects the relationship of PVC to her infant's health:

This milk, my milk, contains dioxins from old vinyl siding, discarded window blinds, junked toys, and used I.V. bags. Plastic parts of buildings that were burned down

accidentally are also housed in my breasts. These are indisputable facts. They are facts that we scientists are not arguing about. What we do spend a lot of time debating is what exactly are the health effects on the generation of children that my daughter belongs to (P. 8).

Steingraber's personalization of the health effects from PVC is actually a relatively uncommon tactic within the movement. While children's health concerns have substantial importance for the movement, movement adherents are in some ways limited in their ability to mobilize around them. There is no constituency of harmed PVC patients to mobilize and to use in order to others to draw into the movement. There is no 'face' to put to DEHP IV exposure. Phthalates are known reproductive toxicants, linked with incomplete testicular descent, smaller scrotums, lower testosterone levels, inferior sperm quality, and increased rates of testicular tumors resulting in smaller genitalia in rodent studies (Shea and Committee on Environmental Health 2003). These are quite personal health effects; parents may be uncomfortable using their child as an organizational tactic. This is particularly true if health problems develop as a result of long NICU stays, in which case family strain and stress is likely already to be at a high point. Moreover, 'victim' stories or attempts to make the health care industry look irresponsible have not been adopted as movement strategies. This lack of focus on victim's stories perhaps stems from a reluctance to focus on what may become an issue of liability or medical malpractice claims for the health care industry.

Ethics Frame: Right Thing to Do

PVC concerns are couched within the rhetoric of "First, do no harm" a phrase originating from the Hippocratic Oath, and often expressly linking human health and the environment. Catholic Healthcare West (CHW) frames their commitment as stemming from their mission of environmental responsibility. As a Catholic healthcare ministry, CHW is sponsored by seven orders of Sisters, or 'sponsors,' who prioritize ethically-based decision-making. In Sister Mary Ellen, CHW's Ecology Program Coordinator, words:

One of the reasons, why we did this, is, because it's just the right thing to do. Our mission requires that we act as responsible stewards of the environment...we're just committed, you know, to providing these health care services in a way that optimizes patient health, and that has to go with the planet. So, planet health, planetary health as well.

Awareness of the interconnection between environmental health and human health means that while PVC is at times the primary focus, it is also often framed as part of a larger movement addressing the overall ecological footprint of the health care industry. As Stacy Malkan told me, Health Care Without Harm (HCWH) more broadly defines its goal as “greening the health care industry.” For many nurses, awareness about the connection between the environment and human health is reflected in their attitude towards patients. Ann Converso, a nurse for thirty-three years and Vice President of the United American Nurses, expresses their concerns:

Okay, what products are we using, not only that we come in contact with, but our patients come in contact with...Where do they come from, what manufacturer, how do they manufacture them, and then, when we are done with them and we throw them in the garbage can, where are they going, how many of them are going? I mean, the health care environment is the top producer of pollutants and garbage and waste and stuff. And those go back out, and what many of them do, is bring you your next set of patients – because of the pollutants in them.

In *The Ethics of Environmentally Responsible Health Care*, Pierce and Jameton (2004) claim, “professional code of ethics are beginning to reflect [an] increased sense of responsibility for the environmental as well as financial costs of health care” (p. 44). Rosemary Stevens (2001) further argues for the medical profession to emerge as moral leaders, aided by its authority and inherited reservoir of goodwill. Ethical positions were expressed by other members in the movement, either about themselves, their organizations, or health care workers more broadly. As Joe Thornton, author of *Pandora’s Poison* sees it, “I think it’s that, people who are involved in this are people who have general concern about the environment and about environmental politics in particular and so they’re motivated by a sense as a citizen and also from their place in their profession...” Stacy Malkan concurs with this synopsis, “...the health care industry in general tends to be full of people who really want to help – be healers.” Lynn Garske, Environmental Stewardship Manager for Kaiser Permanente, voices a similar understanding, noting, “the people who go into healthcare have a desire to make things better.”

Activists draw on ethical commitments to public health and environmental stewardship in their motivational framing. Efforts to recruit or mobilize health professionals are framed as honorable and moral actions. In *The American Nurse*, the

official publication of the ANA, Charlotte Brody (1999), an RN and a founder of HCWH, enjoins nurses to become involved, and not to wait until there is absolute proof that DEHP leaching is responsible for the decline in sperm count or an increase in kidney disease in U.S. males. To wait, she implies, is the equivalent of “large-scale human studies of the effects of toxic chemicals” (p. 5). And to do so “would be unethical [and] it would be immoral” (p. 5). The framing used in a brochure developed for nurses is similar: “Our patients, their families and our communities are under threat. We have an obligation to learn about this threat, engage our nursing skills, speak the truth, and guide public policy for health environments. We must honor our covenant with the public and the public’s health” (ANA et al. N.d.). By linking ethical obligations with their occupational role, these appeals highlight how the relation to the problem of movement protagonists and their potential constituents influences the framing process.

In 1998, the U.S. Environmental Protection Agency (EPA) and the American Hospital Association (AHA) signed a Memorandum of Understanding (MOU) to form Hospitals for a Healthy Environment (H2E). The MOU was an explicit public/private partnership to encourage stakeholders to voluntarily commit to reducing the ecological impact of health care facilities. The formation of H2E further institutionalized health care’s involvement in the effort to phase-out PVC. While not legally binding, this agreement taps into the ethical concerns of health care professionals observed by Thornton, Malkan, and Garske. As mentioned in chapter three, the American Hospital Association, the U.S. Environmental Protection Agency, Health Care Without Harm, and the American Nurses Association jointly founded H2E. In theory, H2E represents millions of health care professionals, all of whom regularly use PVC medical devices or products. The ANA alone represents the nation’s 2.9 million Registered Nurses. Certainly, only a small percentage of these RNs may be aware of their respective organizations participation in H2E; however, as an organization, the ANA has a high and active level of involvement. Another 37,000 individual members belong to the AHA, which also represents 5,000 hospitals, healthcare systems, and providers of care. AHA members are in positions to determine product selection and disposal methods including: environmental services, safety departments, green building experts, administrators,

clinical staff, pharmacists, laboratory staff, and food services (www.cms.h2e-online.org). H2E partners also include Group Purchasing Organizations (GPOs) and product vendors, manufacturers, and distributors of medical products. Recognizing the different relationships various partners have to production or their relation to the problem, H2E recommends adoption of goals and activities appropriate to the type of organization. In congruence with the movement's focus on changing consumption patterns in hospitals, GPOs and vendors are encouraged to train staff in environmentally preferred purchasing (EPP) and to provide EPP information to customers. While H2E signifies a shift in the industry's response to environmental sustainability, there is a significant range among the organization's partners with regard to their relation to the problem and their commitment to significant operational changes within the industry.

Resonance

The appeals to patient and/or children's health and ethical responsibilities are frames that "resonate" (Snow and Benford 1988) with health care professionals. Benford and Snow (2000) point to two interconnected factors that help explain frame resonance: frame credibility and frame salience. In the previous chapter, I provided examples of movement stakeholders using, or attempting to use 'credibility' as a frame enhancer. In the health care industry, movement protagonists hold frame articulators to high standards, particularly when making scientific arguments. Ed McNeil, a registered nurse for twenty-five years and supervisor of a neonatal intensive care unit (NICU) in Oregon conducted extensive research on the risks of DEHP and PVC before deciding to go PVC/DEHP-free in the NICU. McNeil purposively sought peer-reviewed research articles and "legitimate," government publications from a range of countries, including Japan, Denmark, Canada and the European Union, as well as from the state of California and the U.S. Food and Drug Administration. It was important to McNeil "to differentiate solid...research-backed articles" published by established organizations and governments as opposed to information based solely on "people's personal fears and worries and you know, whatever statements people just individually make about whatever subject they are upset about." In McNeil's efforts to include the perspectives of a range of stakeholders, he purposively sought information even from those organizations that contended, "this is

ridiculous, the evidence is really slim. This is a lot of work and effort to take a product out that um, that's probably not all that dangerous.”

Salience, the second factor affecting frame resonance, may partially explain the success of mobilization within the profession. The higher the degree of salience for a targeted audience, hypothetically, the more likely potential constituents will become active in the movement. “Experiential commensurability” (Benford and Snow 2000), or the congruence and resonance “with the personal, everyday experiences of the targets of mobilization” (p. 621) holds particular relevance for health care professionals whose jobs are based on close observations of patients and noticing changes in health or behavior. For example, PVC tubing has not been used in Ed McNeil’s NICU for over ten years because as McNeil notes, “nurses observation skills tend to be pretty well-honed.” NICU nurses had noticed that, “if we would put a PVC tubing down into a baby, you’d pull it out at two or three days and all of the plasticizer had leached out and it would be really hard and stiff and kind of pokey on the end of the thing and would be stained with gastric juices and so on.” In this NICU at least, the decision to move away from PVC tubing preceded serious mobilization against DEHP. However, because nurses and other health care professionals engage in similar observational behavior (e.g. relate to the problem similarly), their experiences with PVC medical devices likely correspond with those of the NICU nurses in Oregon described by McNeil. Thus, the framing of movement protagonists resonates with their own experiences. As users of PVC in its middle stage, health care professionals are motivated by their own observations, their concern for patients, and their sense of ethical responsibility.

Why Nurses?

The success of the anti-PVC movement within health care relies heavily on the participation of health care professionals, and nurses in particular. There are several factors that account for the involvement of nurses within the anti-PVC movement. As addressed in the preceding section, children’s health and ethical framing resonate with many nurses. Nurses are also targeted by environmental health organizations to join the movement; however, the influence of their profession’s history and the practice of

nursing may also positively affect the likelihood that nurses become involved in the movement.

Attention to and concern for environmental health as a core value of nursing can be traced back to the roots of the nursing profession. The formative years of the nursing profession “adopted a holistic approach toward health promotion and the prevention of illness and injury” at a time when “the interaction of the environment and health was difficult to ignore” (Institute of Medicine 1995:13). The practice of nursing requires knowledge and skills focused on ‘health’, which is defined more broadly than simply the absence of disease (Peters 2002). Motivational framing techniques appeal to the legacy of Florence Nightingale who is credited not only with founding modern nursing, but for recognizing the link between one’s environment and one’s health (Institute of Medicine 1995; Trossman 2005). In Nightingale’s view, “the role of the nurse was primarily to modify the environment in ways that enhanced health and healing” (Institute of Medicine 1995: 13).

The American Association of Colleges of Nursing (AACN) denotes altruism, autonomy, human dignity, integrity, and social justice as the core values of nursing (1998). Undoubtedly, the personal embodiment of these values is variable; however, nurses are nonetheless socialized through their education and professional culture. Murphy et al. (2005) contend nurses have a rich history of advocating for change through politics. They cite nurses such as Lillian Wald and her work for the “poor, disenfranchised, and powerless,” Lavinia Dock and her activism within the women’s suffrage movement, and Margaret Sanger’s activism in the birth control movement as important examples of nurses as agents of social change. Marian Condon, Masters in Public and Community Health and Senior Staff Specialist in the Center for Occupational and Environmental Health at the American Nurses Association adds, “It’s the professional calling (*stops saying ‘calling’ to say*), it’s the discipline. It’s just how it’s grown up.” In their study on nurse participation in health policy development, Gebbie et al. (2000) found that many nurses involved in policy formation “perceived that activism is inextricably linked to health care and care is what nursing is on about” (p. 309).

Nurses cite current laws designed to prevent “needlesticks” as a good example of the strength of nursing activism. In 2000, the Needlestick Safety and Prevention Act passed as the result of organized efforts of nurses at the state and national levels. The Act was designed to decrease needlestick injuries and nurses’ exposure to more than 20 bloodborne pathogens, including Hepatitis C (HCV), Hepatitis B (HBV), and HIV. Hospital nurses are the most frequently injured occupational group at 49.7 percent, followed by physicians at 12.6 percent annually (OSHA N.d.). According to Marian Condon, nurses “worked on them [needlestick laws] within ANA, going to the different state legislatures until it just became a federal issue. Working at the local and state levels has proven to be a *really* successful strategy, and needlestick laws serve as the ‘perfect example’.” A 2001 UAN resolution on nurses role in product selection explicitly linked nurses’ “increasingly visible role in device selection as a result of the Needlestick Safety and Prevention Act requirements [to asserting that] these actions should include products free from polyvinyl chloride” (2001). Foley (2002) also points to successful nurse involvement in national and state ergonomic plans. Currently, nurses at all levels—nationally, state, and local—are involved in the development of comprehensive chemical policies.

There are over 2.9 million nurses, making them the largest group of health care professionals in the United States. As the first point of contact for patients entering the health care system, nurses are well positioned to observe environmental conditions or exposures, leading to a more accurate assessment and treatment (Institute of Medicine 1995). Ann Converso, Vice President of the United American Nurses, acknowledges that nurses do not regularly conduct close environmental assessments of patients, but when asked if nurses are in a better position than physicians to be aware of some of the environmental problems patients face, she responds:

Yeah, I do. And I don’t mean that as a knock on the physician, okay. But if you look at it, the nurse does an assessment when they come in. They should be doing that kind of assessment about the environment. And, the nurse obviously, is in a position to do that... They’re with those people – somebody said to me once – oh my God, the doctor ran in at 2 o’clock in the morning, he saved my life. Who called him? I did. I did. And I don’t mean ‘me’, I mean ‘I’ the nurse. That’s how the Doc got there at 2 o’clock in the morning. He didn’t just wake up out of his sleep and know you’re having trouble. I think that we are always in a position to have more contact with them, know more, we meet their families much more, that has a lot – you know, a lot you can get from the

families also. Yeah, I think we are in a great position to do a lot more work about the environment with those families and then patients that we do.

Converso's comment highlights that as a frequent first point of contact for patients and their families, nurse-patient interactions are often the most important. Nurses are responsible for responding to information requests and through this role can help educate the community on public and environmental health issues. While nurses usually do not have a background in toxicology, they are familiar with pharmacological principles, which provide a frame of reference to understand the toxic effects of hazardous chemicals (Welker-Hood et al. 2007). For these reasons environmental health organizations purposively target nurses for involvement in the movement. Stacy Malkan of HCWH says,

Nurses have been very strong partners with this work. More so than doctors, but we do have doctors involved and we work very closely with Physicians for Social Responsibility, another group. But, the nurses really get fired up. And they really you know just 'get it' about how it's smarter to take a precautionary approach than wait until somebody gets sick and you have to treat them later."

Neha Patel, the first Program Director with the Oregon Center for Environmental Health, reiterates this high praise. In her attempts to communicate with statewide hospitals, Patel states that waste managers were the first place she would go to establish a contact.

However, over time she learned "if you really want to see results," you go to the nurses.

In Patel's experience, nurses are:

Very motivated, more so than other professionals that are in health care, because they work on the floor, but then they also have sort of that public health knowledge, you know. And, they can be really strong advocates within their system. So some of our most successful projects have been ones that have been led by nurses in their various facilities...And often they can be sort of the shepherds in their hospitals to engage others. Doctors are really a lot more challenging to get on board – I know that's a huge generalization, there are some out there that are great. But it is hard to engage them. Part of it is probably their busy schedules, or it's hard for them to sort of prioritize, prioritize these issues. So we tend to do a lot more work with individual nurses in the facilities and then eventually it might lead to a Doc that is also supportive of these issues.

In an effort to recognize some of today's leaders in greening the health care industry, HCWH created The Luminary Project, an effort to shine light on nurses who have who have strategically addressed environmental problems in their own hospitals,

communities, or unions.⁴ Not all of these nurses are specifically recognized for their activism on PVC/DEHP, although they are all acknowledged for their role as environmental health advocates. In turn, luminaries serve as role models for other nurses to emulate. HCWH works to motivate and inspire other nurses to become environmental health advocates through their Nurses Workgroup and through targeting and recruiting champions in health care facilities.

A ‘champion’ is a nurse who has either recognized and stepped up to fill a need or a nurse who became a strong advocate for change. Describing the importance of nurses, Marian Condon states,

if you can get a few champions for these issues within different departments, you can...you need the strong leadership in the different facilities to um, to talk to the purchaser. Also, the hospitals have to have health and safety committees. So, nurses can sit on those as well. And then can influence um, what different policies...patient safety too. Well, nurses can sit on different committees have their voices heard that way – just in the hospital.

UAN Vice President, Ann Converso expresses similar sentiments:

I think it’s about exposing the nurses, teaching them about it [environmental issues], and then you sort of find that person – sort of like me, that goes, ‘get out of here! I didn’t know that. That’s unacceptable,’ you know and sort of takes it out as a champion.

Nurses are encouraged to start or join pollution prevention committees, become involved in purchasing decisions, or to join working groups. HCWH sees the role of champions as “creating positive environmental change from the inside” and has strategically targeted nursing specialty organizations. As an example, in 1999 HCWH targeted the American College of Nurse Midwives (ACNM) and over the course of the next four years, educated and trained them on environmental health issues (Sattler 2003). Together HCWH and ACNM produced *Green Birthdays: Important Information Every Health Care Provider Should Know About the Environmental Safety of the Birth Place and Practical Steps to Reduce Their Own and Their Patients Exposures to Toxic Chemicals*. HCWH and ACNM relied on the children’s health frame to generate concern among obstetric care providers about the impact of toxic chemicals on their patients and in the breast milk of mothers. Through prognostic framing, they encouraged these

⁴ The Luminary Project includes both women and men. However, in a reflection of the gendered nature of the nursing profession, most of the luminaries are women.

professionals to reduce the levels of industrial chemicals in birth settings as a meaningful step to reducing future contamination.

Power to Address

The occupational status of those involved in the movement lends credibility, legitimacy, and a 'professional voice' to Public Interest Health Movements. Professional organizations are able to capitalize on their existing resources, including knowledge, interpersonal interactions, credibility, and legitimacy (Hara and Estrada 2005). The power to address the problem is influenced by the collaborative approach to the movement, the size and economic stability, and strength of some of the organizations and businesses involved, and by working within the system.

Movement participants widely recognize the significant role HCWH plays in the framing process and in advancing the movement. As an international coalition HCWH is able to partner with a wide range of organizations and hospitals or health care systems, and community or religious groups. Moreover, HCWH supports and collaborates with other professionals, labor unions, and environmental health activists. HCWH's impact is thus much greater than its sixty full-time and part-time staffers and its legitimacy is gained from the authority and credibility of many of its member organizations. Lynn Garske of Kaiser describes the relationship between Kaiser and HCWH as "very symbiotic." Kaiser often serves as a successful example or case study for HCWH and HCWH helps provide information, tools, or leverage when Kaiser works with other healthcare organizations. As Garske describes, "...it's a lot easier to get PVC-free stuff when you have half the healthcare industry in America ask for it, as opposed to one system – no matter how big."

According to Malkan, HCWH sees its role with hospitals as resource provider and an educator. The organization's tactics include: conducting research, talking to manufacturers, and working with group purchasing organizations to make sure they offer alternatives. HCWH is the organizer of CleanMed, the world's largest health care conference on environmentally preferable medical products and green building (www.noharm.org). CleanMed started in 2001. PVC use was listed as one of the five areas in which purchasing choices make a difference. Eliminating PVC and DEHP has

remained on the agenda. At the 2006 CleanMed conference, the nation's leading Group Purchasing Organizations representing more than 70% of buying power for the U.S. health care industry, announced support for labeling PVC medical products and offering alternatives. Malkan maintains that a key to their success has been through their cooperative relationships with industry:

HCWH is sort of a new way of environmental organizing – that partners with industry to make a change...So, that when we're working on the PVC problem, we talk to people in healthcare using the products, the group purchasing organizations that are putting in the contracts, with manufacturers that are making it, the scientists who know about the problems with the chemicals, and the people who can do the research on the alternatives.

HCWH's approach is to work within the system. 'Working within the system' is the third characteristic of the PIHM and is discussed in greater detail in the following section.

The power to address is affected significantly by an organization's size. In many social movements, size is measured by the number of movement members. In this movement and other PIHMs, size generally reflects economic, political, or social power. Since market transformation is the primary tactic to achieve the goal of phasing-out or eliminating PVC, financial influence supersedes many other tactics of persuasion. Commenting on the influence governments and their agencies can have, Ed McNeil remarks:

So when somebody like Health Canada speaks up, and the Canadians say we're just going to do everything we can to get this out...remove this from use. Or then something like the state of California jumps up and then it's sort of like, 'well, we don't want to have to just build a new plant just to serve California because they are a big market, so we might as well just switch over the rest of the country.' In the same way that California had driven changes in exhaust emissions for cars, they ended up driving the truck on this, because everyone else went along. So, those kinds of things actually probably have more an impact than anything. I think [it] is when a when a large enough group speaks up and says, we're going to insist that this change, then it becomes an issue.

A key similarity between Catholic Healthcare West and Kaiser Permanente may help to explain their involvement. In addition to both being large, both are not-for-profit health care systems.⁵ While Lynn Garske of Kaiser said little on this, her response to the question, 'What differentiates Kaiser from other healthcare organizations in terms of its environmental decisions?' included, "we don't have a for-profit board of directors asking us about - why are we spending money on this program, that type of thing." On the other

⁵ At Kaiser, physicians are a separate entity and represent the only for-profit group in the organization.

hand, several interviewees with Catholic Healthcare West detailed the influence being a Catholic, and not-for-profit health care system put on environmental stewardship. On a three-way conference call, when asked explicitly if being a not-for-profit versus a for-profit enterprise made a difference in terms of environmental approach or commitment, all paused, until Sister Mary Ellen, blurted out “I’ll say it! Yes!”, to which everyone laughed. Sister Mary Ellen went on to say that rather than answering to a Board of Directors, Catholic Healthcare West answers to and is directed by their sponsors, who are female religious organizations, the majority of whom emphasize the environment in their mission and values.

HCWH has had greater success working with non-profit hospitals.⁶ Stacy Malkan says, “you know a lot of the hospitals that we work with are in the non-profit sector so we’ve had a harder time breaking into the for-profits sector hospitals for whatever reason. Maybe it’s hard to make change in those institutions.” Research on distinctions between not-for-profit and for-profit hospitals primarily examines differences in services, internal hospital characteristics, the regulatory environment, and the hospital legal charter (Potter 2001). Although calls for both nonprofits and for-profits to improve their environmental performance have been made (Messelbeck and Sutherland 2000), very little has been written comparing the two in terms of commitment to environmental stewardship.

In large healthcare organizations such as Kaiser and CHW, the movement away from PVC appears to have largely come from management rather than healthcare professionals. Health care institutions are stratified not only by profession, but as Stevens (2001) notes, there is an assumed ‘necessary antagonism’ between health insurers as the symbol of business and the ‘ideal’ medical profession (2001:338). Stevens (2001) points out, the tendency for health care corporations and the medical profession to view each other antagonistically “may block the potential for confident, proactive, and innovative leadership in the future” (p. 338). However, more than this, it enables health care corporations to set the social and public health agenda, without the input from the professionals who are the actual practitioners of health care. Were

⁶ On the flipside, HCWH or other organizations with 501(c)3 status are more constrained in their power to politicize issues, given the limitations of their non-profit status.

healthcare organizations such as Kaiser, to more actively engage with the healthcare professionals employed within their organizations, theoretically the PVC/DEHP issue in medicine could become much more politicized or at least attended to if those professionals presumed a more active public health role. At minimum, “participatory power” (Frankfort 1997) might further the goals of ‘greening’ health care. However, as it stands, these large health care systems reap the ‘social rewards’ as environmentally friendly healthcare providers. Public perception of medical professionals as public health leaders does not emerge. Put otherwise, while size matters when it comes to promoting market change, if a shift in public awareness and understanding of public and environmental health issues is desired, the movement’s largest organizations should actively encourage those professionals with credibility and knowledge to become active within the movement. As Stevens (2001) further notes, “Visionary leaders within the [medical] profession...may be thwarted in the search for national allies because of the decentralized, competitive power structures of the health care system” (338).

Similarly, the contributions of nurses to the anti-PVC movement are not always encouraged or sought by stakeholders. I posit that there are two primary and intersecting reasons that account for this oversight: professional prestige and occupational power and gender. While health care professionals in general are marked by a high degree of professional prestige, in a stratified workplace physicians rank higher with regard to status, social standing and/or social class and autonomy, than nurses, a profession largely dominated by women workers. In 2005, women comprised over 92 percent of RNs and over 93 percent of licensed practical nurses or licensed vocational nurses (LPN/LVNs). In their study on nurse participation in health policy development, Gebbie et al. (2000) found that some nurses felt their input was discounted and felt perceived as being less intellectual than other professionals.

In our interview, Marian Condon and I discussed whether lack of involvement or encouragement of nurses may stem from different gender expectations. In Condon’s view, “there’s a lot of interesting things coming from us [nurses] being predominately female – the power structure in the hospital, all of that.” When I asked what she meant by the power structure in the hospital, she responded:

...traditionally nurses have been subserv.. (*she starts to say subservient, but cuts herself off before she decides that it's acceptable to do so*). In the '40s and '50s and maybe the beginning of the '60s have been very subservient to doctors and it was perceived that that's really what their mission was. But,...Nurses have been trying to establish their own identity separate from medicine.

Condon clearly recognizes the occupational differences between physicians and nurses, but intimates that this important distinction is not fully recognized by the majority of those in the health care field:

...medicine is different from nursing and people don't seem to realize that. They are two separate and different disciplines. Nurses are not little doctors. They go about – that's why a lot of times nurse practitioners are so...people like them, nurses take more of a holistic approach. They don't just talk about medications. It's just a whole different discipline.

Peters (2002) echoes these concerns when arguing, “Knowledge derived within the discipline of nursing is undervalued and underutilized in today’s health care delivery system” and, further, “...a major issue facing the health care system today is its failure to recognize and reward the contributions of nursing knowledge” (p. 1).

Barriers in Health Care

There are a number of barriers that health care professionals must overcome that may help to explain a reluctance to address PVC environmental and health concerns specifically but also more general environmental and occupational health issues. First, environmental health education is extremely limited in nursing and medical schools. Medical knowledge is transferred through medical education, training, and practice, all influential in diagnosis, treatment, and patient recovery. The average classroom time for occupational and environmental medicine combined is estimated at six hours (Institute of Medicine 1999). Second, medical training focuses on the individual patient with disease, rather than approaching health from a population-based perspective, contributing to a limited knowledge of public health issues among health care professionals (Institute of Medicine 1995a). Similarly, in the practice of their professions, physicians and nurses exhibit a curative perspective rather than a perspective that is more preventative in orientation. Third, environmental and occupational health problems are often complex and time consuming to understand, diagnose and treat. Appropriate diagnosis for toxicants and chemical exposure is complicated by the ubiquitous and typically invisible

nature of toxic substances, the difficulty of detection and determining chemical exposure, the long latency periods between initial exposure and resulting disease, the absence of national reporting systems for environmentally-related illnesses, and problems with enforcement and the setting of threshold limit values (Institute of Medicine 1995; O'Brien 2000; Kerns 2001;).

Unions

Organized workers have a different kind of power to address than non-unionized workers. Unionized workers have the collective strength of the labor union, unions have established channels for disseminating information, and unions have mechanisms or procedures in place for problems in the workplace. Unions use collective bargaining to improve working conditions, establish grievance procedures, and to determine wages and benefit packages. Representatives for the two labor unions interviewed in this study, the United American Nurses (representing RNs in 27 state affiliates, with 102,000 members) and the International Association of Fire Fighters (representing career firefighters throughout the U.S. and Canada, with 280,000 members) stressed the importance of their labor contracts in terms of health and safety protections.⁷ Labor contracts are the products of negotiations through collective bargaining between workers and their employers. Ann Converso, Vice President of the UAN since its inception, states, "We believe very strongly in our contracts. That is something to me; I don't know how to live without a contract 'cause I've had one my whole working life." These differences lead unions to construct the problems of PVC with a greater emphasis on worker health. The diagnostic framing of the IAFF in particular reflects the hazards fire fighters confront from burning PVC.

The International Association of Fire Fighters

On September 11, 2006, an unexpectedly drizzly, gray, and cool day in Washington D.C., I took the F2 bus Columbia Heights to the Federal Triangle. I was looking for the United Nations Building on New York Avenue. Housed inside was the headquarters for the IAFF where I had an interview scheduled with Richard Duffy,

⁷ UAN is a fairly young union. It was founded in 1999 by nurses within the ANA. The UAN became a chartered affiliate of the AFL-CIO in 2001.

Assistant to the General President in the Division of Occupational Health, Safety, and Medicine. The significance of the date was not lost on me and I had been more than a little concerned that the interview would not take place. It turned out that the only glitch involved a switch in interviewees. At the last minute, Duffy had been called to testify at a trial in Dallas. In his place, the executive secretary had arranged for me to meet with Patrick Morrison, Director of the Department of Occupational Health and Safety and Ron McGraw, Occupational Safety and Health Assistant.

Health and safety protections are extremely important to nurses and fire fighters. The IAFF is working very hard to get safety mechanisms and firefighter protective gear into their collective bargaining agreements.⁸ Cancer presumption legislation is also used to protect and provide for fire fighters who have developed cancer from on the job exposures. Patrick Morrison holds, “if you were a firefighter and you came down with cancer, that’s why you belong to our union. Basically, what we’re saying is that we will help in any way possible to get you what you are entitled to as far as the protection and coverage.” In those states that have states cancer presumption laws, certain cancers are ‘presumed’ to have developed from the course of a fire fighter’s duties. As McGraw explains, presumption laws alter the burden of proof. “It changes the burden of proof from the employee to the employer. Every state is different.” Presumption laws can also cover other health problems, such as heart, lung, or infectious diseases. Tactics are undertaken to minimize employers attributing health problems to lifestyle choices. The majority of fire fighters undergo health screenings prior to starting their jobs and ‘no smoking’ policies are imposed on fire fighters to ensure that any health problems cannot be inaccurately attributed to lifestyle behaviors. Morrison went on to add, “We will actually [be] sit[ting here] and I will be talking to you and my computer will have a message and it will say another firefighter died of cancer. And we will get them... almost one a day from around the country.”

The safety and health of fire fighters are the chief concerns of the IAFF. Burning PVC exposes fire fighters to extreme risks. McGraw describes the IAFF’s concerns:

⁸ Specifically, the IAFF bargains to get a comprehensive health document (the Wellness Initiative) and two sets of turnouts into their contract.

When it burns – the chemicals that are produced when PVC burns or vinyl burns and it's in *everything* (emphasis his). In a house, there's so many places where plastics, PVC, vinyl are in the furniture, in the piping, in everything – when it burns the chemicals that are produced are just horrendous, very carcinogenic. We get large exposures, whether it's inward seepage from their mask when they are wearing it or when it it's in the overhaul period [after the fire is out]...particularly in the overhaul period where it's very cumbersome to wear the full breathing apparatus that firefighters wear. So, a lot times in the overhaul process when it's deemed safe [in terms of]... carbon monoxide [levels], there is still off-gassing of other products [and] from the PVC that the firefighters inhale and that's very carcinogenic.

Both McGraw and Morrison point out that PVC is just *one* of the many hazards fire fighters confront. It is hard to separate the effects of PVC on fire fighter health from the hazards posed by a veritable toxic soup of other synthetic plastics. These effects include acute problems such as decreased respiratory or lung function as well as neurological symptoms.

The UAN's tactical approach has been somewhat different. Over the past several years, the UAN developed model contract language intended to decrease health risks associated with the health care industry. This language was designed to give nurses a more powerful voice in the purchasing and waste disposal decisions of hospitals, and to use the grievance process if the hospital is not in compliance with certain OSHA standards. The UAN's model contract language includes suggestions based on the OSHA Hazard Communication Standard, Joint Labor/Management Occupational and Environmental Safety and Health Committees, Joint Labor/Management Purchasing or Product Selection Committees, language on specific hazards. Through collective bargaining, some local UAN affiliates have successfully bargained for environmental health language in their contracts. Converso says the model contract language was originally intended for nurses but is also applicable to other employees, and in fact; the UAN collaborated with other unions on the project. In Converso's view, the language provides for nurses to be actively involved in decisions that not only effect worker health, but patient health as well:

You know, do you have a purchasing committee in your facility? Is there a union representative on that? Do you pick the products that come into your facility? Do you have a labor management meeting that talks about issues—when they are stripping the floor and employees are telling you they can't breathe—where does that go?... We put it [contract language] into categories and we are going to push that out to the field and tell people, look at this language, and work to get it in your contracts, so that you will have

protection against environmental exposures and not only you, but your patients in the communities in which you live.

Fire fighters have another asset that influences their power to address that is not directly tied with their union status: credibility. Morrison points out that studies show that “We are the number one trusted worker in the workforce. We go into people’s homes and see them on their bad days and we take care of them. So when we show up, it’s always a positive thing.” McGraw adds, “every year surveys show that fire fighters are the most respected public servant.” McGraw and Morrison also recognize that this trust may translate into more legitimacy for the IAFF compared with other occupations and unions. However, when it comes to taking political positions, as in the case of politicizing PVC, the IAFF is cautious not to abuse this high level of trust. According to Morrison, the IAFF has “absolutely” taken a position on PVC: “that it’s dangerous.” This has not translated into a public or official stance, however. The IAFF is very careful in choosing which battles they will pick. Politically, they are fairly non-partisan. The question for the IAFF is, “are you helping us with our issues? If you are, then we’ll endorse you.” From a labor standpoint, Morrison adds, “If you are not politically active in your union, you are not helping your members.”

Fire fighter’s relationship with industry may be more complex. On the one-hand, the chemical industry produces many of the toxics that injure and kill fire fighters. On the other hand, some chemicals produced by the chemical industry are used as fire-proofing. At times the IAFF works with companies such as Dupont to make safer equipment or to design protective clothing. In part, the IAFF works with industry because they need to “understand exactly what it is and what kind of harm it can cause if you are exposed to it.” Morrison acknowledges, “This does come from those same companies that produce maybe some of the kind of chemicals that hurt us, but at the same time, they do manufacture things that help us.” Morrison is unequivocal in his statement that the IAFF is “not afraid to take anybody on as far as when we think we have to put something out there and we will...we don’t consider anything a conflict of interest when it comes to fire fighters’ health and safety.”

On a more local level, it is worth noting that the Oregon state IAFF endorsed a

Eugene, Oregon based environmental health organization, the Oregon Toxics Alliance's (OTA), Vinyl Out of Oregon (VOO) campaign in 2004, though they later rescinded their endorsement. The Eugene IAFF Local 851 retained their endorsement. A letter written to the OTA by then IAFF state president Pat West indicated that there remained uncertainty regarding the toxic effects of burning PVC. There is some suspicion among OTA members that representatives of the vinyl or chemical industries may have approached them. David Monk, OTA's Board of Directors President reported that his phone calls went unreturned. Monk says he can only make guesses as to what transpired. Monk promised the state IAFF that he would not use their endorsement in any way they were not comfortable with, but surmises that they may not have trusted this pledge. It may also be worth noting that Margie Kelly, a former Greenpeace activist and Joe Thornton's wife, was instrumental in kicking off the VOO campaign. Perhaps equally significant, when I asked my vinyl industry representative about their major opponents, OTA was among those he listed.

Working Within the System

The health care anti-PVC movement is largely comprised of professionals, environmental health organizations, healthcare systems or facilities, and other related businesses within the industry. As a PIHM, it seeks to change the system from within rather than trying to challenge and push for change from outside the system. Through working within the system and recruiting nurses and physicians by appealing morally to a philosophy of 'do no harm,' public health and environmental health advocacy groups have been quite successful to the point where by and large, phasing-out PVC, or at the very least DEHP, has become mainstream, or at least uncontroversial.

Tactics

Movement participants engage in a variety of tactics to achieve their goals. As discussed elsewhere, the anti-PVC movement is largely directed at market transformation and education within the health care industry. In this sense, tactics are either directed outward, through strategies promoting change in the market and through pressuring other organizations, or directed within the profession, through efforts to educate and recruit additional movement members. Tactics are not always distinctively either externally or

internally directed, but function differently depending on their target and framing. Similarly, tactics may have manifest and latent functions. Certain outward directed tactics manifestly function to draw attention to and challenge the use of PVC, while they also latently function to create awareness within the health care industry. Depending on context and intent, a particular tactic may be balanced between the two. Outward tactics generally serve to politicize PVC and include: passing resolutions, shareholder resolutions, publications, lobbying, contract language, pushing for alternative products and labeling products (i.e., environmentally preferred purchasing), adopting and encouraging precautionary approaches, submitting comments, and/or both petitioning government agencies or other decision-making bodies and working with government agencies. Those tactics that are more clearly aimed at education within the profession include: encouraging nurses' involvement/seeking 'champions,' using listservs for discussion or providing expertise, publishing educational and guidance materials, holding teleconferences and roundtables, and developing and promoting the Green Guide for Health Care. Tactics that more clearly overlap between the two include: organizing and participating in conferences, engaging in collaborative work between environmental or environmental health organizations and health care professionals, promoting alternative disposal options, writing and publishing research, reports, and white papers, and Internet based activism.

Outward Tactic (Market)

The anti-PVC movement relies heavily on market driven campaigns in their efforts to eliminate the environmental and health risks associated with the PVC lifecycle. Emphasis is directed at the changes that producers, vendors, and users of PVC can make to address these problems. In this way, movement participants take an institutionalized reformist approach to politicizing PVC. Movement participants emphasize alternatives, arguing, "there is no reason to use PVC [or DEHP] when there are alternatives" (interview, Condon). Their vision for a more sustainable health care industry involves "really advocating for safer non-toxic materials and creating the markets for safer non-toxic materials" (interview, Malkan). Focus on market change and new products implies confidence in technological developments as a solution to PVC related environmental

and health problems. As argued elsewhere, the goal is not to change the health care industry, but to seek changes within the system that will 'green' the industry.

Implicit in this movement ideology is the belief that further modernization of production and consumption is able to go hand-in-hand with sustainability. This approach is reflective of the core tenets of ecological modernization theory as described by Mol (1997) and Mol and Sonnenfeld (2000). Contrasted with the counter-productivity or deindustrialization theorists and the neo-Marxist schools of thought in the 1970s and 1980s, the emergence of ecological modernization theory in the 1980s challenged the "environmental movement's traditional ideal that a fundamental reorganization of the core institutions of modern society (the industrialized production system, the capitalist organization of the economy and the centralized state) was essential in entering a path of long term sustainable development" (Mol and Spaargaren 2000). Whereas science and technology had largely been evaluated for their deleterious contributions to environmental problems, they now were valued for their potential to solve and/or prevent them (Mol and Sonnenfeld 2000). A second core tenet of ecological modernization theory emphasizes the growing importance of market dynamics and economic agents in moving toward ecological sustainability. Also unlike the predominate contentions of the 1970s environmentalism and environmental theorists, economic growth and ecological sustainability are not viewed as incompatible, rather many now believe reformed economic development can lead to environmental improvement (Mol 1997). Third, the state "command-and-control" approach to environmental protection and regulatory activities are supplanted for a more flexible and participatory style of governance. With particular relevance for the anti-PVC movement, this tenet proposes that environmental reform comes from the actions of private economic actors, in part through certification of products and processes, environmental audits, and through competition based on environmental performance and the creation of niche markets. Lastly, according to ecological modernization theorists, social movement involvement in environmental reform moves significantly from the periphery to the center of decision-making. While movements remain independent, they nonetheless work with the state and private actors in their efforts towards environmental sustainability.

In this section, I focus predominately on the complimentary aspects of the anti-PVC movement market-driven campaign. This campaign is largely reflective of ecological modernization theory's core tenets. First, organizations such as HCWH broadly target manufacturers, Group Purchasing Organizations (GPOs), hospitals, and healthcare systems or facilities to produce, provide, or switch to PVC alternatives. In regards to the latter, Neha Patel notes, "Often that's the easiest way to get in the door is if we can sort of present some opportunity or some sort of change in their practice that would result in cost savings." As a motivational frame, or call to action, movement adherents emphasize the financial benefits of greening hospitals and medical facilities. In part, this is to counter the perception that 'green' is costly. But predominately, this argument is made because their approach is to work within the system, thus finding solutions within the system.

Movement protagonists propose environmentally preferable purchasing (EPP) as a solution to reducing PVC use. Hospitals for a Healthy Environment defines as "the act of purchasing products/services whose environmental impacts have been considered and found to be less damaging to the environment and human health when compared to competing products/services" (www.cms.h2e-online.org). Once hospitals and health care facilities decide to go PVC free, they then use their market and buying power as leverage with vendors and group purchasing organizations. However, this decision is rarely made by cost considerations alone. For example, according to Sister Mary Ellen of Catholic Healthcare West, knowledge of PVC problems during manufacturing and incineration as well as the impact on patients led CHW to purposely try to "move the market in a different direction." Protagonists respond to successful diagnostic framing and prognoses that recommend environmentally preferable purchasing and working with (or pressuring) vendors, manufacturers, and GPOs as the solutions.

Members of the movement depict the development of PVC free production lines by manufacturers and the transition towards PVC alternatives by health care systems as a new market direction. Wally McCloud of B. Braun indicated that while B. Braun has produced a non-PVC/DEHP IV container for the last eighteen years or so, "it's only been within, I'd say, the past three or four years that the market has become more sensitive to

it from an environmental and patient safety standpoint.” As discussed in chapter three, some producers and health care providers may resist this change while others either become active in the movement themselves or alternatively adopt enough of the movement’s rhetoric to be perceived as positive contributors to the movement, while simultaneously capitalizing on their new ‘greenness.’ As Stacy Malkan points out, “sometimes the company sees the benefit of positioning themselves in the market as an environmental leader.” Manufacturers are not required to label their products, but as one person in the industry told me, “If it doesn’t say it’s free of it; it probably has it.” Labeling serves to both market and identify a company as part of an ‘environmentally friendly niche market,’ giving that company a competitive edge based on environmental performance.

This shift in the market is a major success for the movement. Four or five years ago when Ed McNeil, supervisor of a neonatal intensive care unit, wanted his NICU to switch to DEHP-free IV bags, not all manufacturers offered what he was looking for, nor cared about providing it for him. “Now,” McNeil says, “when manufacturers contact me with a new product, they send me a flyer and it always says, ‘DEHP free’ so they are certainly aware of it and pushing the issue now because they recognize that nurses have become aware of it and have become concerned about it.” On the downside however, concern and awareness of DEHP ironically risks overshadowing PVC concerns in some locales. Unlike DEHP, there is no FDA Public Health Notification regarding PVC. As Neha Patel told me, “DEHP is sort of a way to get the foot in the door to PVC, but doesn’t necessarily mean the hospitals are going to phase-out PVC as well.” Patel surmises that PVC’s ubiquity may be overwhelming for hospitals and thus not prioritized. However, because activists are able to influence the market, the market is perceived as the most effective avenue for attaining sustainability. As evidence, Patel points to the 2006 introduction of new PVC/DEHP free IV lines by Hospira and Baxter as market signals indicating a move away from PVC. In her view, the introduction of these lines “is a direct result of being asked and feeling the pressure from HCWH and also being asked from hospitals.” Indeed, the movement’s tactical emphasis on a market-driven campaign can be easily attributed to the documented number of success stories.

Market dynamics respond to the pressures of consumers. As Ed McNeil points out, “if you are a manufacturer of any product, unless you are really an exceptionally kind person, you just do whatever is cheapest unless somebody comes along and says, ‘that’s a problem.’” Similarly, Stacy Malkan states, “. . .I have hope that companies are going to start seeing more and more the obvious benefits of using environmentally safe materials. It’s just that it’s hard to get the market to change, unless they have to, unfortunately.” For Malkan, while she does see change as possible, the work is frustrating at times “and it often feels like one step forward and two steps back.”

Working within the system involves carefully treading when it comes to other businesses, even those who may be resistant to the movement. When asked whether Kaiser tries to inform their patients about environmental risks, Lynn Garske, Environmental Stewardship Manager for Kaiser Permanente, states, “For those that are clear-cut...absolutely.” However, she clarified, “. . .certainly we would never want to go out there and be liableness, be completely disrespectful of our business neighbors...” Garske recognized the international nature of environmental health concerns (i.e. bioaccumulative toxics don’t respect borders), but she also distanced the company from the relation to the problem, stating, “Of course, we don’t operate in any of those areas where PVC is actually manufactured, so this dioxin issue also seems to be far removed from where we actually operate.”

Outward Tactic (Government Relations)

Within the anti-PVC movement, interplay among movement participants, economic interests, and the state typically oscillates between regulatory disputes, building operative relationships, and at times even unanimity when the goals of movement activists are furthered rather than hindered by the actions of economic bodies and federal and state agencies. In chapter four, specific examples of contentiousness over government decision-making were provided to illustrate the sometimes conflictual relationship between movement participants and representatives of the state. However, ‘working within the system’ suggests that in addition to a tactical repertoire to hold the government accountable, at least some interactions with the state are nonconfrontational. Put otherwise, not all SMO/government relationships are antagonistic although they may

be contradictory at times. Given that prognostic framing activity often demands increased government involvement through regulatory or legislative processes, working *with*, rather than *against* government agencies is sometimes determined to be the most appropriate course of action.

The Oregon Center for Environmental Health's (OCEH) accomplishments are at times directly tied to cooperative interactions with government agencies and the state. After proposing a resolution to develop a toxics reduction strategy, OCEH then co-chaired a Toxics Reduction Workgroup for City of Portland and Multnomah County. Neha Patel elaborates on OCEH's efforts to build trust with government officials:

I would say it's been really quite positive [relationships with different government officials]. I think one thing, the Center has sort of positioned itself to be ...[is] an organization that can work with these different government entities and still be able to push them and hold them accountable. So, I think [it] varies...like within the City and County Project, I think that those relationships are really strong...building those relationships on the fact that the Center was a tremendous resource to the City and County as they moved through this process to develop the Strategy [Toxics Reduction Strategy] and there was this level of trust that was built.

Movement participants' relation to the problem is evinced by a strong influence on interactions with government agencies and expectations for government involvement. Whereas the advocacy, non-profit, environmental health organization Oregon Center for Environmental Health takes a proactive approach to shaping government actions and decision-making, other organizations, particularly those with economic interests connected with the PVC debates, take a much more laissez-faire approach. Speaking on behalf of Kaiser Permanente, Lynn Garske states,

We're typically not much in favor of greater regulation on any sort of industry. Believe that market powers can overcome and in partnering with others. We believe that through our purchasing practices and the distribution of information that we have and the communication that we have with our suppliers up the supply chain to the manufacturers, that the human health outcomes will become more widely known...

To a great extent, this position is reflective of their rejection of state intervention in the market, but likely to a lesser degree, this may also reflect a sort of self-protectionism given their status as one of the leaders in greening the industry. Should other health care systems be required to do what they already do, their 'green' advantage would dissipate.

Another industry interviewee indicated agreement with continued government

monitoring and receiving the funding needed to do so, although no mention was made of funding increases. This person maintained that government should also respond to constructive criticism, but asked, “How do you legislate? Add more red tape?” On the other hand, Joe Thornton, the former Greenpeace researcher, expressed strong support for government intervention. To quote Thornton at length:

I think it's imperative for the government to play a strong role...that the effort to stop global contamination and exposure by dioxin and other toxic products of the vinyl lifecycle has fallen to a few, small, non-governmental organizations who are trying to persuade building and hospitals to buy less vinyl is absurd. And the reason that it's fallen to them is because the government has more or less completely abdicated their responsibility to protect the public. So, what government ought to be doing is to be a very ambitious national program to eliminate sources of dioxin to the greatest extent feasible and it should be a long-term mandatory plan. But, obviously the reality, the political reality is that we're nowhere near that. There should also be [a] substantial tax on all products of chlorine chemistry, especially vinyl, to serve as a disincentive to their use. And, it could be used to help fund the transition away from those technologies to safer technologies as well. So, it should be both, sort of carrots and sticks. And government should be explicitly funding and encouraging the use of, funding the development of, and encouraging the use of alternatives.

Stacy Malkan affirms that HCWH will often work with the government, but this relationship does not prevent the organization from challenging different agencies on their findings, monitoring, or regulations. Malkan expressed similar frustration towards government (in)action:

And, one thing just about the government, I mean, in some ways it's just laughable some of the government responses, but the Consumer Products Safety Commission did a study on vinyl toys and the essential finding was that kids don't suck on toys long enough to matter. We call it the 'kids suck study.' They actually watched kids sucking on vinyl toys and decided, 'well, you know, 72 minutes or something like that would be the amount of time they would need to suck on that toy to get a high enough level to matter and they're not sucking on the toy that long.' It's absolutely illogical. It makes no sense. It's as we were talking about before. That same kid could be exposed to phthalates from the vinyl shower curtain, his mom's perfume, the car seat, and the toy that the Consumer Product Safety Commission is watching him suck on.

Malkan's comment underscores government shortcomings. The government's 'one-chemical-at-a-time' approach to chemical regulation translates into data for only 10 to 20 percent of the over 70,000 chemical in commerce (Fagin et al. 1999).⁹ This data

⁹ This number is now closer to 80,000, but I imagine the percentage of chemicals the National Toxicology Program has data on has changed little.

does not even begin to include information on the effect of chemicals in combination. Because of limited resources, and implicit (and explicit) protection of industry economic interests, government agencies rely on industry data, which as has been shown with vinyl chloride, lead, asbestosis, tobacco, and other hazards, prioritizes industry interests over public health. Thus, working in the system means that while SMOs such as HCWH generally do not overtly challenge the state's role as a protector of economic interests, the state is not exempt from contestation. However, demands for change occur using institutionalized channels.

In July 2007, HCWH was joined by six organizations; American Medical Association (AMA), American Nurses Association (ANA), American Public Health Association (APHA), Association of Women's Health, Obstetric and Neonatal Nurses (AWOHN), Physicians for Social Responsibility (PSR), and the American College of Nurse Midwives (ACNM) in submitting a formal petition to the U.S. Food and Drug Administration (FDA) to require labeling of all medical devices that may cause patient exposure to DEHP. This followed two previous petitions in 1999 and 2001. The earlier petitions preceded the FDA's 2002 Public Health Notification on DEHP in medical devices and were thus rejected under the presumption that the notification alone would address concerns. However, as these organization points out, the agency never issued a final guidance and never required medical device manufacturers to label products containing DEHP (Lewis 2007). Citing National Toxicology Program (NTP) studies that confirm the risks associated with human exposure to medical devices containing DEHP, HCWH contends that the NTP's findings "necessitate action under the Federal Food Drug and Cosmetic Act" (Lewis 2007:2).

The seven groups bridge the children's health frame with a diagnosis of government inaction. The prognosis is straightforward: require DEHP labeling on medical devices. As previously addressed, credibility lends strength to diagnostic and prognostic framing. Seven reputable environmental health organizations and medical associations provide greater legitimacy than any one organization petitioning the FDA alone. The organizations' deliberate politicizing of PVC led to an article in *USA Today* (August 15, 2007). While social movement actors rarely have control over how the

media present their claims (see Benford and Snow 2000), children's health and ethical framing have a strong chance of resonating with the public. In general, increasing media coverage helps draw attention to PVC concerns, thus potentially mobilizing constituents. Public attention to the politicization of PVC (and DEHP) also often leads to counterframing activity.

Inward Tactic (Education)

Education is a key component of the movement's tactical repertoire. Educational strategies serve to join movement protagonists in the framing process and to educate and recruit potential members. As mentioned, this occurs through encouraging the involvement of health care professionals, using listservs for discussion or providing expertise, publishing educational and guidance materials, and holding teleconferences and roundtables. Educational activities are often collaborative projects. HCWH partners with various organizations, sometimes providing mini-grants to make participation possible. Many written materials are directed at minimizing an array of environmental risks associated with the health care setting, including: incineration, mercury, cleaning products, DEHP leaching, and environmentally preferable purchasing. The Internet is used "as a valuable tool for improving communication, mobilization, and public relations" (Earl and Schussman 2003:157). Specifically, the Internet is employed as a means to disseminate information (sometimes rapidly), as a form of communication, means for calls to action or mobilization, to counter or respond to opponents, and as a public relations tool.

Education is largely directed internally and few resources are directed towards external development of public awareness. Even within the health care profession, movement members recognize that knowledge regarding PVC and DEHP issues varies significantly, in large part owing to one's geographical location. Some areas of the country, including California, Oregon, and Washington, are recognized or perceived as being more aware of PVC and DEHP related issues. However, members believe that awareness is growing substantially. Marian Condon first became involved in the movement in 2000 and observes that since then, the movement has "mushroomed...[with] a much bigger awareness among nurses—on all these

environmental health issues.” Condon credits ANA education initiatives with good success “in spreading the word.”

Educational efforts within health care have largely been directed at nurses, often by other nurses. Marian Condon states, “I think a lot of our efforts with PVC and DEHP have been with education, to educate the health care population about the hazards that they pose.” Movement adherents appeal to nurses’ sense of “first, do no harm” through ethical and children’s health framing. Nurses are targeted through articles and editorials in nursing journals, through their participation in the ANA, and through membership in the UAN.

The ANA’s Center for Occupational and Environmental Health, formerly the health and safety department, disseminates fairly extensive information on PVC health and environmental problems. Materials available from the Center include: research on neonatal exposure to DEHP leaching, the hazards of medical waste incineration and health care was more broadly, PVC-free alternatives for medical devices and other supplies, a guide for holding ‘green’ meetings, government environmental and occupational health data, information on nurses and healthy buildings, environmentally preferable purchasing, recommendations on how to become an advocate with links for becoming involved, examples of successful case studies, and other environmental health information and training for nurses.

Condon, a Senior Staff Specialist in the department, reports, “the ANA has kind of a tradition of supporting environmental health initiatives.” For example, ANA’s “RN No Harm” program is a “Train-the-Trainer” program designed to educate nurses about environmental health issues. Their Pollution Prevention Kit for Nurses “includes a model state regulation that nurses, working with lawmakers through their state nurses associations can use to help legislate strict standards on the release of dioxin in the environment” (<http://nursingworld.org>). The kit identifies basic, first steps that nurses can take to help make their hospitals more environmentally responsible). ANA also uses continuing education classes to reach nurses. A program called “ANA Coming to You” brings Continuing Education Units to the state organizations in order to share that information with their membership. Part of “ANA Coming to You” is an environmental

health segment that includes information on PVC and DEHP. Within the past year, the ANA has developed “Environmental Health Principles for Nurses” with the precautionary principle as an overriding theme. Some of these resources are no longer used regularly. However, through the Center for Occupational and Environmental Health and their collaboration with HCWH and other organizations, the ANA continues to educate and train RNs on PVC lifecycle concerns and the actions they can take address environmental health concerns in their workplaces.

Educational strategies are grounded in the reasoning that development of awareness does not necessarily equal action. Movement activists recognize the inadequacies of education without providing solutions. Neha Patel, Program Director of OCEH, states

...it was very clear that a lot of education needed to be done in terms of PVC and why it's harmful. I don't think there was real understanding...the Center feels education is really important. We also want to make sure there's some sort of action tied to that education. That we're not just telling them that PVC is bad, but trying to identify areas where they can make improvements and working with hospitals to do that.

Marian Condon expresses a similar sentiment, “...when you teach somebody about something, you always have to give them solutions too.”

Organizational structure may both facilitate and problematize dissemination of information. While large organizations often benefit from greater resources and economic or political strength, organization leaders must strategize to effectively educate their members. For example, the UAN, ANA, and IAFF hold yearly conventions attended by delegates representing different associations and locals; however, interviewees from all three groups recognized problems communicating a convention's findings back to members. As noted in the previous chapter, medical and health care organizations sometimes pass resolutions on PVC related concerns. Resolutions are discussed and passed at convention. The passing of resolutions is more than making a public statement. Delegates attend these conventions representing their local associations with the intent to distribute information to members. Ann Converso of UAN observes, “You are all inspired when you go to the convention and you're voting on resolutions, and how does that really get to the nurse on the night shift at 9-C at the Buffalo V.A. How do they know you did all this great work? It's a big challenge.”

The job of the IAFF Department of Occupational Health and Safety “is to make sure they [fire fighters] understand there are some very, very inherent dangers with this occupation – and how do we protect them.” Educating members is viewed as an important piece of that. The IAFF uses leadership and educational programs, such as the Affiliate Leadership Program or the Redmond Symposium, to educate local union presidents and members. At the and Redmond Symposium, specialists and experts from the U.S. and sometimes further, are brought in to provide members with up-to-date information on occupational health and hazards of the fire service. The IAFF also uses their magazine, website, and DVDs to educate their membership. These materials emphasize that PVC does not need to burn for fumes and gases to be released and note that the PVC’s chlorine content may actually prevent the ignition of PVC.

Type III Contested Illness

The fourth characteristic of a PIHM concerns how activists address contested illnesses. In PIHMs, movement protagonists address type three contested illnesses—those illnesses with diffuse or hard to establish causes. As described in chapter two, in the third type of contested illnesses, a link may be recognized between environmental or occupational exposure and a health risk, but the degree (or even *if*) that exposure leads to harm is greatly contested. Put otherwise, the environmental source of the health problem is a known toxic, as in the case of vinyl chloride, dioxin, or DEHP, but disputes arise because a scientific link has not been definitively established (or if so, the degree that it is harmful remains contested), and/or because of the difficulty in attributing the health problem or illness to a specific toxic source. Contested illnesses are marked by scientific uncertainty and should be understood to include a range of health problems or conditions that are environmentally induced that meet the above criteria. Brown, Kroll-Smith, and Gunter (2000) observe that environmentally and occupationally-induced illnesses and health problems become disputed in large part because they “are often linked to the production and consumption practices of modern societies” (p. 9).

Industry relies on scientific uncertainty to argue that a problematic claim of opponents does not exist. This creates challenges for movement members as they try to bring attention to contested health problems. Health care activists must simultaneously

convince others there is a problem and at the same time be careful not to advocate for alternatives that are equally, or even more risky. With PVC and DEHP, advocates must frame their concerns in such a way as to deflect from the role health care has played in contributing to PVC related hazards. Generally, medicine plays the most significant role in legitimating contested illness. However, in type three contested illnesses, because of the involvement of health care activists in PVC politicization, legitimation of the illness has become more complicated. The state and other decision-making bodies rise to play a greater role in the outcomes of PVC disputes. In particular, interviewees commented on the significance of the FDA Public Health Notification regarding the vulnerability of special patient populations to DEHP exposure from PVC medical devices. The decisions made by the International Joint Commission, the World Health Organization's International Agency for Research on Cancer DEHP Workgroup, the state of California (i.e., Proposition 65), and international regulatory bodies also proved to contribute to the contentious nature of the debates. For some health care professionals, they provided an 'authoritative voice' that legitimized the objectives and actions of movement protagonists.

Illnesses are often contested due to a dearth of data. This is not the case with PVC and DEHP related health problems. Vinyl chloride monomer is one of the best-studied chemicals and DEHP toxicity has been well researched for over two decades (Kielhorn et al. 2000; Tickner et al. 2000). According to Frederick S. vom Saal (2007), Professor of Reproductive Biology at the University of Missouri-Columbia, 153 of 167 government-funded studies have found exposure to phthalates harmful, while 13 of those studies that have concluded that phthalates are not harmful were produced by chemical companies (Filteau 2007). Vom Saal argues that industry then uses those studies for "the creation of scientific uncertainty" to stave off regulation. Or as vom Saal (2007) notes and Mirer (2003) notes, industry produces and publishes research that supports their interests.

Fagin et al. (1999) contend that as the number of chemicals on the market has risen the approach of the National Toxicology Program has been "to look deeper and deeper into the chemicals it already has identified as hazardous" rather than investigate

new ones (p. 70). A greater amount of research does not translate into increased public safety. In fact, movement protagonists might argue that for PVC and DEHP the opposite seems to be true: the more data that is generated, the greater the opportunities for countermobilization by the plastics and chemical industries. Industry points to inconsistencies in the data or uses the argument that the ‘jury is still out’ or the ‘chemical still under review’ saying that the chemical has been so well studied with no definitive conclusions, that clearly the chemical is safe.

Movement adherents’ construction of PVC and DEHP as an environmental and human health problem corresponds with what Krimsky (2000) terms a ‘public hypothesis.’ In Krimsky’s (2000) examination of the scientific and social origins of the environmental endocrine hypothesis he seeks to understand the process by which the scientific hypothesis of endocrine disrupters moved into a stage of public debate. Krimsky (2000) uses the term ‘public hypothesis’ to describe this “stage in the development of a scientific hypothesis during which segments of the public feel they have a stake in the outcome of the scientific debates and therefore make increasing demands in order to establish a clearer understanding of the conflicting views” (p. 56). While, not all anti-PVC activists are interested in participating in the construction of scientific hypotheses regarding health problems associated with PVC, scientific arguments nonetheless underlie much of PVC’s politicization. This is a particularly accurate description of the contentiousness surrounding DEHP in PVC medical devices. Krimsky’s (2000) idea of a “public hypothesis” can be extended to emphasize the social or political demands (or debates) made by different segments of the public in shaping a scientific issue.

It seems, however, that the development of a ‘public hypothesis’ would necessarily mean *all* stakeholders, including representatives of the plastics and chemical industries are free to shape the hypothesis. Indeed, with regard to the environmental endocrine hypothesis, Krimsky (2000) found, “Industry...began emphasizing the importance of ‘good science,’ citing uncertainty, the ambiguity of results, confounding variable, and the need for more research” (p. 112). If there is no ‘authority’ or agent in control of the process, then the result may be a ‘scientific’ framing contest whereby

different stakeholders present their varying interpretations of existing data and/or conduct research in order to define the hypothesis. Industry will want to participate in the development of a ‘public hypothesis’ so long as this scientific uncertainty remains. As vom Saal (2007) pointed out, this is a stalling tactic intended to delay any meaningful regulation. Industry does not actually push for the construction of a public hypothesis; that would bring unwanted attention. But as long as the environmental and health effects of PVC’s impact are considered hypotheses, industry is able to use the framing process to shape public debate. Industry does not need to be explicit about this. Industry front groups—such as the Nurses Leadership Council, an ‘independent’ body of nurses scholars sponsored by the Chlorine Chemistry Council, or the Environmental Health Research Foundation, a chemical and plastics industry funded research foundation emphasizing ‘sound science,’ and hired to respond to CHEJ’s *Behind Closed Doors* report—serve to veil many of the tactics the chemical industry uses to protect their interests. On the other hand, movement adherents tend to avoid engaging in scientific framing contests with pro-PVC supporters, in large part for the reasons described above. While organizations such as HCWH retain scientific advisors and produce and publish scientific reports, they do not necessarily argue for the generation of more data. Instead, they maintain the evidence is strong enough to warrant a precautionary approach in deselecting PVC.

In 1996, the publication of *Our Stolen Future* helped normalize the contested nature of some environmentally-induced health problems, raising “a serious obstacle for the scientific method, namely insurmountable barriers to the discovery of the cause of chemically induced disease” (Krimsky 2000:131). Authors Theo Colborn, Dianne Dumanoski, and John Peterson Myers (1996) argued that the thousands of pesticides and industrial chemicals that have been released into the environment over the past 50 years have wreaked havoc with the hormone systems of humans and other animals. These endocrine disruptors mimic natural hormones such as estrogen or inhibit the action of those hormones. *Our Stolen Future* and the work of Colburn more generally has contributed significantly to the debates surrounding contested environmentally-induced health problems and illnesses where opponents or critics outright dismiss concerns

asserting a lack of scientific evidence for human effects. In a 1996 review in *Environmental Building News*, the journal pointed to *Our Stolen Future*'s implications for PVC politicization, observing "the book, and the future research that it will surely inspire, could have a dramatic impact on manufacturing, including the manufacture of building materials such as PVC" (EBN 1996). *Our Stolen Future* was instrumental in challenging long-held assumptions of toxicity determination and broadening the scope of chemical concerns beyond carcinogenicity.

PVC's hazardous lifecycle means that each stage is associated with a different set of health conditions and problems and all of these are open to contestation. For example, within the past year, the debate over chlorine spilled over into the generally polite and restrained H2E listserv. A doctoral student working in Mexico emailed the listserv for suggestions for healthier alternatives to sodium hypochlorite (bleach). The first response came from a frequent participant asking, "When did bleach become unsafe?" This question generated a short burst of emails on the safety of bleach, ranging from a selection of articles sent on why the chlorine industry is deadly, to concerns about chlorine being highly caustic and a respiratory irritant, concerns about the manufacture of bleach using the mercury cell process (this use of this process is in decline, however, when the process is used, bleach is contaminated with mercury) to pointing out that "people tend to take the most commonly used chemicals for granted."

Describing the difficulty in linking health problems with PVC, Alicia Dunn (pseudonym), a medical supplies company pharmacist, points to the lengthy time delay from exposure to the time of health impacts. Dunn likens PVC and DEHP exposure to cigarettes; for years, smoking was not considered harmful. And, similar to cigarette smoking, the distance from one's first cigarette to disease, or the distance between PVC/DEHP exposure and illness is elusive to prove. Medicine as a whole relies on evidence and as more evidence emerges, Dunn predicts more of the health care industry will be influenced to change. However, these challenges are exacerbated by the difficulty in obtaining this evidence. A double-blind clinical trial—exposing some neonates to PVC/DEHP free IV bags and not others—followed by testing 10 to 15 years later would be difficult to conduct with neonates. Small sample sizes could further complicate

proving unequivocal links. Dunn cautions that conclusive results would be tricky to obtain from this data. In comparison, she points out that pharmaceutical manufacturers use a much shorter time frame for testing specific drugs; “essentially, here we give you this drug and then measure the results a few weeks later.” With DEHP, this is not the case and the data “trickles out.”

Dunn makes the point—the hallmark of contested environmental problems—that filtering out the cause of a particular health problem is very difficult to do. As a trained pharmacist, she expresses concern with replacing PVC with something potentially more problematic, asking, “What is the necessary level of exposure? What’s the magic number that you need to show an effect? Whether it is a positive, negative or neutral effect/no effect, finding that number is hard. Do you take it [DEHP] out of the whole population even if it is only harmful for with a certain population?” Her comments underscore the challenges that scientific uncertainty presents for politicizing PVC. For many movement participants, they propose employing a precautionary approach to address these concerns.

References to a precautionary approach are commonly used in regard to the Wingspread Statement on the Precautionary Principle, which states, “Where an activity raises threats of harm to the environment or human health, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically” (Myers 2006:1).¹⁰ The principle runs counter to risk assessment models, which are regarded by activists as failing to adequately protect public health. According to Neha Patel, program director for the Oregon Center for Environmental Health, “Our mission I think flows directly out of the precautionary principle. It’s the common thread in all of our different efforts and programs.”

The primary goal of the movement is not to convince the vinyl and chemical industries to change behavior, although that would be a welcomed outcome, but rather the goal is to work within the system to educate health care professionals and to transform the market. Industry may respond to changing market demands, but this

¹⁰ The Wingspread Statement is the most familiar definition of the precautionary principle. It emerged from a small conference in 1998 at Wingspread, the Johnson Foundation’s conference center in Racine, Wisconsin (Myers 2006).

reflects the movement success with consumers of PVC (i.e. hospitals) rather than indicating direct engagement with industry. The politicization of PVC is not a theoretical or epistemological debate about PVC's safety within health care; its approach is much more action oriented. Movement protagonists seek to change the health care industry and the market rather than persuade the vinyl and chemical industries that PVC is harmful. The PIHM is also different from other health social movements or embodied health movements, which tend to focus on illness construction, and are marked by lay-experts seeking to democratize the production and dissemination of scientific knowledge (see Morello-Frosch et al. 2006; Hess 2004).

¹¹ The Wingspread Statement is the most familiar definition of the precautionary principle. It emerged from a small conference in 1998 at Wingspread, the Johnson Foundation's conference center in Racine, Wisconsin (Myers 2006).

CHAPTER VI

BUILDING POLITICAL OPPOSITION TO PVC: THE U.S. GREEN BUILDING COUNCIL AND BEYOND

...well, to me, it's sort of a no brainer that if you are going to have a green building, you can't have vinyl in it.

Joe Thornton (interview)

...the future of green building does not hinge on what happens to PVC. If everybody's hopes are riding on PVC, 'once we get rid of it we will really be green,' well, they are just smoking something. They're not going to get green buildings, you are not going to improve, you are not going to save energy and water resources and minimize your footprint or anything like that by switching out of PVC. And in fact, you could, to some extent, you could have a worse footprint..."

Leading vinyl industry representative (interview)

It is much better to focus on materials that we know are safe, instead of using each other and the planet as trial subjects.

Jason McLennan, green building pioneer, U.S. Green Building Council Cascadia Region Chapter President, and author of *The Philosophy of Sustainable Design*.

Approximately 75% of all PVC manufactured is used in construction materials. PVC construction and building materials include: siding, flooring, fencing, roofing membranes, piping, windows, carpets, wallpaper backing, and conduit and installation. Phthalates, including DEHP, are also used as plasticizers in flexible PVC building materials. Among stakeholders in the green building industry, contentiousness arises over whether vinyl can ever be considered 'green.' Controversy over the use of PVC in construction emerged most predominately in response to a 1999 recommendation within the United States Green Building Council (USGBC) to give credit to projects avoiding PVC through the organization's green rating system. This debate has continued for over seven years, as the USGBC has solicited comments from stakeholders and scientifically reviewed data on the environmental and health risks of PVC. The Healthy Building

Network (HBN), the USGBC, and the Vinyl Institute are the major stakeholders in these disputes, although there is also involvement from many of the same organizations concerned about PVC's use in health care. In this chapter I provide an overview of the history of green building and the U.S. Green Building Council and examine the politicization of PVC's use in green building. I also examine how activists frame their concerns and strategize to reduce PVC's use outside of the USGBC. In the final section of the chapter I examine green building beyond the USGBC. In 2006, *The Green Guide* ranked the Eugene, Oregon as the number one green city from among major metropolitan areas nationwide (EWEB 2007). For this reason, special attention is given to green builders in Eugene throughout this chapter.

U.S. Green Building History

Activism among builders likely began in what Jason McLennan (2004) calls the “modern sustainable design movement” (p. 27). McLennan, a pioneer in the green building movement and the CEO of the Cascadia chapter of the U.S. Green Building Council, regards sustainable design as a sub-set of the modern environmental movement. According to McLennan, sustainable design is “the building industry’s reaction to the realization that *how* it does business is a large contributor to the environmental problems we face today” (p. 27, emphasis in original). His book, *The Philosophy of Sustainable Design* provides an insider’s view of the development of the movement within the building industry. The origins of the movement can be traced to the energy crisis of the 1970s, which fostered a shift in architectural design towards reduced energy consumption and cost efficiency. This period was marked by alternative energy and waste technologies experimentation among architects and designers.¹ However, as oil prices declined, the movement toward sustainability suffered. A negative public perception formed around those early designs, hurting the movement for the next twenty years.

Little progress occurred in the 1980s in the sustainable or green building movement, although the movement did not completely disappear from existence. As McLennan (2004) describes, “Those who would be the most committed to the ideas of sustainable design continued to practice...while others disappeared into the rank and file

¹ In fact, at this time the movement was actually called Energy Conserving Design (McLennan 2004:29).

of the professions ignoring the lessons they briefly flirted with” (p. 29). Architects responded to the consumptive culture of the decade, where “green was no longer cool” and energy and environmental concerns in building were largely abandoned (McClelland 2004:29-30). Moreover, the energy saving buildings of the 1970s were found to contribute to the phenomena now known as ‘sick building syndrome.’ As McLennan (2004) describes, “these buildings were designed with very tight envelopes and had reduced air changes, causing build ups of carbon dioxide and indoor pollutants from off-gassing of interior finishes and furnishings” (p. 30). By the mid-1990s, the backlash to green building seemed to have faded. Green practitioners had begun to incorporate a wider range of concerns in their building designs than they had in the 1970s, including human health and indoor air quality.

During the mid-1990s, greater consideration of building features and impacts, such as material selection, resource conservation, human health, and productivity began to occur by a larger segment of architects (McClelland 2004). In 1992, there were only a small handful of green building consulting firms in the U.S. when David Gottfried, founder of USGBC, convinced the company that he was working for to start an environmental consulting firm (Gottfried 2004). Green building was not yet a familiar term, even to environmental organizations. Gottfried worried because there were hardly any drafting standards on green building, so he was told to “just invent it” (Gottfried 2004:66). Gottfried became chair of a new American Society of Testing and Materials (ASTM) subcommittee on green building. The subcommittee used a consensus-based decision-making model, an approach he would later bring to the USGBC. Gottfried and his colleague Mike Italiano had a vision of engineers, builders, landscape architects, interior designers, academics, industry representations as well as architects coming together. They believed inclusiveness was vital to the movement, a fact that McLennan (2004) regards as “one of the most significant moves in advancing the building industry towards sustainability” (p. 31).

United States Green Building Council

The building industry was slow to become engaged with the environmental movement. There are several factors that account for this reluctance: the conservative

nature of the National Association of Home Builders, concern over backlash from 1970s energy efficiency efforts that led to increased indoor toxicity, and a growth-driven building market. While the United States lagged behind, England had already developed and begun instituting BREEAM (Building Research Establishment Environmental Assessment Method), their version of a green building rating system. By 1993, Gottfried and Italiano were ready to officially launch the U.S. Green Building Council. Whereas interest in sustainable design and construction languished in the 1980s, the 1990s were marked by growth in green building conferences and the number of green building practitioners. An increase in USGBC membership numbers and importance accompanied the progression of the green building industry. However, the evolution of the USGBC has not been without conflict. In this section, I introduce the major and interrelated controversies that have occurred within the organization. These disputes include the admission of trade associations to the organization and consideration of a PVC avoidance credit in the USGBC green rating system. I use political opportunity theory and a consensus-based decision-making model to detail how the formation of the USGBC has helped set the stage for the current debates around PVC.

The U.S. Green Building Council describes itself as “a community of more than 11,000 organizations from every sector of the building industry united by a common purpose: to transform the building marketplace to sustainability” (www.usgbc.org). This description varies slightly from an older explanation previously on their website indicating that they were “the nation’s foremost coalition of leaders from every sector of the building industry.... united to advance our mission of transforming the building industry to sustainability” (www.usgbc.org). This slight change reframes the USGBC image to be more inclusive (i.e. ‘a community of organizations’ versus ‘national leaders’), while refining their objective of transforming the ‘building industry’ to transforming the ‘building *marketplace*.’ This latter change underscores the anti-PVC movement’s emphasis on market change over political or social change.

Nevertheless, such self-assurance as “the nation’s foremost coalition” was not unfounded. In July 2007, the USGBC welcomed its 10,000th member company, by September 2007 that number had grown to over 11,000 member organizations. The

USGBC green rating system, the Leadership in Energy and Environmental Design or LEED, is generally regarded as the preeminent authority on ‘design, construction, and operation’ of green buildings. There are almost 40,000 LEED-accredited professionals, another 56,000 professionals have attended LEED workshops and over 13,000 people attended Greenbuild, USGBC’s flagship conference, in 2006.² Since 2000, USGBC has experienced a ten-fold increase in membership. There are LEED projects in all fifty states and forty-one countries totaling over 4 billion square feet in the commercial marketplace (www.usgbc.org). While LEED is not the only existing rating system nationally or internationally, according to Michelle Moore, Vice President, Communications and Community, LEED’s distinction lies in part to its devotion to a consensus process.³ This consensus-based decision-making model allows for input from both members as well as interested public stakeholders. The consensus model of the USGBC makes the organization susceptible to challenges from both within (by members) and without (public input). In other words, this approach contributes to the inclusion of feedback from a diversity of stakeholders but also creates the potential for intra and inter-organizational conflict whenever a particularly contentious issue, such as PVC, emerges. The significance of a consensus-based decision making model will be discussed further in the pages that follow.

The USGBC and Political Opportunity

Many social movement scholars regard political opportunity as a condition for conduciveness and movement mobilization (see McAdam and Snow 1997; Tarrow 1994). Tarrow (1994) defines political opportunity structure as the “consistent—but not necessarily formal or permanent or national—dimensions of the political environment which either encourage or discourage people from using collective action [emphasizing] resources *external* to the group” (p. 18, emphasis in original). Traditional political opportunity models are based on the premise that the state is the subject of politicization.

² In a display of the USGBC’s growing preeminence, former President Bill Clinton is scheduled to deliver the Keynote Opening Plenary of Greenbuild in 2007.

³ Other rating systems are heavy on trade association involvement, including Green Globes and more internationally based rating systems, such as GBTool, Building Research Establishment’s Environmental Assessment Method (BREEAM), and Comprehensive Assessment System for Building Environmental Efficiency (CASBEE).

However, in the case of green building, the USGBC often serves as the de facto policy maker when it comes to green building, with government entities even turning to the organization as the source for guidance and knowledge on green building. By and large, government standards that regulate or certify green buildings originated within the USGBC. In the U.S., LEED initiatives can be found in ninety municipalities, twenty-four states, and twelve federal agencies. San Francisco is the largest city requiring private commercial construction projects over 5,000 square feet to meet LEED standards. Almost 4.5% of LEED certified buildings are owned by the federal government. In 2006, the General Services Administration (GSA), which operates as the federal government's landlord, endorsed LEED as the most credible green building ranking system (Inside Green Business 2006).

From the beginning, the founders of the USGBC sought to develop green building standards for adoption by the American Society of Testing and Materials (ASTM). As Gottfried (2004) explains, "ASTM standards for building products were cited in building codes, governmental regulations, and laws, as well as specified by architects in their building plans" (p. 63).⁴ By 2006, the American National Standards Institute (ANSI) accredited the USGBC as an official Standards Developing Organization for standards relating to green building practices.⁵ As Bill Walsh, an activist in the green building movement explained to me in an interview:

The USGBC operates a lot, much of the same way as a lot of code setting organizations for the building industry. And the way building codes get developed is professional agencies, professional societies I should say. It's developed the standards for the profession, for plumbing or for electric or for construction – and what typically happens is that local jurisdictions incorporate those standards by reference into their own laws. So what are called local building codes are kind of based on a common platform and they are not thought through by each individual town or county or state. And so the USGBC has kind of structured itself in a similar way where it will develop kind of template building standards and we are seeing increasingly that the states or federal agencies for example decide they want to do green building, they simply incorporate these standards into their laws, sometimes with modification, sometimes without. So it becomes kind of a proxy for legislation or for legally binding standards – these professional standards getting developed at the USGBC.

⁴ ASTM is now ASTM International.

⁵ ANSI is a national standards body, whereas ASTM is international.

Thus, within green building movement, the decisions of the USGBC often both reflect and shape the political and legal environment.

The USGBC has a highly influential and instrumental role in the green building movement. Prominent green builder, Jason McLennan (2004) contends, “Perhaps no other organization in the United States has done as much to create positive change in the sustainable design world as the U.S. Green Building Council” (p. 141). However, the USGBC’s role in the anti-PVC movement is a bit murkier. As mentioned, the USGBC is comprised of over 11,000 member organizations, representing a diverse constituency of interests in the building community. As an organization, the USGBC is at times within the movement and supported by movement stakeholders, but because of its influence in shaping what is considered green building or green materials, is also at times challenged by these same organizations and activists. Thus, the USGBC holds the unique position of being both part of and a target of the same movement.

Trade Associations and the USGBC

Tarrow (1994) contends that political opportunities arise from the opening up of access to power (p. 19). In 2005, the USGBC Board of Directors unanimously voted to allow trade associations to become members of the organization, reversing its own bylaws and a ‘no’ vote from the year before on the same question (Walsh 2005a). This controversial decision was seen by some as a direct response “to the politics of the controversy around the vinyl credit,” and specifically attributable to the Vinyl Institute and other trade associations “joining and muscling and throwing their weight around within the Green Building Council” (interview, Thornton). However, in my interview with Michelle Moore, Vice President, Communications and Community, Moore stated that the USGBC founders initially excluded trade associations because the organization was “new and small [and] we wanted to engage their member companies directly.” And, in fact, Moore adds, they did not want to have the USGBC become “a political body.” In its formative years, the USGBC had an as yet untested level of efficacy. As the USGBC has grown larger and increasingly more powerful, its susceptibility to pressure has been tested more frequently and intensely.

At variance with Moore's understanding, autonomy concerns were only one factor in this decision. In truth, the original decision to bar trade associations may have rested much more significantly with financial concerns. In its early years, the USGBC struggled to secure funding and dues paying members (Gottfried 2004). Early membership plans centered on raising capital and included only organizations, avoiding individual memberships specifically because they did not want to be like other organizations where individuals paid lower dues, "yet required the same level of service in terms of mailing costs, staff time, and meeting costs..." (p. 116). Overall, the decision to include or not include trade associations did not seem to weigh heavily on the founders' minds, although they did express some ideological concerns. They worried that too many trade associations would kill "the pioneering spirit that our [the USGBC's] visionary and progressive corporate members stood for" (p. 108). Perhaps more significantly, they expressed concern about trade associations lobbying "to influence legislators in favor of special interests" (p. 122). However, an explicit decision to bar trade associations was only made when two unsolicited trade associations attempted to join by sending in membership checks. USGBC's founder David Gottfried writes in *Greed to Green*, his autobiography of those formative years, that he and co-founder, Mike Italiano returned the two checks fearing that if trade associations joined, the USGBC would never be able to recruit any of their members (p. 122).

The desire of trade associations to become members of the USGBC speaks to the importance this organization plays in the green building movement. Opponents argued against trade associations joining because their member companies already had membership rights. This amounted to "double-dipping" with trade association memberships allowing "manufacturers having a financial stake in how their products fare under LEED to manipulate the system, operating under multiple aliases" (Walsh 2004). Bill Walsh, National Coordinator of the Healthy Building Network, former Greenpeace staff member and consultant, and one of the most vocal critics of the USGBC's decision argued that this decision enables manufacturing members to market themselves as green while their trade associations do all the dirty work (Walsh 2004). The USGBC ultimately disagreed, asserting that as a consensus based organization, all parties representing the

market, even those “diametrically opposed and [with] competitive interests” must be brought to the table (Walsh 2005d). In an interview with Rick Fedrizzi, USGBC President, CEO, and founding chairman, Fedrizzi agreed with Walsh that trade associations have always had access to the USGBC through their members and that there will be some overlap but it “will be transparent to members” (Walsh 2005a). Fedrizzi acknowledged the exclusion of trade associations had:

Become like a small tear in the fabric of our core values that some of our critics were using to distract us from our mission of market transformation towards sustainability. The federal government is an important customer for us, and they began to question the exclusion as well. These concerns are now removed (Walsh 2005a).

Ironically, Fedrizzi seems to be implying that having bowed to the pressure of outside forces to let trade associations in, that pressure will now dissipate, rather than build. For trade associations, the desire to be a member of the organization was not simply about being ‘one of the club,’ but to participate in the organizational process and decision-making, thus establishing greater opportunity to legitimately challenge USGBC’s policies.

Alex Wilson, a two-term member of the USGBC Board of Directors, and Executive Editor of the *Environmental Building News*, reflected on his years with the USGBC in the journal in 2006:

Without question, the most challenging issue we addressed as a board—an issue we addressed over and over during several years—was the question of whether trade associations should be able to join the Council. There were two very good sides to this debate, and, at different times, I found myself on alternate sides—ultimately agreeing with other board members that trade associations should be included (Wilson 2006).

While Wilson (2006) believes that the USGBC will “stay true to its mission” he recognizes that the inclusion of trade associations may sway board elections and “usher in a new period of trade association influence” (Wilson 2006). Since the decision to allow trade associations to join the USGBC, over 40 have done so, including the Vinyl Institute and the American Plastics Council.

Consensus-Based Decision-Making

The USGBC’s decision to include trade associations exemplifies use of the collective action tactic of Consensus-Based Decision-Making (CBDM) (Pellow 1999). CBDM “is a ‘participative’ model of policy-making . . . where each actor is theorized to

negotiate in ways that lead to win-win situations” (Pellow 1999:660). CBDM is intended to address unequal power relationships inherent within social movements. In CBDM, actors collaborate with one another and are thus viewed as stakeholders rather than opponents. As the USGBC explains, the organization employs CBDM “from across an extremely diverse membership” (www.usgbc.org). While CBDM does not contend that conflict is eradicated, this approach assumes that there is some common ground to be found among the multitude of stakeholders. As an example, when I asked Moore about the USGBC’s experiences with resistance, she indicated that as recently as two years ago, some in the industry mistakenly believed green building costs were significantly higher. But now, she maintains a lot of those groups have gotten on board and begun participating. As Moore sees it: “...it’s a win-win for everybody so you don’t really see any resistance.”

Consensus-based decision-making has been central to the USGBC since its inception. Gottfried and Italiano’s experience at the ASTM had convinced them “that a lot more is accomplished by working together rather than suing each other” (Gottfried 2004: 100). Ironically however, as chair of a newly formed ASTM subcommittee on green building, Gottfried’s first primary experiences with CBDM revealed the potential for industry pressure in such a setting. In the process of drafting green building standards, he grew frustrated with three committee members who kept insisting that smoking be allowed in buildings if a room’s ventilation was separately ducted. He later learned from an investigative article in the Washington Post that the Tobacco Institute funded those committee members. Gottfried (2004) realized, “They had unlimited funds to fight me, as did some of the large product manufacturers who wanted to slow us down, fearing that the standard would hurt their business” (p. 67). His drafted standards were also criticized by “a member from a major manufacturing firm who said that the information I’d written was ‘anecdotal’ and needed hard statistics. I agreed, but the data he wanted simply didn’t exist” (p. 3). Similar complaints have resurfaced in PVC LEED

debates by representatives of the building trades, and vinyl, plastics, and chemical industries.⁶

It is unclear from *Greed to Green* and other accounts whether the intent of the decision to allow trade associations to become members was a sincere desire to incorporate the valued contributions of industry groups or as a mechanism for controlling conflict with environmental groups. USGBC founders intentionally sought out middle of the road environmental organizations who “unlike those to the far left, these organizations understood the value of working with manufacturers, even firms that produced toxic products or were on the EPA’s Superfund cleanup list” (Gottfried 1994:107). By 1994, only three environmental organizations were on board (Natural Resources Defense Council, Rocky Mountain Institute, and the National Audubon Society). The representative for the National Audubon Society left the organization in anger, claiming, “None of these folks here are environmentalists; they’re just a front for the industry” (Gottfried 2004:128). Indeed, among some in the building committee, the newly formed organization was regarded as a “greenwasher.”⁷

Use of CBDM raises several questions. If compromise is inherent in consensus-based decision-making, has the goal of activists, in this case the avoidance of PVC in green building, been sidestepped in order to benchmark ‘a success’ rather than actually achieve success? This seems particularly relevant when environmental and public health concerns are at stake. Should the USGBC ultimately decide to accept limited use of PVC, is the release of only ‘some’ dioxin acceptable? In other words, does the use of CBDM actually result in a more favorable outcome for PVC opponents and environmental and human health? By including trade associations in decision-making, will the result be less ‘green’ buildings? In the case of USGBC, is the use of CBDM a way to avoid conflict rather than eliminate conflict? Consensus is more easily achieved

⁶ Early on, dissent within the Council rose in response to co-founder Italiano’s proposal for either a pollution tax on certain building products or a tax break for those that were more environmentally friendly. A committee was formed to investigate how this might work for the building industry, however the majority of the Council’s members were against it, “it’s just too early for us to study this” and the idea never left committee (Gottfried 2004: 125-129).

⁷ As an aside, in *Greed to Green*, Gottfried does not write at all about the standards they used to determine ‘how’ environmentally friendly a product was, just that it was ‘environmental.’

when the starting points among stakeholders are structured to be fairly close together and at least some of the groups are willing to shift positions rather easily. In other words, even though consensus has been stated to be a core value of the USGBC, from the beginning the founders did not regard working with more radical environmental groups to be worthwhile; thus, by reaching out to only moderate environmental groups, consensus never moves very far from the middle. Instead, conflict seems to spill out into other areas of the movement. Moreover, while the goal of CBDM is to include all stakeholders, this goal isn't realistically possible. CBDM may intend to neutralize power differences, but as Pellow (1999) recognizes, "Business interests' involvement in politics affords them systemic power, whereas social movements can only hope for periodic access to policymakers" (p. 666). It is impossible to ignore the dynamics of the political economy. As Gould, Pellow, and Schnaiberg (2004) write elsewhere, "these social forces [environmental, antitoxics, and environmental justice movements] were (and remain) at a major power disadvantage vis-à-vis political and economic elites" (p. 300).

According to my interview with Michelle Moore of the USGBC, trade associations have been "engaged with the USGBC for a little more than two years...with...no bumpy results." This contrasts with the perceptions of PVC opponents who express uncertainty about the degree to which trade associations, particularly the Vinyl Institute, have been able to direct USGBC policy. Through the framing process, different stakeholders struggle to promote particular "realities." The USGBC's objective is to create an impression of minimal conflict among stakeholders. Whereas, movement protagonists' diagnostic framing attributes undue industry influence to the inclusion and pressure of trade associations in the decision-making process, the USGBC rejects the prognosis to exclude their participation. To do otherwise would undermine the perceived efficacy of the consensus based decision process in transforming the building marketplace. Movement protagonists call attention to the shortcomings in CBDM for failing to account for different levels of power among stakeholders. They argue that industry influence weakens the USGBC, detracts from the organization's core values, and impedes the green building movement's forward progression.

The vinyl industry has been both critical and supportive of the USGBC. When the USGBC Board of Directors initially voted not to allow trade associations to join the organization, the Vinyl Institute and thirty-four other industry associations responded by forming the North American Coalition on Green Building.⁸ Through this counter response, the Coalition attempted to reframe the USGBC and their green rating system as “neither consensus-based, nor grounded in objective, scientific criteria” (NACGB 2005). Thus, while casting doubt on the USGBC’s credibility, the Coalition framed their own organization as willing to “work with all interested parties to promote green building concepts and standards that reflect the views and concerns of all stakeholders” (NACGB 2005, emphasis in original). The Vinyl Institute is also a supporter of the Green Building Initiative’s “Green Globes” system, an alternative green rating to the USGBC’s LEED standards. Debates surrounding other rating systems are discussed below.

Leadership in Energy and Environmental Design (LEED)

The LEED rating system is the primary and most tangible way the USGBC influences green building. While media coverage and education of the building community has helped promote and familiarize both the public and professionals within the industry, LEED certification is widely recognized as the most credible method to market or present a building as green. Inside Green Business (2006) reports, LEED emerges “as the most important force in the accelerating market for green buildings.” According to the USGBC, “LEED provides a roadmap for measuring and documenting success for every building type and phase of a building lifecycle” (www.usgbc.org). Originally designed for commercial office buildings, LEED has expanded to include other building types such as LEED for Retail and LEED for Schools. With the assistance of others in the movement, the USGBC is currently developing a LEED for healthcare. There are five LEED categories: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality. LEED is based on a

⁸ While the majority of these associations represent various interests in the wood products industries, members also include plastics, formaldehyde, sealants, and paints associations.

point rating system with four levels of certification—LEED certified, LEED silver, LEED gold, and LEED platinum—depending on the number of points accumulated.

LEED, PVC, and Controversy

In late 1999, members of the LEED for Commercial Interiors Committee began discussing a materials credit for PVC avoidance. Under draft language, PVC avoidance was categorized under “Materials Credit 9, Alternative Materials” with the intent to “reduce use of product containing toxic and/or hazardous substances and encourage use of comparable alternatives” (LEED Commercial Interiors 2000:17). In part, this required elimination of “the use of virgin PVC and all chlorinated plastic compounds” (p. 17). According to Michelle Moore, the proposed credit language was presented to the LEED Steering Committee as is the standard process. As Moore described, in the first step of the USGBC’s consensus based decision making, the LEED Steering Committee receives a proposal. The Committee then sends the proposal out for a public comment period. If there are no substantive changes, the credit language is released for membership ballots. If there are substantive comments, the proposal is revised and public comment is sought again. Until the PVC issue emerged, all LEED credit proposals had followed the same consensus-based decision making process. However, in this case, the LEED Steering Committee did not follow the usual CBDM process.

The Commercial Interiors committee proposed credit was discussed with the LEED Steering Committee, but instead of releasing the draft for public comment, the Steering Committee took an alternative course of action. A new committee, the Technical and Scientific Advisory Committee (TSAC), was created and charged with evaluating evidence and advising the LEED Steering Committee on the basis of adopting a PVC-related credit. As described by the USGBC, TSAC is used to address “contentious issues,” in this case where it had “been asserted that the available science does not support such a credit” (www.usgbc.org). According to Moore, “the PVC issue actually prompted creation of the Technical Scientific and Advisory Committee...[PVC] was the first big question that the organization had hit that it felt that it needed the kind of incredibly in-depth expert advice that the TSAC was able to provide.” The LEED Steering Committee formed TSAC in April 2001. By November of the next year, the

TSAC PVC Task Force was formed to conduct an “Assessment of Technical Basis for PVC-Related Materials Credit in LEED” and to make recommendations to the LEED Steering Committee. Specifically, the Task Group was charged with:

reviewing the evidence offered by stakeholders and independent sources, and advising the LEED Steering Committee on the availability and quality of evidence as a basis for a reasoned decision about the inclusion of a PVC-related credit in the LEED rating system (www.usgbc.org).

Consideration of a credit for avoiding PVC touched off a firestorm among the membership and stakeholders in the USGBC. The *Environmental Building News* reported that informal, but unsuccessful, attempts were made to resolve the disagreement among stakeholders (Environmental Building News 2005).⁹ The USGBC PVC Report Timeline indicates “Strenuous analysis and debate by stakeholder; white papers submitted to USGBC” in the fall of 2000 (see Appendix D). As others see it, the decision to send the PVC issue to TSAC undermined USGBC’s consensus based process:

what should have happened is that [it] should have gone through a committee process and been vetted and maybe edited or reshaped into a better expression of the credit and then voted on by the membership. But what happened by special appeal to the then-executive director from vinyl manufacturers who sat on the Board of Directors is they took that proposal out of the usual process and created a whole new process for dealing with it, something that wasn’t in the usual procedures of the USGBC, something called the technical science advisory committee. They created this whole process for handling this (Walsh, interview).

Edward Benson, my vinyl industry contact, stated that the Vinyl Institute was “shocked and surprised” to see themselves singled out as the only plastic to avoid. According to Benson, the Vinyl Institute contacted their member companies who were also members of the USGBC to ask for justification of “this requirement to eliminate the use of virgin PVC.” Ostensibly, the USGBC could not provide any justification for the proposed credit and thus conducted an internal review, leading to the tabling of the draft.

By the fall of 2007, the USGBC had been dealing with the PVC issue in one form or another for eight years with no decision on PVC LEED credits. During the span of those eight years, the TSAC has sought stakeholder input at several points along the way (see Appendix D, PVC Report Timeline). The first formal opportunity for input followed

⁹ In my interview with Moore, she skips over this period of contention. She was not yet employed by USGBC, so whether it was oversight or a deliberate attempt to downplay conflict cannot be certain.

the December 2004 release of the initial TSAC report, in February 2004 at a stakeholders meeting to specifically discuss methodology. Soon after, 562 public comments were solicited and submitted. In response to extensive comments and white papers submitted by stakeholders, the TSAC expanded its analysis to address new concerns and include new data on end-of-life issues such as backyard burning and landfill fires in the final report (Holowka 2007). They determined eight themes emerged from the stakeholder comments: 1) Influence of report on LEED and momentum for market transformation, 2) Questions about methodology, 3) Concerns about data gaps, 4) The need to explicitly address the Stockholm convention, persistent organic pollutants (POPs), and persistent bioaccumulative and toxic substances (PBTs), 5) Recyclability and end-of-life fate of PVC, 6) Fence line exposures for residents near PVC manufacturing facilities, 7) Roles of fires in the lifecycle of PVC building materials, and 8) Stakeholder input on data sources and assumptions (Altshuler et al. 2007). These themes are discussed in greater detail below.

The summary of themes does not include those comments supportive of the draft. They thus represent how anti-PVC movement members and their supporters frame PVC concerns. Half of the themes (two through four, and eight) reflect methodological critiques specific to the Task Force. Themes five through seven are broader concerns about the use of PVC in general. These concerns are not specific to a PVC avoidance credit in LEED. End-of-life issues have emerged as major points of contention in the debates surrounding PVC in green building. The prognoses for both the health care and green building industries of the anti-PVC movement involves the reduction and elimination of PVC products and materials from their industries. However, unlike health care's emphasis on problems with PVC's use stage, movement protagonists in green building are more likely stress the hazards from PVC in accidental landfill fires and open burning as well as problems with recyclability.

Prior to the release of TSAC's final report, there was much speculation and a bit of disquietude regarding the outcome among stakeholders. Many stakeholders presumed that the report would clarify whether LEED would incorporate vinyl avoidance into its rating system; it did not. The TSAC PVC Task Group's role was to evaluate data and to

advise the LEED Steering Committee on the technical and scientific merits of a LEED credit. In this endeavor, they specifically examined four building applications where vinyl is most commonly found—siding, drain/waste/vent piping, resilient flooring, and window frames—in order to determine whether PVC-based materials are consistently among the worst of the materials studied in terms of environmental and health impacts (Altshuler et al. 2007). In all, TSAC reviewed approximately 2,500 documents, research reports, white papers, and other materials. The committee concluded PVC’s performance relative to alternative materials depends upon two factors: lifestyle scope and whether focus is given on human health or environmental impacts (www.usgbc.org).

PVC’s human health and environmental impacts were evaluated with respect to human cancer impacts, combined human health impacts (including cancer and possible consequences of global climate change, exposures to particulates and mercury, and cancer from environmental releases of metal), environmental impacts (including acidification, eutrophication, eco-toxicity, smog formation, ozone depletion potential, global climate change, and fossil fuel depletion (Altshuler et al. 2007). Life cycle assessments were also included and evaluated with regard to cradle-through-life, end-of-life, and occupational exposures. The following table summarizes TSAC’s findings. Vinyl building products are bolded. A clear pattern emerges with regard to PVC and end-of-life and cancer impacts.

Table 1: Summary of TSAC Findings:

Building Application	Environmental Impact	Cradle→Use	End-of-Life	Cancer
Window Frames	A	A	A	PVC
Window Frames: Worst overall for human health impacts: Aluminum or PVC*				
Pipe	CI	CI	CI/ PVC*	PVC
Pipe: Worst Overall for human health impacts: Cast Iron/ PVC*				
Siding	A	A/FC	A/ PVC	PVC
Siding: Worst Overall for human health impacts: PVC				
Resilient Flooring	Sheet Vinyl	Sheet Vinyl/VCT	VCT	Sheet Vinyl
Resilient Flooring: Worst Overall for human health impacts: Sheet Vinyl/VCT				

Abbreviations:

A – aluminum

CI – cast iron

FC – fiber cement

VCT – vinyl composition tile

Worst overall for human health impacts included occupational impacts.

*Depends upon assumptions and uncertainties.

Discussion

In some ways the variability of the TSAC findings may have raised more questions than they actually answered. PVC opponents and movement protagonists contend the report justifies their position that vinyl has no place in green building, while PVC manufacturers say the report does not. TSAC's commitment to comprehensiveness translated into the ability of different stakeholders to use the report's conclusions to support their positions for PVC or reinforce their diagnostic framing of PVC as a lifecycle problem. For example, PVC pipe was found to have the greatest cancer-related impacts among the pipe alternatives studied, but cast iron pipe was found to have the greatest environmental impact among the alternative materials studied. With regard to siding, aluminum siding was found to generally be the worst material with respect to environmental impacts, but aluminum and PVC vie for the worst for comprehensive human health impacts (Altshuler et al. 2007).

TSAC chairman Malcolm Lewis told *Plastic News*, "Whether PVC is worse depends on where you focus. You get different metrics depending on what values you choose and how you weigh them." (Verespej 2007:1). However, overall, as indicated by the summary chart above, vinyl did not fare well. In an interview following the release of the report, my vinyl industry contact stated that the industry agreed with the task group's overall conclusion that there was "no justification for a blanket credit to discourage the use of vinyl in green building." On the other hand, they strongly objected to some of the other findings and the prominence those findings were given in press materials. In particular, they disagreed with the Task Group's findings on the effects of PVC in landfill fires and in open burning. Benson stated that the issues of these fires are "exaggerated" and "uncertain" to the point of being meaningless to try to determine PVC's contribution

to dioxin in landfill fires. In a letter from Vinyl Institute President, Tim Burns (2007) to USGBC President Rick Fredizzi, Burns expresses the same “deep concerns” and “astonishment” over the “speculative assertions based on highly uncertain end-of life calculations.”

The vinyl industry turned to familiar counter strategies in their response. The comments of Burns and Benson reflect reliance on scientific uncertainty as a counterclaim to argue the problematic condition does not exist. Member companies of the Vinyl Institute were reportedly in ‘disbelief’ over the ‘allegation’ of PVC having the worst lifecycle. They considered the report to be an “incorrect use of science and not good science” by attempting to estimate vinyl’s contribution to open burning and landfill fires. In his letter, Burn draws on another common counter tactic: questioning the credibility of opponents. Burns writes,

VI [Vinyl Institute] believes the dramatic change in characterization of PVC’s life-cycle impact and emphasis on the speculative end-of-life issues without an opportunity for stakeholders to comment seriously compromises USGBC’s goal of an open, transparent process. Over the years, VI has worked cooperatively with a number of consensus-based standards development organizations. We know of no consensus standards development organization that operates as USGBC has in this review.

By questioning the legitimacy of their process and the validity of their scientific methods, the Vinyl Institute’s intent is to cast doubt upon the organization, or at least soften the impact of the report. In a press release following the report’s release, Burns stated, “The fact is that landfill fires are extremely rare in the United States, and the burning of waste at construction sites is outlawed in most jurisdictions, so this is largely a non-issue” (Vinyl Institute 2007). Burns’ strategy is to de-problematize PVC by deflecting attention away from the hazards of burning PVC. In his effort to reframe the debate, he avoids any mention of dioxin emission concerns, a vinyl industry tactic observed by other stakeholders in the movement. In their counter responses, the vinyl industry works to separate ‘dioxin’ and ‘PVC’ in any official publications or documents, emphasize declining dioxin rates, and point to other sources of dioxin or pollution.¹⁰

¹⁰ Movement protagonists credit the decline in dioxin to the closure of over 5,000 medical waste incinerators since 1996 when the U.S. Environmental Protection Agency identified them as the leading source of dioxin in the U.S.

End-of-Life Debates

The PVC TSAC Task Force estimated that 1.59 million tons of PVC waste is generated per year, of which 0% is recovered, 79.2% is landfilled, 20.6% is incinerated and 0.2% is burned in backyards (2007). PVC recycling has emerged as one the major points of contention in current debates. For movement protagonists, the only effective prognosis for eliminating the hazards associated with PVC at the end of its lifecycle is to look upstream. By doing so, movement members propose the use of safer alternatives to PVC or a phase-out in PVC production. Within the green building branch of the anti-PVC movement, end-of-life concerns stem from a greater awareness of the toxicity of the PVC lifecycle. On the other hand, the vinyl industry maintains that PVC has no greater end-of-life concerns than other materials. Benson commented, “The mainstream science has been pretty solid on vinyl’s role in end of the life waste management.”

Recyclability

The industry insists vinyl can be and is recycled. In our interview, Benson seemed excited to talk about recycling. He said it is a myth that vinyl can’t be recycled. To recycle or not is “purely an economic choice, not a technical one.” Vinyl proponents emphasize that because of its chlorine content, vinyl lends itself to automatic sorting technology (Cramer and Perkins Delatte 2004). According to Benson, many recycling companies are looking for used vinyl, but information may be hard to find because of competitive-wary, protective recyclers. Moreover, not all companies are able to recycle all forms of vinyl.¹¹ The industry promotes “The Gates,” the Central Park 23-mile vinyl and nylon project by artists Christo and Jeanne-Claude’s as a testament to vinyl’s recyclability. As the Vinyl Institute (2006) reports, one of the artists’ requirements was that all materials must be recycled at the end of the exhibit.

Recycling PVC is not easy. To avoid contaminating non-chlorine based plastics or damaging equipment, PVC products must be separated from the majority of recyclable plastics. Moreover, because of the variety of additives in PVC plastics, the recycler risks mixing unknown chemicals and losing control over the quality of the final content of the

¹¹ The Vinyl Institute has recently updated its online directory of North American companies with vinyl recycling capabilities. As a point of interest, only one company is listed in Oregon, two in Washington, and fifteen are listed for California.

recycled product. Critics contend recycling PVC is more accurately called 'downcycling' because recycled PVC is always of lower quality than the original material (Thornton 2000). Thornton (2000) points out, "downcycling does not reduce the amount of PVC produced each year or the total quantity of PVC building up on the planet" (p. 316). In an interview, Bill Walsh with the Healthy Building Network describes, "You can take it and kind of mash it all up in a very low grade use like carpet backing, or a bumper in a parking lot, or a traffic cone type of thing, you can get some of these very low grade uses, downcycling of the PVC, which is really only delaying its ultimate disposal." "The Gates", for example, became vinyl fencing and gateposts (Vinyl Institute 2006).

Statistics on vinyl recycling vary. The Grassroots Recycling Network (GRRN), an organization Benson referred to as 'rabid,' reports that over ten years, the recycling rate of PVC was less than 1 percent, going up to 2 percent only during a heavily subsidized attempt by the Vinyl Institute to invigorate recycling (www.grrn.org/pvc). A 1999 industry funded study found less than 1 percent of post-industrial PVC scrap was not recycled (www.vinylinfo.org). However, this scrap was reused directly at the manufacturing facility. As GRRN points out, the scrap PVC waste produced at building sites is often not reclaimed by many salvage and deconstruction operations. From the industry's perspective, low recycling rates are misleading. They are quick to note that many PVC building materials (piping, siding, windows, etc.) are still in service. Because of this, critics are viewed as being unfair when they say vinyl is not recycled. However, in their review of stakeholder comments, the TSAC PVC Task Group reported that they found no "reliable data" to support the PVC industry's argument that all PVC products can be recycled into new products (PVC Task Group 2005).

Landfill Fires and Open Burning

As demonstrated by Burns' and Benson's responses to the TSAC findings, industry reframes the problems with PVC in landfill fires and backyard burning as non-issues. In general, the vinyl industry uses three primary arguments to de-problematize PVC generated dioxin: 1) dioxin is natural, 2) anything that burns produces dioxin, and 3) dioxin emissions have been going down. By reframing dioxin problems in this manner, a

tenuous relationship between PVC and dioxin threats is implied. The industry recognizes that burning PVC produces dioxin, but the frames of opponents are rejected. Repetition of the message that ‘anything that burns creates dioxin’ is intended to deflect concerns from opponents’ arguments that PVC generated dioxin is unnecessary because vinyl is unnecessary. Moreover, this strategy purposely draws attention to the potential hazards of other materials with the intent to make vinyl seem just like other products or even the greenest among alternatives. Industry framing of PVC as being a safe and environmentally-friendly product often occurs through comparisons with other materials. During my interviews with Benson, I was told about the hazards of burning wood, tires and even wool, but my questions about burning PVC were politely ignored.

Disputes abound regarding the frequency and risks of landfill fires. The Vinyl Institute maintains, “Landfilling vinyl products poses no special challenge to the environment relative to other materials” (Vinyl Institute n/d). In our interview, Benson referenced his ten years in the National Solid Waste Management Association (NSWMA), stating, “I never remember landfill fires being an issue. I’m not saying they didn’t happen. They just weren’t an issue.”¹² Again, by directing attention to the infrequency of landfill fires, debates are deflected from the PVC opponents’ claims that avoiding PVC landfilling would reduce the risks from landfill fires.

TSAC Methodology – Life Cycle Analysis and Risk Assessment

The stakeholder comment themes (listed above) included four that focus on methodological concerns. In the TSAC’s efforts to appear scientifically valid and comprehensive, the Task Force relied exclusively on quantitative data analysis through Life Cycle Assessment (LCA) and Risk Assessment (RA). As defined by the Task Force, LCA “endeavors to quantify and characterize all of the resource and pollution flows (inputs and outputs) associated with a particular material over its lifecycle” (Altshuler et al. 2007:3). Risk assessment “quantifies potential risk of developing adverse health affects following exposures to environmental toxicants” (Altshuler et al. 2007:3). Stakeholder response to the methodological approaches in the draft report varied tremendously depending on one’s relationship to PVC. The majority of manufacturers

¹² The NSWMA is a trade association representing for-profit landfill companies in North America.

and representatives of the plastics and chemical industries were pleased with the approach. An American Chemistry Council toxicologist commented, “the approach used to evaluate potential risks was science-based, transparent and utilized established risk assessment techniques” (Becker 2004). A representative of Ferro Corporation (a coatings, chemicals, and plastics producer) emphasized, “It was wise for the authors to keep a debate over the Precautionary Principle out of the report and focus on hard scientific data” (Olson 2004). The Chlorine Institute served as a significant exception, strongly objecting to the report’s section on morbidity and cancer. The section concluded that the continued use of mercury cell technology for chlorine production represents an unacceptable risk to occupational and human health. The Chlorine Institute argued that this statement has no basis in fact and asked that the entire section be rewritten, preferably with their proposed language (Dungan 2004).

The methodology of the draft report was heavily criticized by a range of scientists, physicians, activists, green builders, architects, environmental and public interest organizations, business leaders, health care advocates, and hospital systems as being “ill-suited to addressing PVC’s most salient problems,” “non-validated,” unable to “pass a peer review process,” and failing to be “comprehensive” or “objective.” (see Schettler 2005; Heller 2005; Geibig 2005; Steingraber 2005).¹³ Mary O’Brien (2005), author of *Making Better Environmental Decisions: An Alternative to Risk Assessment*, commented that the narrow risk assessment used by the Task Force “is a classic example of how risk assessment can be used for making an elephant disappear.” O’Brien argues that by failing to assess PVC as the largest contributor for global, cumulative threats from organochlorines or phthalates, the Task Group asks, “what is the certain toxicological impact of the tail of the PVC elephant? What is the certain toxicological impact of the left toenail of the PVC elephant?” rather than assessing the impact of the entire PVC elephant.

By relying exclusively on quantifiable data, the lay experiences of workers and community residents were not included. Thus, while the USGBC emphasizes consensus-

¹³ A complete list of stakeholder comments is available at <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=153>.

based decision-making as a tool for including *all* stakeholders, the knowledge and comments of those most directly impacted are not solicited. The USGBC's approach fails to acknowledge how scientific knowledge is shaped by social forces, and how science is "limited in the method(s) it uses to identify problems worthy of study" (Brown 1992). As Lucia Athens (2005), the chair of Seattle's Green Building Team pointed out to the USGBC, LCA is actually a "qualitative tool, due to the fact that so many of the assumptions used with LCA are subjective or a matter of opinion," adding "LCA is not a pure science, rather it is an art." MBDC, a product and design company currently in collaboration with the USGBC, commented on the undemocratic nature and lack of transparency of LCAs:

By their very nature, LCA studies obscure information because very few people have the knowledge to understand and practice the underlying discipline. There is very little attempt made to convert LCA/RA results into a manageable form for the primary users of the information (in this case, the architecture and design community.) In practical terms, the parameters of a profession's debate about which materials are appropriate to specify and use will be limited to the high priests of the discipline. The majority of the design community will have to trust the assumptions, selection of data (e.g., validity of data sources; how data gaps are treated), selection of impact categories, and weighting of results have been determined in a completely transparent, consistent, and responsible manner (2005).

While the USGBC Task Force made a noble attempt at thoroughness in their review and analysis of several thousand documents, those research studies nonetheless embodied the tenets of traditional science regarding perceived 'objectivity' and 'valid' research. Indeed, TSAC members were chosen for their technical expertise with the expectation that the committee would ultimately be held accountable to what is considered a valid traditional scientific standard of proof. By approaching their task narrowly, the Task Force adhered to standard scientific expectations that an issue can be studied in isolation from its social or political context. Thus they ignored the racial, class, and gendered dimensions of its actions. The USGBC's approach to decision-making reflects the main traditions of policy research, which "based on the rational actor model, hoped to treat policy disputes as instrumental problems that could be solved through the application of a value-neutral policy science" (Schön and Rein 1994:21).

The USGBC is not based on the presumed objectivity of interest groups, but it does assume that the Task Force is or can be objective.

Questions regarding the thoroughness of the data analysis and the credibility of data sources were among the criticisms of the draft report. In official comments of the TSAC draft report, Wilma Subra (2005), president of an environmental consulting firm located in New Iberia, Louisiana, critiques the Task Force for misunderstanding and misinterpreting the ambient exposure data, for discounting five year old data as too old, for averaging multiple years of exposure data, and for dismissing data due to the Task Forces' lack of understanding the data reporting protocols used (2005). The unacceptable effect, Supra (2005) argues, is a dismissal of data signifying risk and thus a failure to protect public health. Architects, Designers, Planners for Social Responsibility (ADPSR) disputes the considerable use of industry sources involved in the literature review. In their opinion, "industry studies of the health effects of their own products can not be significantly trusted" (2005).

Precautionary Principle

Some stakeholders evoke the precautionary principle as the appropriate prognosis for addressing PVC concerns, both for the USGBC materials credit and in green building more generally. Debates over implementation of the precautionary principle are widespread in environmentally-policy making. At the heart of these debates lies the intersection of values and scientific uncertainty. As Meyers (2006) observes, "Values come into play in how we interpret or ignore science and the actions and policies that follow. The precautionary principle focuses public discussion not only on science, but also on the values driving the science..." (p. 31). Like movement protagonists in health care, PVC concerns in the green building branch of the movement are often ethically framed. For these movement members, the actions and decisions of the USGBC should reflect these values. To again quote Lucia Athens (2005), "The USGBC is a values-based organization, and the Board must ask itself if refusing to acknowledge the potential negative environmental and human impacts of PBTs [Persistent Biological Toxic Substances] fits with the values of the Council"¹⁴ The Cascadia Chapter of the

¹⁴ PVC contains PBTs.

USGBC expressed similar concerns, arguing that the “USGBC should explore the underlying fact that this matter [PVC] is less about technical and scientific issues than it is about core values and principles” (2005).

The vinyl and chemical industries are generally skeptical of the precautionary principle. In our interview, Benson lamented, “The problem with the precautionary principle is that it doesn’t help you understand anything—just ‘avoid, avoid, avoid.’” With regard to the Task Group’s draft report, he remarked, “the only comments we saw from Greenpeace or the Healthy Building Network or that side of the debate was, your methodology is wrong...why don’t you drop the whole thing, why don’t you invoke the precautionary principle?” Benson goes on to say, “these sorts of recommendations were not data recommendations,” he adds, “They were process recommendations.”

Precedent Setting?

The decision to form the TSAC is regarded by some movement members as setting a precedent for the USGBC with regards to industry influence. According to Benson, the Vinyl Institute was held at “arms length during the process” and did not influence the USGBC final report through lobbyists or threat of a lawsuit. Nonetheless, some stakeholders perceive that the USGBC may now be at risk for assisting trade associations in “greenwashing” hazardous products. Bill Walsh voiced these concerns in his interview, “What’s really bad from a precedent point of view about the vinyl debate is that it’s encouraged other industries to get very aggressive and hostile with regard to the USGBC in order to appeal to the leadership, outside of the membership process...go directly to the leadership to get a specific favor done.” Essentially, Walsh is arguing that industries are able to circumvent the consensus-based decision-making model through “increasingly hostile and aggressive and threatening tactics.” The Board of Directors from the Cascadia Chapter of the USGBC contended, “These problems will be repeated over and over with each separate issue unless the USGBC adopts a coherent policy on sustainability and identifies clear indicators in the progress towards such a goal” (2005). Michelle Moore, the USGBC’s Vice President for Communications and Community has a different interpretation. In our interview, she said, “It’s less about setting a precedent and more about identifying a need. USGBC has a research committee now for instance

and that research committee has been hard at work on developing a research agenda for the building industry.”

Influence of USGBC's Decision

TSAC attempted to rectify these criticisms in its final report. Because the language of the final report was less supportive of vinyl, there is shift in stakeholder support for the methodological approach. For example, commenting on the Healthy Building Network, Benson states that they “*hated* (emphasis, his) the USGBC’s process and report when the draft report came out. But now it’s [the Healthy Building Network] really happy with the USGBC and their report.” Contrarily, Benson maintains that the vinyl industry has always supported LCA and risk assessment and thought it “was interesting how they put the two together. We thought they were on the right track.” However, Benson indicates that the vinyl industry sees little new data introduced into the final report. Instead, the Task Group just “did more extrapolation and interpolations of the data that they had when the original report and they came out with these different conclusions.” Benson unwittingly alludes to Lucia Athens’ observation that LCA is laden with assumptions. Only now, this approach has been reframed as “speculation.” Moreover, while the vinyl industry may not have considered it ‘new’ data, the Task Force did include end-of-life and occupational data that was left out of the draft.

During the TSAC process, larger questions emerged for the Committee, such as: “Should LEED credits address specific materials, or should they focus on areas of impact? Should LEED offer credits for avoiding less desirable materials, or create credit incentives for the use of preferable, often innovative alternative materials or processes?” (Holowka 2007). As the organization moves to address these questions, they will be guided by the precautionary principle, adopted by the USGBC 2006 as part of its guiding principles. The principle reads, “USGBC will be guided by the precautionary principle in utilizing technical and scientific data to protect, preserve and restore the health of the global environment, ecosystems and species” (www.usgbc.org). The USGBC was the first business association in the United States to adopt the Precautionary Principle.

TSAC’s recommendations to the LEED Steering Committee included developing “guidelines for approval of innovation credits that move the industry forward” (Altshuler

2007: 12). Through “Innovation and Design credits in LEED,” points “are awarded to LEED projects that develop new solutions, employ new technologies, educate, or realize exemplary performance in another area” (www.usgbc.org/news). At least one project with implications for vinyl use in green building has emerged since the release of the final report using Innovation in Design. In May 2007, the USGBC announced an Innovation in Design credit for applying a Cradle to Cradle program for product certification.

The Cradle to Cradle design was developed by William McDonough and Michael Braungart, founders of McDonough Braungart Design Chemistry, LLC (MBDC) and authors of *Cradle to Cradle: Remaking the Way We Make Things*. The goal of cradle to cradle is to address end-of-life problems. As they describe on their website, “Instead of designing cradle-to-grave products, dumped in landfills at the end of their 'life,' MBDC transforms industry by creating products for cradle-to-cradle cycles, whose materials are perpetually circulated in closed loops” (www.mbdc.com). Braungart, a chemist, began studying PVC in 1982 and says building without it is “common sense” (Walsh 2005). In an interview with Bill Walsh in 2005, Braungart stated that he found the TSAC draft report “to be one of the most unintelligent abuses of science in the history of the environmental movement...” (Walsh 2005e). PVC, he says, is a “toxic waste disposal strategy” for chlorine waste. According to Braungart, it costs five times more to dispose of this waste than to manufacture PVC. “It socializes the risk and privatizes the profit” (Walsh 2005e).¹⁵

A separate program, FloorScore, approved in October 2006, also has implications for the use of vinyl in USGBC LEED certified buildings. The FloorScore program is designed to test and certify flooring products with low volatile organic compound

¹⁵ According to its website, “The U.S. Green Building Council does not certify, endorse or promote products...nor do we track, list or report data related to products and their environmental qualities. LEED is a certification system that deals with the environmental performance of buildings based on overall characteristics of the project. We do not award credits based on the use of particular products but rather upon meeting the performance standards set forth in our Rating Systems” (www.usgbc.org). There appears to be a discrepancy with the new credit for the Cradle to Cradle Innovative in Design program. In a May 1st press release, “The U.S. Green Building Council (USGBC) has announced that projects seeking certification under the LEED® Green Building Rating System™ can now earn an "Innovation in Design" point by using the Cradle to Cradle program for certified building products” (www.usgbc.org)

emissions (VOCs).¹⁶ Vinyl is among the flooring products included. The Resilient Floor Covering Institute (RFCI), in conjunction with Scientific Certification Systems (SCS), developed the program. The Resilient Floor Covering Institute is the industry trade association representing North American manufacturers of resilient flooring. While they frame the program as “contributing to good indoor air quality in order to protect human health,” it nonetheless is an attempt to ‘green’ the use of vinyl flooring (among other materials) through the backing of the USGBC.

Market Transformation

“The future of green building does not hinge on what happens to PVC.”

Vinyl industry representative

Until the USGBC LEED Steering Committee formalizes what actions it will take with regard to PVC based on the Task Force’s findings, the influence of the report’s conclusions are somewhat indeterminate. On the one hand, those involved in or supportive of the anti-PVC branch of the green building movement will continue to politicize PVC and push for its elimination in green building. On the other hand, the lack of a definitive position on PVC by the USGBC problematizes potential challenges to vinyl industry claims of ‘greenness.’ In an official comment on the TSAC draft report, Terrence Collins, Thomas Lord Professor of Chemistry at Carnegie Mellon, stated that the expansion of PVC use into the built environment is “currently occurring on a massive scale and it will continue unchecked without government intervention, irrespective of whether a materials credit in LEED is awarded or not” (2005). However, he does not diminish the importance of a PVC credit, adding, “Green certification of building materials is one mechanism for promoting cultural values in the marketplace that protect the public good” (2004). In official comments to the Task Force, Cliff Goldman, President of Carnegie Fabrics, contends that “chlorine chemistry should and will be eliminated in the near future,” and by not supporting this market shift, “USGBC is sending the wrong message to the entire design and building community” (2005).

¹⁶ Specifically in compliance with comply with the volatile organic compound emissions criteria of the California Section 01350 program.

However, having said that, Goldman adds, “Quite frankly I don’t think it will make a bit of difference.” Goldman asserts that manufacturers and designers, rather than large organizations, that are the force behind market transformation. Benson, the vinyl industry representative stated, the “market needs to decide for itself.”

While there may be some positive indications that the USGBC’s lack of a formal stance on PVC is not significantly affecting a market shift away from vinyl’s use in green building, there is also evidence to the contrary. For example, following the release of the report draft, architects with Boulder Associates, Inc., affirmed that since the draft’s publication they had begun to encounter manufacturers of PVC products “citing the report as their rationale of why their products not only do not harm the environment, but are their ‘green’ products” (Boers 2005). Kaiser Permanente expressed concern that “leaving a confused, ambiguous message about the impact of PVC, threatens to confuse the market and undermine the progress that we and many others are making to transform the market in harmony with the well grounded scientific and policy concern over PVC” (Boers 2005).

Both the health care and the green building branches of the anti-PVC movement in of the movement are centered on transforming the marketplace. According to Michelle Moore, the “USGBC’s greatest influence is on the marketplace...I mean it is a tremendously entrepreneurial organization. And capital markets move faster than government policy. Industry sees what’s working, what saves them money, what’s driving demand, what’s driving growth.” Thus, also like the health care movement, some movement constituents are targeted through collective action frames emphasizing the economic benefits of going ‘green.’ In accordance with the tenets of ecological modernization, niche markets are created with “innovative products” and with more companies becoming “engaged in green building as a competitive advantage.” Even the USGBC must compete. As Moore points out, the organization “is constantly reinventing itself to lead the marketplace.”

In an interview with PREA Quarterly, Rick Fredizzi states, “This is almost a moral and ethical discussion, not a cost valuation discussion.” (2007: 25).¹⁷ He contends

¹⁷ PREA is the Pension Real Estate Association.

it is a triple bottom line strategy that emphasizes cost, social equity, and environmental performance. However, because the goal is market transformation, cost savings becomes the motivational frame. Referring to companies such as Wells Fargo, Citi, JP Morgan, Bank of America, and other large investors, Fredrizzi states, “They know there is a solid financial return on the original investment; they know with a little smart practice, they can do the first two levels for LEED for not a penny more than conventional construction. The halo effect of having LEED buildings in their portfolios means higher tenant retention rates, higher marketability” (2006:26).

It is clear that transforming the market is important to the USGBC. However, the question arises: to what degree are the organization’s decisions shaped by their concern with maintaining their leadership position of that market transformation? In other words, as the USGBC continues to grow in size and influence, will the organization be able to retain its core values and principles? When asked about the challenges the USGBC faces, Moore answered, “from a market perspective, the time that it takes to get things done through consensus.” In *Blessed Unrest*, Paul Hawken (2007) suggests that the USGBC “may have had a greater impact than any other single organization in the world on materials saved, toxins eliminated, greenhouse gases avoided, and human health enhanced” (p. 153). That is an extraordinary statement. Hawken (2007) sees the USGBC as part of a larger, widely diverse network of organizations ranging from community development agencies to faith-based groups to corporations that coalesce to form a “global immune system...to identify what is not life affirming and to contain, neutralize, or eliminate it” (p. 145). Absent from Hawken’s praise of the USGBC however, is consideration of what happens to the green building movement, if, as the USGBC continues to grow in size and influence, it becomes unable to continue its already flawed consensus based model.

Rick Fredizzi states, his “biggest hot button is that people say they are going to build a green building but not going to go for the certification, they are going down a very slippery slope of what we call green wash...The third-party certification is a critical part of that investment” (PREA Quarterly 2007:28). The USGBC’s LEED policy manual (2006) emphasizes LEED’s role in market transformation, how to strategically stay on

top, and addresses LEED as a brand, which is “recognized as *the* benchmark for green design” (emphasis mine). In 2004, Fredizzi created a controversy at the opening plenary session of the Greenbuild conference when he stated “If it’s not LEED, it’s not green” (Malin 2004). This comment was offensive to innovative green builders who preceded the USGBC. The editors of *Environmental Building News* pointed out that the cost of LEED certification may be a barrier, particularly for small projects and moreover, “it’s just not true—at least not yet—so making such a claim can be perceived as exclusive and alienating” (Malin 2004). Thus, as the popularity of LEED increases, the goal of organizational protection may supersede the goal of transforming the market and creating environmentally healthy places to live and work.

In a September 2007 Healthy Building News newsletter, Bill Walsh asked to what extent are the shifts in the green building movement transforming markets or transforming marketing? “Transformation,” Walsh contends “is an ideal, but it has also become a buzz-word” (Walsh 2007). By October 2007, over seven months have passed since the TSAC PVC Task Group released its final report and provided recommendations for the LEED Steering Committee to proceed. Yet, no explicit position has been taken on PVC use in green building, much less under the LEED rating system. The USGBC has taken other, more subtle actions that imply the organization is not supportive of vinyl’s use in green building, but without a definitive stance, the USGBC may make itself vulnerable to ongoing industry pressure.

Green Building Beyond the USGBC

The green building movement and the green building branch of the anti-PVC movement extends beyond the USGBC. This section examines the role of PVC in green building outside of the USGBC, particularly with regard to the health care industry. Green building and the USGBC are both receiving increasing media coverage. Recent articles can be found in *Forbes* (October 1, 2007), *Washington Post* (September 11, 2007), *USA Today* (September 20, 2007), *Los Angeles Times* (September 27), as well as numerous local, regional, and international newspapers. However, few news stories seem to address PVC issues. Using interview data, this section includes a discussion of perspectives of a sample of green builders in Eugene, Oregon, including their concerns

and some of the barriers to going PVC-free. I also address several green rating systems that serve as alternatives to LEED.

Green building is much more than certification, rating systems, branding, and market transformation. I asked Rudy Berg, President of the Southwest Oregon Chapter of the Northwest EcoBuilding Guild, for his definition of green building. Rudy contemplatively responded:

I guess for me, it has as much to do with intention as anything else. It's ah, it's a kind of a frame of mind or approach to building in that...in that it takes a long view. And so what I'm trying to do I guess in being somewhat cagey about this answer is to not fall into kind of conventions about defining green buildings or kind of packaged answers to sustainability...I'm increasingly convinced that the successful answers are so particular to a given situation that it's very hard for me to kind of generalize about them.

Rudy's definition includes standard green building features such as low toxicity and minimum long-term damage to environment, but it also includes aspects that Rudy contends don't always receive much notice, such as being "very hopeful" and "beautiful." The building should "sort of take care of itself as well as its occupants." Rudy expresses awareness of the lifecycle problems of PVC and says he while he prefers to not use PVC, more often than not, the client's budget serves as a barrier to complete PVC avoidance.

Rob Bolman, a Eugene builder and former EcoBuilding Guild member with skills in plumbing, wiring, carpentry, and permaculture, says he does not "throw the word sustainable around lightly. You always hear people say, 'oh this is sustainable.' And that's not sustainable. Was petroleum involved in the process? Okay, it's not sustainable." Bolman sees himself as part of the voluntary simplicity movement. He expresses annoyance at the consumer driven lifestyle in the U.S. where "we use all these renewable resources and turn them into stupid, plastic, toxic things and in a very short time, they end up in landfills." Like Berg, Bolman emphasizes beauty in building. Vinyl siding is antithetical to this perspective. Bolman "hates vinyl siding...as a builder, I consider it tacky and ugly just to look at...It's just a total cradle to grave environmental catastrophe." As a proponent of green taxation, Bolman is critical of the externalization of environmental and social costs of materials. He contends, "if the true cost of vinyl windows were accounted for, they wouldn't be manufactured...The manufacturers have no incentive to look for better, more appropriate materials."

Mike Penwell is the design and construction manager for facility management in the city of Eugene, Oregon. His department's role is to plan, design, construct, operate, and maintain the city's buildings. With a background in architecture, Mike says he has followed the evolution of the sustainable building movement. Mike understands the lifecycle problems of PVC, but frames his concerns predominately around fire fighter health. His involvement with the construction and remodels of over twenty fire station projects has acquainted him with a significant number of fire fighters. He says, "I don't like to think about putting things in our buildings that they have to face in the line of duty that could be harmful to their health."

In 2006, *The Green Guide* ranked the City of Eugene as the number one green city from among major metropolitan areas nationwide (EWEB 2007). Eugene has adopted several resolutions on sustainable buildings policies, including a mandate that new construction and additions should achieve a LEED Silver certification level. There is a triple bottom line component to Eugene's sustainable building policies: economic responsibility, environmental responsibility, and social equity. According to Penwell, people have a hard time understanding the social equity piece "because often times, we are detached from the end result of the choices that we make at the level of things like a line worker at a factory, or how things are mined, and so on." The city went beyond the LEED standards in the recent construction of a new fire station by trying to avoid vinyl in all the finished materials: flooring, walls, windows, bumpers, and light fixtures.

However, as Penwell describes,

much to our chagrin, about half way through the project, in the apparatus bay, where they park the big equipment...we looked up there and realized all the main bathrooms were up there and all the drain lines coming out and running out the walls were PVC. So we had worked really hard to eliminate it in all our finishes and there's just an exposed ceiling in there and there's a couple hundred feet where the PVC lines running around the ceiling. And it was like, whoops, okay, next project we got to try to catch that.' But, that was also instructive to us—just how prevalent PVC is and how you really have to think it through.

Penwell has observed a "fundamental shift...away from short-term and toward the long term view" within the design and construction industry and the building ownership industry. The USGBC reflects (and likely contributes to) this move, but contrary to Fredizzi's statement, "if it's not LEED, it's not green," the USGBC does not have propriety rights to green building. Some builders advocate a more radical approach to

building, while others support more moderate measures. The Cascadia Chapter of the USGBC falls under the former. Through their “Living Building Challenge,” they “are attempting to raise the bar and define a true measure of sustainability in the built environment” (McLennan 2007:4). Unlike LEED, there are no credits, but sixteen prerequisites that must all be met. Except where PVC in wiring applications is mandated by code, PVC use is not permitted. The Challenge is directed “to all building owners, architects, engineers and design professionals” (p. 2). It is not in direct competition with LEED, but intended “to provide a signal to the green building industry where it needs to head in the next few years if we are to address the daunting challenges ahead” (p. 4).

A more conservative approach to green building is being undertaken by the National Association of Home Builders (NAHB), which will launch the National Green Building Program in February 2008. The program will be based on the National Green Building Standard, a collaborative effort between the NAHB and the International Code Council. The guidelines for the Standard were developed by 60 stakeholders, including homebuilders, environmentalists, government agencies, but primarily from industry trade associations, including the Vinyl Institute and the American Plastics Council (Wilson 2005). NAHB’s interest in green building was formalized in a 2003 resolution “Support for Green Building” passed by the NAHB Board of Directors. NAHB has also partnered with the Green Building Initiative, an non-profit organization with ties to the chemical and plastic industries. As *Environmental Building News* describes, the NAHB guidelines “are nothing short of remarkable, given NAHB’s past aversion to even voluntary programs” (Wilson 2005). Unsurprisingly, there are no specific references to PVC in the National Green Building Standard Draft Version #1.

Green Building Meets the Movement to Green Health Care

The health care movement and the green building movement intersect when it comes to the greening of health care facilities. In 2008, annual healthcare construction spending is expected to reach \$35 billion (Levin 2006). Currently, less than 3 percent of healthcare construction is considered green (Bristol 2007). The healthcare industry has been slow to join the sustainability movement, but that position is shifting as some healthcare facilities use their purchasing power to build more environmentally

responsible hospitals and other healthcare facilities. Partly, this shift reflects successful frame construction by movement protagonists focusing on creating a healthy building or healing environment, which is likely to resonate with hospital board members or executives. Protagonists emphasize community livability and workplace and patient safety as benefits for the hospitals. For instance, a study conducted by the University of Oregon and Portland architecture firm, Zimmer Gunsul Frasca Partnership, found that rooms with daylight and views help control infections and energy use, as well as improve the psychological well being of both patients and workers (Burnham 2006).

Initial resistance to green building in the health care industry was a combination of several factors. According to green builder Jim Moler, early emphasis in the movement on energy savings did not attract the attention of hospital executives (Moler et al. 2006). Hospitals budget approximately 1 percent of their operating costs to energy. As Moler explains, saving 20 percent of that 1 percent was not a convincing argument. Healthcare executives needed to understand that sustainability is not an “add-on,” but is built into the green building approach through integrated design (Moler et al. 2006). Another problem has been a poor fit between LEED standards and hospital design. The rating system has not accounted for the differences between healthcare institutions that operate around the clock and have special needs due to their patient populations. Other factors that have lead skeptics to believe that hospitals cannot possibly be made green include; hospitals are already heavily regulated, hospitals are complex structures, hospital boards and CEOs are risk averse, and hospitals have too large an environmental impact (Cassidy 2006).

The healthcare industry’s growing attention to environmental and health concerns extends beyond vinyl in medical devices to also include hospital building materials. Vinyl floorings, wallcoverings, wall guards, window treatments, furniture, and PVC carpet backings are all being phased-out. Kaiser Permanente, a leader in healthcare’s transition to greener facilities is replacing PVC roofs, having found that the efficacy and reflective properties of PVC roofs starts to fade after several months (Moler et al. 2006). According to Lynn Garske, Environmental Stewardship Manager for Kaiser Permanente, green building was one of the first things that Kaiser embraced on a national level.

Garske says Kaiser first started having conversations about green building in 2001 and 2002. They knew they planned to build approximately twenty new hospitals by the end of 2010 and they wanted to use their purchasing power to change the market. Kaiser is well regarded for their influence on the industry and for driving many of the changes away from PVC in the sustainable health care movement.

In January 2002, green health care construction was set in motion with publication of the first sustainable design document for health care. The “Green Healthcare Construction Guidance Statement” was followed a little less than a year later with Version 1.0 of the “Green Guidelines for Healthcare Construction.” Released in draft form for public comment, over 1,200 public comments were submitted. Now called the “Green Guide for Health Care” (GGHC), the “sustainable design toolkit” has been released three times since December 2003 and is now Version 2.2. According to GGHC coordinator, Robin Guenther, the GGHC “is a self-certification metric tool that allows the health care industry to measure its environmental performance in facilities construction and operation. It is first such program that incorporates health-based criteria” (Walsh 2005b).

According to Lynn Garske, the “Green Guide for Health Care is really where we get the majority of our guidance in how we are aligning our practices.” Kaiser is affiliated with both the GGHC and the USGBC and is partnering with the USGBC to help improve their LEED standards for hospitals, but determined that the “GGHC construction is more understanding of the healthcare system and...in more cases more stringent on some of the issues [like] PVC.” For Kaiser, PVC is largely a dioxin issue. However, Garske remarked that some people in greenbuilding “don’t acknowledge or want to talk about the dioxin issue, it’s more just the issue that it’s a petroleum based plastic.” On the other hand, Garkse maintained that most of the healthcare organizations have understood the link between dioxin and human health for a longer time.

Whereas the USGBC has not taken a position on PVC avoidance credit, the GGHC has indirectly done so. Elimination of persistent bioaccumulative toxic chemicals (PBTs) and dioxins specifically falls within the materials and resources credit. In the GGHC, the materials and resources credit is intended to “Facilitate the reduction of waste

generated by building occupants that is hauled to and disposed of in landfills and incinerators through reduction, reuse, recycling, and composting” (2007:9-1). This credit stems from the goals identified through the 1998 Memorandum of Understanding between the U.S. EPA and the American Hospital Association that formed H2E. Dioxins are specifically targeted through building specifications that *do not* include chlorinated compounds such as CPVC and PVC, including pipes and conduit, waterproofing, siding, roof membranes, door and window frames, resilient flooring, carpet backing, wall covering, signage, window treatments, wire and cable sheathing, as well as furniture. In operations, PVC reduction is also targeted through waste management, environmentally preferably purchasing, and DEHP elimination credits.

In a 2005 interview with Bill Walsh for the *Healthy Building News*, Walsh asked Guenther about controversies over the GGHC. She responded that she was “shocked about the Vinyl Institute’s portrayal of the Green Guide as a controversial document that is captive to some sort of irrational anti-PVC conspiracy” (2005b). The GGHC’s approach to toxic substances is similar to the USGBC’s TSAC draft report recommendation to work toward eliminating a class of pollutants. As Guenther points out, the Vinyl Institute approved of that recommendation.

“We are helping make things affordable”

Vinyl industry representative

From 1950 to 2004, the size of the average home has risen 140% from 983 square feet to 2,349 square feet, with vinyl siding now accounting for the most-used wall exterior (Solomon 2006). The predominance of PVC in construction is significantly attributable to its relatively low cost when compared to alternatives for some applications. The vinyl industry uses PVC’s affordability to help create a positive public image. My interview with the vinyl industry representatives took place in Arlington, Virginia, an area of the country with a very high cost of living. Benson pointed this out during our interview while emphasizing the cost effectiveness of vinyl. Objections to vinyl siding he contends, are “snob appeal.”

Perhaps the largest current public relations campaign of the vinyl industry involves its support for Habitat for Humanity International. In 2001, the vinyl industry pledged \$1 million over the next five years to Habitat's "More Than Houses Campaign," aiming to raise \$500 million and build 100,000 houses worldwide in five years (www.vinyl.org). According to the Vinyl Institute, this pledge will be carried out through Vinyl Partners for Humanity, a collaboration of the Vinyl Institute, the American Architectural Manufacturers Association, the Plastic Pipe and Fittings Association, the Uni-Bell PVC Pipe Association, and Solutions Through Science, an organization that represents Louisiana's vinyl industry. Communities in Louisiana, where PVC producers such as CertainTeed Co., Dow Chemical, Formosa Plastics, and Pioneer Chlor-Alkali Co., are located, will be the primary beneficiaries of the campaign.

The Vinyl Institute/Habitat for Humanity partnership has not been free of criticism. In spring 2004, Greenpeace, with the assistance of the Healthy Building Network, sponsored the building of a PVC-free home for Habitat for Humanity in New Orleans. According to a local newspaper account, neither the local Habitat for Humanity affiliate nor Habitat International took an official position on the project. Greenpeace intended to undermine the vinyl industry's affordability frame by demonstrating that low cost and PVC-free were not mutually exclusive. Moreover, the act conveyed the message that affordable housing should also be safe for its occupants and healthy for the community. The Vinyl Institute regarded the action as a deliberate political move and sent a letter to Habitat International's President Millard Fuller accusing Greenpeace and the Healthy Building Network of "exploiting the humanitarian ideals and works of Habitat for Humanity" (Kamerick 2004). Jim Pate, executive director of the New Orleans Habitat affiliate commented, "I must admit, the rabid response from the vinyl industry caught me by surprise" (Thomas 2004).

In Benson's view, requiring that the house be PVC-free, is "pejorative" and "not helpful to consumers." In other locales, where Habitat for Humanity affiliates are pursuing the construction of PVC-free homes, he insinuates that activists have been able to convince Habitat workers. In particular, Benson and I discussed Benton and Linn Counties in Oregon. Benson was aware that the Oregon Toxics Alliance and Working

Films had given \$1,000 grants to these affiliates. Benton implies that affiliates would not reach similar conclusions without the persuasion of activists. I attended the dedication of a Habitat house built by the Benton County affiliate in Corvallis, Oregon. The volunteers and partner family did not strike me as particularly naive, but capable of reaching their own conclusions about which building materials they would use.

More recently, the Healthy Building Network (HBN) has been part of a project called the Unity Homes Initiative. In the wake of Hurricane Katrina, HBN spent over a year considering the most productive avenue for applying green building principles in helping to rebuild in the impacted region. The result was Unity Homes—modular, affordable, green houses—and virtually PVC free. HBN organized a partnership among civil rights advocates, community organizations (North Gulfport Community Land Trust, Turkey Creek Community Initiatives), green and modular building experts (the Hickory Consortium), law firms (The Lawyers' Committee for Civil Rights Under Law, Kilpatrick Stockton), and Citigroup Inc. As Bill Walsh explains, “we’re going to show that it is possible to build affordable housing according to green specifications, that green and healthy does not automatically mean a price premium, it’s not something that’s the exclusive province of people who can afford high end homes.”

Costs continue to remain a key factor for builders seeking to eliminate PVC in construction. Green builders cite windows in particular as the biggest barrier to avoiding PVC. Vinyl windows are regarded favorably for their low cost when compared with the alternatives, which can drive up project costs 15 to 20 percent. Some utility companies reward customers with discounts for the purchase of vinyl windows, in essence prioritizing one environmental concern (energy efficiency) over others. Green builders are forced to make similar trade-offs. Rudy Berg admits that he and his clients understand that the use of vinyl windows is problematic from an environmental and human health perspective, but in many cases they end up using them anyway. Berg says, “to the degree that I think my clients can be encouraged in that direction, I try to urge them, nudge them in green directions, or help to educate them if they seem to want to go there.” However, many of his clients are building modest houses and while he tries to raise these issues, he “can only push them so far.”

The lines in the debate over PVC are not always sharply drawn. While members of the anti-PVC movement are adamant in their position that PVC has no place in green building, some green builders recognize the many practical applications of vinyl materials in building projects. As Berg states, “you don’t have to be unreasonable to find things to like about vinyl in building.” Mike Penwell maintains, “Let me first of all say that I think PVC is a wonderful material—you know, it’s durable, it lasts a long, long time, it’s in a lot of building products.” However, as Penwell adds, “Asbestos was a great product too.” Similarly, builders recognize that there is no ideal material; vinyl alternatives often have their own environmental downsides. For example, Berg states, “we’d all like to put wooden windows in our buildings, but then we’d have to figure out how to protect the wood from the elements and that that usually involves painting or something else and that’s got its own environmental downside.” Berg and Penwell recognize the solution lies in finding appropriate alternatives. Bolman’s view is much more bleak: “It’s like we are in the backseat of a car and the driver of the car has fallen asleep and the car is drifting off the road and heading for a large bridge abutment—and this is not a good time to lose control of the car.”

CHAPTER VII
CONCLUSION: THE POLITICS OF TOXICS
TOWARD NEW MOVEMENTS AND NEW ALLIANCES

Kind of like fighting motherhood and apple pie. How can you not support it [phasing out PVC]?

Keith Callahan, Catholic Healthcare West
Vice President for Supply Chain Management (interview)

“There’s an emerging recognition that we can’t continue to do things in the same old way. It is in fact possible to do something people didn’t think was possible and that is – use up the planet!”

Mike Penwell, Design and Construction Section Manager
City of Eugene, Oregon (interview)

In the 1970s, awareness of occupational hazards and the cancer deaths of four workers in the vinyl industry began to draw worker, government, and public scrutiny to the risks associated with vinyl production. Public health advocates and occupational health practitioners joined with unions and consumer groups in challenging the chemical industry’s contention that safe levels of exposure to vinyl chloride monomer were possible. The contentiousness of the battle over a permissible exposure level limit reduction for vinyl chloride signified an economic threat to the industry. The chemical industry and its supporters argued for a risk assessment approach to regulation: weighing worker safety and toxic substance regulations against the economic stability of the industry. The vinyl industry now acknowledges that this was a “sad chapter” in the industry’s history; however, they disagree significantly with Markowitz and Rosner’s (2002) account of industry collusion and cover-ups in *Deceit and Denial*. The industry does not admit to a history of misleading the National Institute for Occupational Safety and Health (NIOSH) or workers, as Markowitz and Rosner claim; rather, they acknowledge that angiosarcoma deaths occurred, but they contend they were unaware of

vinyl chloride's toxicity. This recognition represents the only occasion where industry has admitted that the hazards associated with vinyl have actually warranted any concern.

This first wave of the anti-PVC movement framed PVC concerns around worker safety and public health. After the documented cancer deaths of four workers at a B.F. Goodrich vinyl production facility, the Occupational Safety and Health Administration (OSHA) held an emergency hearing to establish a standard for vinyl chloride exposure. According to Markowitz and Rosner (2002), workers were extremely well supported by the presence of recognized experts and occupational health professionals speaking on their behalf. Worker and public health concerns also merged together following a series of highly publicized fires in the mid-1970s and the early 1980s. At this time, health officials joined with fire fighters in disputing safety of PVC in buildings. The chemical industry denies vinyl significantly contributed to the intensity or dangerousness of these fires. However, following the controversies surrounding the MGM fire in particular, industry recognized the need for better public relations arm to promote and protect their interests, thus forming the Vinyl Institute, the major trade association representing interests PVC in 1982.

A Precautionary Approach

Following the deaths of vinyl chloride workers from angiosarcoma, Markowitz and Rosner (2002) contend, "it was the language of science, rather than politics or economics that dominated the debate about the causes of cancer, the means of prevention, and the responsibilities of government" (p. 218). Use of scientific arguments predominates throughout all three waves of the anti-PVC movement, highlighting the contested nature of the environmental and human health threats associated with the PVC lifecycle. Stakeholders strategize differently around issues of scientific uncertainty and issues of credibility. Movement protagonists draw attention to the harms associated with PVC, while the vinyl and chemical industries downplay these threats. Not all disputes are scientifically framed, but those that are contribute to the development of a public hypothesis as described by Krimsky (2000). Scientific debates are brought into a public forum when segments of the public, including environmental organizations, communities,

health care and green building professionals, feel that they have a stake in the development of a scientific hypothesis. These groups then attempt to better understand scientific uncertainties and the conflicting scientific claims.

Mayer et al. (2002) extend this notion of a ‘public hypothesis.’ Building on Krimksy’s (2000) concept, they emphasize that activists organizing around chemicals and other toxic substances challenge the “dominant ideas and institutional practices regarding the use and disposal” of these chemicals and toxic products and “take up a broad critique of underlying scientific and social processes that shape current worldviews” (p. 576). Mayer et al. (2002) present this ‘public paradigm’ as a broader alternative to understanding how stakeholders shape scientific debates. Specifically, they emphasize the precautionary principle as a public paradigm of growing influence and importance. The precautionary approach is increasing in salience in both branches of the anti-PVC movement. For example, the ANA Board of Directors adopted the precautionary principle in 2003. The principle was also adopted by the USGBC as one of its guiding principles following the release of the Technical, Scientific, and Advisory Committee’s final assessment on PVC in 2007. Not all movement protagonists adhere to a precautionary approach, but they do agree to varying degrees with the basic premise behind it. They support policies that protect human health and the environment in the face of uncertain risks (Tickner 2002). They do not assume all industrial products are safe until proven otherwise. And, they do not feel the need to wait for conclusive scientific proof of harm; instead, they propose adoption of safer alternatives. In an interview, Mike Penwell encapsulates the principle in his approach to PVC use, “if there are better alternatives that are safer and come close to providing the function and durability, etc., then why wouldn’t we go with the safer materials and mitigate the risks of PVC?”

In the early 1990s, Greenpeace kicked off the second wave of the anti-PVC movement with its organochlorine campaign. In the United States, generalized use of the term ‘precautionary principle’ followed the 1998 Wingspread Conference. Thus, while Greenpeace did not explicitly frame its campaign for a chlorine sunset using this

terminology, diagnosing the problem of organochlorines at the production level aligned with the precautionary principle. However, unlike in the first wave of the movement, production workers and fire fighters were not the focus of Greenpeace's concerns. On the other hand, environmental justice concerns had begun to enter into the national consciousness. The technological disasters in the largely white communities of Love Canal, in 1978, and in Times Beach, in 1983, had helped put a public face to risks from dioxin and other environmental threats.¹ The ongoing struggles of mostly African American and Cajun communities against the petrochemical industry in Louisiana and Texas did not receive equal media attention or national sympathy, although some events, such as the 1988 Great Louisiana Toxics March, generated support and valuable media coverage. Both radical and traditional environmental organizations joined with labor unions in a march from Baton Rouge to New Orleans, "to protest the destruction of the southern Mississippi region...an industrial wasteland of enormous chemical factories spewing filth on a massive scale" (Markowitz and Rosner 2002:250).

'Prevention' is fundamental to the philosophy of health care. Generally, health care professionals approach prevention by focusing on individual lifestyle behavior, such as smoking, diet, and exercise, rather than environmental or occupational factors. In some ways, embracing a precautionary approach to toxics is at odds with the biomedical training of health care professionals. Environmentally-induced illness are difficult to diagnose under the biomedical model. The biomedical belief of disease specificity (the idea that each disease is caused by a specific, potentially, identifiable agent (See Dubos 1959) and mind/body dualism, maintains that each disease or syndrome has characteristic qualities and causes specific to that particular category of disease. This leads to not only focusing on the individual rather than on the social and contextual elements of illness, but also treats the body in isolation from other aspects of the person that inhabits it (Freund and McGuire 1999). With environmental illness, disputes over etiology exist in part

¹Love Canal residents were evacuated in 1980. The final Superfund cleanup decision for the Love Canal was not signed until October 26, 1987 (www.epa.gov/history). In 1983, the U.S. E.P.A., the Federal Emergency Management Agency, and the State of Missouri announced the allocation of funds for the permanent relocation of the residents of Times Beach. A settlement in the lawsuit concerning the clean-up of Times Beach was not reached until July 1990 (www.epa.gov/history).

because few toxics are known to lead to specific environmentally induced diseases (e.g., asbestosis and mesothelioma) (Brown 2000).

A precautionary approach both complements and contradicts medicine's view of health and disease. Within the health care branch of the anti-PVC movement, frame construction largely centers on the suspected harm for humans from PVC leaching DEHP. Replacing PVC/DEHP IV bags with those that are PVC/DEHP free is a precautionary measure to minimize risk, but this action does not fundamentally undermine the biomedical model. Nor does the switch to PVC free devices or PVC free health care facilities undermine medicine's authority to determine, diagnose, or treat diseases. The demand for alternatives to PVC/DEHP from vendors and manufacturers has largely come from non-physicians in large health care systems and HCWH. Moreover, the increasing role of nurses as drivers of the transition to a "healthier" health care system, may represent a desire to advance the profession of nursing and to show, as Registered Nurse Marian Condon said, that "nurses are not little doctors."

There is an important difference between a scientific uncertainty within the health care community and a contested illness. PVC risks are certainly contested, but these debates largely take place *between* industry and health care, rather than *within* health care. Ethical considerations and concern for public health, especially the health of children and infants, are often involved in the decision to go PVC free. Ethical frames and children's health frames complement values of prevention (first, do no harm) and precaution. In health care, there is an acknowledgement that there may be problems with PVC and DEHP and so efforts are made to avoid them, but unlike some other environmentally-induced health problems, movement protagonists see the 'cause' as locatable—in the IV bag. Industry and some manufacturers dispute this claim, maintaining that there is no evidence of harm to humans from DEHP. However, many in the movement point out that DEHP is only one of the many phthalates that humans are regularly exposed to. HCWH has unsuccessfully petitioned the FDA to examine the aggregate or cumulative effects of phthalates. According to an interview with Stacy Malkan, "they've said they see no basis for looking...at this point."

Citizen participation in the democratization of science is a key feature of the precautionary principle (Mayer et al. 2002). Because the principle shifts the burden of proof onto industries to provide assurances of safety, critics denounce the approach as unscientific, unnecessarily costly, and anti-technology (Myers and Montague 2006). Industry is resistant to the democratic decision-making model fundamental to the precautionary principle because such an approach presupposes non-economic values are given due consideration. Political and economic concerns are often couched in scientific criticisms; however, technological and methodological uncertainties are not unique to the precautionary principle, but rather are common features of scientific study (Barret 2006). In the U.S., public participation in government decision-making is discouraged by the “tightly focused, science-based systems” where nonexpert opinions are devalued and viewed as incongruous with the regulatory systems (Barret 2006:258). Moreover, not only does government decision-making deemphasize public contributions, it treats stakeholder input inequitably. Shriver et al. (1998) contend that the different levels of power and state support among social groups is reflected in the ability of certain groups to impose their versions of reality onto the public. “Imagine,” they suggest, “a scenario in which illness is attributed to industrial pollution” (p. 459).

The state’s role has been to protect and legitimize the interests of industry. The state responds to public outcries during periods of profound public dissatisfaction with government by implementing incremental reforms, which restore public confidence in the idea that the system can meet people’s needs (Waitzkin 1983). Minimal changes may be made to the public health system or to regulatory agencies such as the EPA and OSHA, but as Cable and Cable (1998) assert, effective regulation may lead to the decline of industry profits, which could threaten the state’s accumulation function. Alternatively, the state’s legitimacy function could be threatened by its perceived failure to regulate industry (Shriver et al. 1998). Nevertheless, some U.S. policies and government agencies do incorporate aspects of a precautionary approach. Myers (2006) points to the FDA’s requirement that all new drugs must be tested before being put on the market, the

National Environmental Policy Act, the Food Quality and Protection Act of 1996, which has a protective feature for children, and the Toxic Substances Control Act, as examples.

Ecological Modernization

Adoption of a precautionary approach is not altogether incompatible with ecological modernization. This is particularly true for both the green building and health care anti-PVC movements, which seek to transform the marketplace through increased environmental stewardship and through technological and product innovation. Myers and Montague (2006) counter industry arguments that the precautionary principle ‘will stop technology in its tracks’ or ‘prevent adoption of safer technologies’ (p. 120). Instead, they contend that, “A broad precautionary approach encourages the development of *better* technologies” (p. 120, emphasis in original). Cohen (2006) notes that American environmental movements have traditionally “sought political traction by defining themselves in opposition to economically and politically powerful interests” (p. 538). However, this fails to describe both branches of the anti-PVC movement, which are comprised of strong and influential stakeholders. While the chemical and plastics industries have long been cornerstones of the U.S. economy, the building and health care industries of the economy are also very powerful. Moreover, while some organizations such as Greenpeace and the Center for Health, Environment, and Justice do openly challenge the vinyl industry, this is not a strategy commonly used by the health care and green building professionals involved in the anti-PVC movement.

According to ecological modernization theory, the synthesis of economic growth and environmental protection will mean the industrial operations of some companies will change to reflect greening modes of production and consumption, while others, failing to ecologically adapt, will be unable to economically compete. The prognostic framing of the anti-PVC movement emphasizes production of safer and more environmentally friendly alternatives as the solution to PVC’s toxic lifecycle, with the ultimate goal of a PVC phase-out. This strategy reflects the “efficiency revolution” (Huber 2000), allowing

“further economic growth and ecological adaptation of industrial production by improving the environmental performance” (p. 269).²

Cohen (2006) argues that the American environmental movement is out of step with ecological modernization, but submits that anti-pollution activists are most likely to embrace, if hesitantly, the tenets of ecological modernization. Thus, not all environmental organizations are supportive of ecological modernization as a solution to environmental problems, although social movements are perceived as playing a fundamental role in the ecological modernization approach to sustainability (Mol and Sonnenfeld 2000). Interestingly, ecological modernization proponents characterize Greenpeace both as one of a handful of environmental organizations receptive to innovative change consistent with ecological modernization (Cohen 2006) and one of the leading NGOs arguing for an unrealistic and undesirable approach to sustainable development (Huber 2000). Greenpeace has been recognized as the leading international non-governmental organization (NGO) calling for a precautionary approach to chlorine (O’Brien 2000).

York and Rosa (2003) argue ecological modernization is incompatible with the development of ecological sustainability. Instead of continued modernization being required for ecological sustainability, it is “a greening of business as usual—thereby avoiding such challenging alternatives as radical structural or value changes in society” (p. 274). Both branches of the anti-PVC movement are part of larger movements to green the health care and the building industries. The goals are to reduce ecological impact through greater energy efficiency, less reliance on or phase-out of toxic products and materials, waste minimizations, decreased resource utilization, and increased recycling rates, with the intent to become more sustainable industries. The health care arm of the movement is also increasingly adopting green chemical policies, which are both precautionary in nature and consistent with ecological modernization’s emphasis on scientific solutions to environmental problems. However, as York and Rosa (2003) point

² Huber (2000) is not proposing an efficiency model, but maintains that is the strategy employed by industry and businesses seeking to combine economic growth with environmental protection. In its place, he proposes a strategy of ‘consistency’ where “industrial metabolism is consistent with nature’s metabolism” (p. 269).

out, “reductions in the resource intensity of a single industry may or may not be indicative of the total effect of the economic processes in that industry on the environment” (p. 279). This concern was partially reflected in a comment made to Sister Mary Ellen at Catholic Healthcare West by another Nun in the Dominican Order from Trinidad, regarding Catholic Healthcare West’s developing chemical policy. To paraphrase, the Sister from Trinidad said, she sure hopes that when Catholic Healthcare West comes up with their green chemical policy that they make sure that the chemicals they no longer want are not sent down to Trinidad.

Treadmill of Production

In contrast, Schnaiberg’s (1980) theory of a “treadmill of production” argues that capital accumulation increases profits through replacing labor with new technologies. Greater inputs—through energy, natural resources, and chemicals—are needed to run the technologies that replace human labor (Gould, Pellow, Schnaiberg 2004:296). This process repeats itself, and the treadmill accelerates with each round increasing the level of production, demanding more natural resources, and weakening the position of the worker. According to Schnaiberg (1994) “the core logic of the treadmill is that ecosystem elements are converted by capitalists through market exchanges into profits” (p. 25). By using ecological modernization theory and the treadmill of production, my intent is not to generalize from the PVC case study to make a larger economic argument, but to better understand the movement. This approach is particularly relevant given that many movement protagonists view their efforts as a move toward ecological sustainability.

The anti-PVC movement is not a direct challenge to the U.S. political-economic system. Schnaiberg (1994) writes, “The treadmill and its associated class structure is reproduced by a shared commitment of virtually all actors in advanced industrial society to some form of economic expansion, in order to meet their material needs” (p. 25). The vinyl industry has lodged the harshest criticisms at Greenpeace and the Healthy Building Network, but implies that the goal of the movement as a whole is to bring down the entire chemical industry. Bill Walsh, of the Healthy Building Network, says otherwise. Walsh

asserts, “I defy you to find on our website, or any critic of PVC’s website, a broadside against all chemicals. In fact, the exact opposite is true... We think PVC is a product whose time came and went among the plastics, that PVC shouldn’t be in the palette of plastics that a contemporary society uses as they have an eye toward sustainability” (interview, Walsh). However, the consistent singling out of Greenpeace stems in part from the organization’s original goal to phase out chlorine chemistry. Should the current anti-PVC movement have measurable successes (e.g., a significant economic impact on vinyl production), the industry realizes that it is not inconceivable that the movement, or at least a faction of it, would return to chlorine chemistry as a diagnostic frame. Such an act would not destroy the treadmill, but it could have serious implications for the plastics and chemical industries.

Sustainability is met not by curtailing growth, but by committing to a more precautionary approach to growth and whenever feasible using one’s market power to influence the economy in a positive direction. Keith Callahan of Catholic Healthcare West explains, “That’s the whole point of this. We are large and as we’ve banded together with Catholic purchasing groups...when we do make a decision, it has at least a national impact on the market, absolutely. And, to be perfectly honest, why not leverage it?” Although movement protagonists do not use the language of ecological modernization, they share in the ecological modernization (EM) perspective as described by York (2004), “The EM perspective is based on progressivist assumptions that see modernization as a self-improving process that moves society in a clear direction toward a better future” (p. 360).

In *Green to Greed*, USGBC founder David Gottfried (2004) clearly articulates that this shift will not occur by radical changes, but only by working within the system:

The underlying ethic of all business is profit. This is the entity’s responsibility to partners and shareholders. Another given is growth—growth in sales, market extent, number of products, workforce, resource consumption, and profit, and net worth. That’s America. Trying to fight this is impossible, like trying to move a mountain with a shovel. Building owners will only embrace green building when it is tied directly to their bottom line: rental rates, tenant leasing, lower expenses, higher occupancy rates, greater loan amounts at lower interest rates, higher building sales prices, and improved returns on investment. These parameters are the pulse of the business of real estate and dearest to the owner’s heart. Many environmentalists refuse to comprehend this given. Greenpeace may have shifted big corporations a few degrees in their normal course of business by

staging dramatic strikes, blocking ships from delivering their goods, and other such efforts, but a more pragmatic approach would be to change how we make money and define financial value (P. 105).

Anti-PVC movement protagonists do not explicitly critique the treadmill, nor do they examine the conflict between the acceleration of the treadmill and increasing ecological problems. However, Schnaiberg recognizes that “A major unpredictability within the treadmill is the level of material interest and political expression of such interest by those who are largely dependent on wage income derived from the treadmill” (Pp. 28, 29). Activists in health care and green building are dependent upon the treadmill; thus, they do not challenge growth in their respective industries, but they are not dependent on PVC or its production. As professionals and potentially unionized, unlike some lower wage earners, they may have greater job security and thus, they are not as likely to risk unemployment over their activism.³ They have more power in their jobs and because of their separation from the site of production; professional activists are not at risk from job blackmail. Moreover, a strength of the movement has been its ability to form successful coalitions, both in healthcare and green building. According to Schnaiberg and Gould (1994) coalition formation is essential if environmental goals are to be achieved in opposition to the forces that promote the treadmill. Indeed, Gould, Pellow, and Schnaiberg (2004) acknowledge that much of the limited success in altering the treadmill has been attributable to the collective action of social movements and nongovernmental organizations “through pressuring private capital and/or state decision makers to make more proenvironmental decisions in production processes” (p. 302).

PVC opponents are not seeking changes in the forces of production. The push for PVC alternatives is only a change within the treadmill, not an elimination of the treadmill. PVC opponents rely on the market for success and strategize to create market-shifts as much as possible. Those companies that provide alternatives to PVC are then able to promote themselves as environmentally responsible corporations. According to Gould, Pellow, and Schnaiberg (2004):

³ According to my interview with the vinyl industry representatives, none of the PVC production facilities in the U.S. are unionized.

Unfortunately, consumerist approaches to the problem of the treadmill almost never consider the goal of treadmill deceleration. The question of how much we are consuming (i.e., growth) is rarely challenged. This is perhaps not surprising, as consumerist approaches are fundamentally about protecting the right to consume as much as they are about corporate and social responsibility (P. 302).

Similarly, with regard to ecological modernization theory, York (2004) argues that while ecological modernization theorists point to the ability of capitalist firms to be profitable through improvement of their environmental performance, this is only primarily feasible for market niches (i.e., PVC/DEHP free medical devices) and only so long as such changes are profitable. As an illustration, B. Braun has been able to emerge as an environmental leader for developing the first PVC/DEHP free IV bag. In 2006, both Hospira, Inc. and Baxter Healthcare Corp. publicly announced introduction of their own PVC/DEHP free IV lines. However, Baxter's new IV equipment is targeted for niche markets and the company does not acknowledge the associated health risks of PVC/DEHP. On the other-hand, upon announcing their new product line, Hospira portrayed itself as an environmentally-friendly company. In a 2006 interview, Hospira CEO Chris Begley stated, "As I always tell the organization, being environmentally responsible is just the right thing to do" (Blanchard 2006). In 2007, Hospira won Business Week's IDEA (International Design Excellence Award) for Best New Product Design for a non-PVC product. Regardless of Begley's ethically-framed pro-environment statement, Hospira (and other medical supplies producers) will only develop and produce PVC/DEHP free IV bags or other environmentally-friendly products as long as it is profitable for them to do so. Moreover, both in the health care and the green building industry, there is little critique or discussion of the rest of these companies' product lines or their greater ecological footprint.

Some of the more publicized successes in reducing PVC use have been in packaging (i.e. Microsoft, Wal-Mart, Target). PVC packaging phase-outs do not require any institutional changes to the treadmill. In his description of the focus of CHEJ's PVC campaign, campaign coordinator Mike Schade explained in an interview:

But, if you think about 'how can we be most successful? Can we be most successful at contacting companies that manufacture the materials? Or, do we have a lot more leverage over companies that make consumer products that are either using or packaging

this material in their products?' Those companies are much more vulnerable to this issue...they do not have a financial stake in this material being produced. They're not manufacturing the product; they are just using it in their products. So for them, they don't really care too much what type of product they use, whether it's polyethylene, um, whether it's polypropylene, whether it's a plant based plastic.

The overriding objective of CHEJ's PVC Campaign is "to prevent the production, use, and disposal of PVC products;" however, the specific campaign goal is "to eliminate PVC in consumer products and packaging" (interview, Schade). No figures exist on how many millions, or more probably billions, of pounds of PVC are being eliminated as a result of this campaign.⁴ CHEJ purposefully targets end-users rather than producers, since these companies are perceived to "have significant leverage over the manufacturers of PVC" (interview, Schade). While this approach appears to ignore the greater impact of PVC's lifecycle, Schade insists it does not: "One of the reasons we've been focusing on products and packaging specifically is because a significant percentage of the PVC that's disposed in incinerators and municipal solid waste incinerators are short-lived PVC products like different consumer products and packaging." The question then arises, how much of an effect is this market-shift in packaging really having on PVC production?

PVC production is not a stand-alone industry. It is intimately linked with petrochemical, vinyl, plastics, chlorine, and phthalates producers and their trade associations. These industries are not competing, but have the same political-economic interests. As a case in point, PVC supports the chlorine industry as its biggest user. Different additives (i.e. lead) and phthalates may be the "unwanted stepchild" at times, particularly when social movement organizations have successfully drawn attention to their associated health risks. For example, my vinyl industry contact stated, "strictly speaking, we don't represent the phthalate industry." During our interview, Benson somewhat distanced himself from the industry when I questioned him on the safety of phthalates, but he would not be overtly critical. Referring to recent concerns about lead in vinyl products, Benson pointed out that the industry is somewhat powerless over what's imported. The problem, he insisted, is not vinyl, but the use of lead as a stabilizer. Even though PVC

⁴ As an example, earlier this year, Hewlett Packard announced it was eliminating the use of more than 6.8 million pounds of polyvinyl chloride (PVC) plastic through material reduction and substitution of recycled content plastic and paperboard (www.hp.com).

supporters sometimes recommend using alternative plastics for some PVC applications (e.g. polyethylene plastic for piping or TPO [thermoplastic elastomer polyolefin] for roofing membranes), I did not find evidence that industries that may benefit from PVC's demise were part of any campaign to politicize PVC. In some cases, companies are vertically integrated, producing a diversified set of plastics (Ackerman and Massey 2003). Moreover, vinyl companies will find ways to replace any lost surplus, either through the development of new products or through market expansion.

The issue of phasing out PVC begs the question, "How would greater regulation of PVC or a PVC phase-out affect PVC production employment rates?" In "The Economics of Phasing Out PVC" Ackerman and Massey (1993) conclude that they would not affect employment rates. Production of PVC alternatives is regarded as likely to require about the same total employment as PVC production. However, while Ackerman and Massey (1993) predict that many PVC workers would likely be employed making PVC alternatives, some will not. Production workers are only marginally included in the PVC debates. Perhaps this is because green building and health care activists use collective action frames that resonate within their respective industries; hence, the impact of PVC production and a PVC phase-out on other workers is not well attended to by many in the movement. On the other hand, since the anti-PVC movement has not diagnostically framed worker issues as concerns, the vinyl industry makes no counterclaims emphasizing the potential job loss that may accompany a phase-out. Moreover, this may not be an issue that generates a strong public grievance for three primary reasons that reflect class and racialized biases; 1) the decline in working-class manufacturing jobs have become a commonplace feature of U.S. economy, 2) PVC production facilities are located in poor, working-class, and predominately African American communities, and 3) an economic/environmental divide that would likely prioritize the environment. Even in Ackerman and Massey's (2003) forty-five page analysis, only four pages are dedicated to the potential employment impacts of a PVC phase-out. To quote Ackerman and Massey (2003):

...the money that is now spent on PVC products, the uses of those products, and the jobs created by production and use of PVC will not disappear from the economy in transition

to alternative materials. The skills that are needed to make many products out of PVC will still be needed to make the same products out of something else; there is no evidence that the substitutes would require less labor or that resources spent on clean alternatives create fewer jobs than resources spent on PVC (P. 36).

The mostly likely outcome of greater regulation of PVC or less use of PVC within the United States is increased overseas production of PVC. Thus, the PVC problem would only be externalized beyond our nation's borders. In fact, China currently has the highest rates of growth in both PVC supply and PVC demand (Harriman Chemsult 2007).

Some movement protagonists and organizations do address worker issues, but have yet to formulate workable solutions to potential job losses associated with a PVC phase out. According to Mike Schade, CHEJ's goal of PVC elimination in consumer products and packaging is,

to be done in a way that doesn't put workers out of a job, but is done in a way so that workers are trained to make safer products. And, to switch to safer production practices. We don't just want to shut down that PVC industry and put people out of work. But we want to do so in a way that is respectful of communities, respectful of workers, and in cases where workers can't be trained to make new materials, they would be reimbursed for their job loss. They would either be reimbursed or receive job training to work in new sectors.

When I asked how that would happen and who would fund the worker training, Schade good-naturedly responded, "Well, we're working on that!"

The USGBC uses LEED to target "early adopters of green building practice" and to "promote green building practice into the mainstream" (LEED Steering Committee 2006). The USGBC's objective of transforming the market is less of a metamorphosis than an alteration or modification in business behavior. LEED certified buildings may have tremendous importance for the residents, workers, or shoppers of a green building, but as York and Rosa (2003) observe, the ecological improvements depend upon the unit of analysis. The USGBC's Michelle Moore maintains that managing the growth of the organization is one of the USGBC's challenges. 'Growth' is an important element of the USGBC model: economic growth, member growth, number of accredited LEED professionals, and the amount of square footage certified or under review for certification. The ecological impact of a LEED building compared with a traditionally constructed building is likely to be lower, but with no reduction in overall construction,

LEED's contributions to a sustainable society may be negated. While 'reduction' of the ecological footprint of buildings is ideal, 'growth,' is viewed as the way to achieve it. As Foster (2007) observes, this approach is consistent with the "dominant solutions—those associated with dominant ideology...emphasize minimal changes in business as usual that will somehow get us off the hook" (p. 8).

The USGBC does not intend for LEED to target "deeply green building," although innovation credits are provided "for rewarding innovative green practice" (LEED Steering Committee 2006). USGBC President Rick Fredizzi has made clear that he finds it unacceptable to build 'sustainably' without third party certification. Third party certification involves more costs, as well as the creation of niche markets that provide these services. Architect Mike Penwell points out, "you can get LEED certification without really doing an extremely sustainable building and you can do an extremely sustainable building without using LEED" (Interview, Penwell). Economic arguments are used to encourage businesses to sign up for LEED. Businesses, governments, educational institutions and others conduct a cost-benefit analysis; can we build 'green' and not be forced to change our operations? Michelle Moore maintains that to achieve a LEED silver rating, the average initial first cost is about 1 to 1 1/2 percent more than using conventional building materials. Over time, as project teams become more familiar with LEED's integrated design process, this cost goes down. In other words, it won't hurt 'business as usual.' Moore's philosophy is consistent with the optimistic view of the future held by ecological modernization theorists. According to Moore:

There's been a popularly held impression that environmentalism and sustainability was something that was fundamentally rural and something that was fundamentally disconnected from civilization...you know from modern society...When you have that sort of history of a movement and everyday experiences that tend to affirm the fact that you are going to give something up to be green, it's a little bit hard to believe for people sometimes that you can build something as expensive and technological and complex as a building, have it be better on the sustainability scale and cost less in the end to operate. It's counterintuitive based on people's experience with the history of the environmental movement, but once you kind of 'get' what sustainability is, it's really about working in an environment of abundance, rather than thinking in terms of scarcity (interview).

In *The Ethics of Environmentally Responsible Health Care*, authors Pierce and Jameton (2004) sort environmental health problems into two categories: downstream effects – “what happens to materials and tools after clinicians and patients toss them into wastebaskets or recycling bins, place them in needle or hazardous waste containers or pour them down the drain”—and upstream effects—“those involving extracting and processing materials, and their manufacture, packaging, and distribution before they reach the hospital” (Pp. 115-116). Efforts within health care have attempted to reduce both the upstream and downstream impacts of PVC. As medical waste incineration has declined, other waste management enterprises and medical waste recyclers have entered the treadmill to deal with the change in terms of the downstream effects. As Schnaiberg (1994) notes, “Public (and social movement) consciousness of ecosystem disorganization is, after all, a necessary element in expanding the markets for their waste treatment services” (p. 36). In terms of upstream effects, companies respond to fill the niche to develop PVC-free product lines. Schnaiberg (1994) further maintains, “Thus, while the major response of capitalist actors has been to resist much new environmental regulation designed to enhance the use values of other classes, another segment of this dominant class has extracted new exchange values from environmental protection activities of the state” (p. 34).

The phase out of PVC in packaging aligns with our general societal approach to environmental stewardship; what can we do as individuals to protect the environment? The main effect of the Center for Health, Environment, and Justice’s product and packaging reduction campaign is to make it easier for consumers to feel better about making ‘environmentally-friendly’ product choices. This approach requires no state intervention, nor does it change the core logic of the treadmill, converting elements of the ecosystem into profits (Schnaiberg 1994:25). However, the professional/labor/environmental health coalition approach of the anti-PVC movement poses a more formidable challenge to the industry than would any SMO standing alone. While CHEJ’s market-driven campaign may not be having a substantial impact on PVC production, or even PVC use, Schade accurately recognizes that such an approach leaves

companies vulnerable to negative media attention and public scrutiny. This is particularly true given the increasing demand in health care and green building for PVC alternatives, which comprise a tremendous proportion of overall PVC use. Industry, and specifically its trade associations, must keep abreast of the anti-PVC movement and be concerned with the movement's next action. Rather than merely framing PVC as a beneficial, safe, and versatile product, they must be prepared to counterframe the issue and to counterattack.

Comparisons Between the Health Care and Green Building Arms of the Movement

There are a number of comparisons to be made between the health care and green building branches of the anti-PVC movement. In this section, I explore major similarities and differences between the two. In particular, I compare the overall movement structure, considering the influence of the organizational structure of the groups involved and how this may affect individual activism within these groups. I examine the similarities within the movement branches attributable to the status of members as professionals and organizations working with the system. I compare the types and levels of interaction within the movement branches, ability to transform the market, tactics and ability to affect change. Finally, I discuss the countermobilization strategies used against social movement organizations from both arms of the movement.

The healthcare and building industries are major users of PVC and both industries have an extremely large ecological impact through greenhouse gas emissions, energy use, waste production, and the generation of toxic pollutants. PVC reduction is only one piece of a move towards sustainability for both branches of the movement in their efforts to reduce their ecological impact. The green building movement initially formed to address energy conservation concerns and the anti-PVC movement in health care emerged in response to dioxin concerns directly associated with PVC's use in the industry. This initial explicit link to PVC related harms partly explains the lower levels of controversy in the industry compared with green building. Of the two branches, the green building movement is significantly less unified than the health care branch of the movement. For example, the USGBC, the green building movement's preeminent organization, has never

taken an explicit position on PVC. This contrasts significantly with the leaders of the anti-PVC movement in health care who are forthright in their opposition to PVC use. Both branches of the movement rely on a coalition or network model for accomplishing their goals, with many of the core organizations partnering with groups representing the semi-periphery or even periphery in their respective industries. The green building movement has a longer history than the contemporary health care movement; however, owing to the unsuccessful attempts at designing ecologically sustainable buildings in the movement's formative years, this history has not necessarily functioned to its advantage. The health care industry's more pronounced stance on PVC does not mean that all of the health care industry is onboard with the move to phase-out PVC or to engage in more sustainable practices however.

The anti-PVC movement is occupationally driven. While both the health care and green building branches of the movement are represented by an array of movement participants—including politically moderate professionals, businesses, environmental organizations, public interest groups, and more radical activists or champions—these movement members largely reflect the interests and values of the professional class. There is no one dominant structure determining the approach or strategy for the movement as a whole, but movement framing, tactics, and recruitment efforts are influenced by the class position, professional power, and status of movement decision-makers. Individual activism is also impacted depending upon one's organizational and social location. For example, the organizational structure of Kaiser Permanente and the Healthy Building Network are very different. Within organizations, encouragement and support of activism varies most significantly by whether an organization is primarily advocacy oriented or business oriented. For example, while the health care branch of the movement is more likely to recognize individual 'champions' in comparison with the green building industry, in large health care systems such as Kaiser and Catholic Healthcare West, product and purchasing decisions are made at the top. Decisions to deselect PVC were passed down to nurses and other healthcare workers through educational means, such as flyers or posters. As Lynn Garske from Kaiser explains:

Champions are important, but the best blend is a champion in a place where they can make a decision. So there may be a champion at a medical center, so we would really focus on the environmental stewardship manager who has to train the employees who has to decide where to throw the trash away on the back dock when they've collected it from the bins, and that kind of thing. So a champion can drive it, but a lot of our operational and functional effort is really focused on the people that can actually make the change.

Rose (1997) contends that “middle-class faith in expertise-based change is encouraged by the fact that the people who run government are generally professional and middle class like the activists in these movements” (p. 481).⁵ He interprets this as meaning that “the bureaucracy then appears more benign and accessible to these groups” (Rose 1997:481). In terms of tactical approaches, this familiarity with the bureaucracy translates into ‘faith’ it will do the right thing. The relationship between anti-PVC SMOs and the government is generally not adversarial. For example, the Oregon Center for Environmental Health, an organization made up of professionals, receives funding from the U.S. Environmental Protection Agency. According to Neha Patel, even in situations where there are differences, these disputes are not resolved in a contentious manner. EPA representatives and bureaucrats are more appropriately understood as peers, rather than opponents of the constituents of the OCEH. However, as stated elsewhere, this is not to imply that government agencies and their decisions go unchallenged by movement protagonists.

The health care industry accounts for 14 percent of the Gross Domestic Product (GDP) (Levin 2006). Construction accounts for another 14.2 percent of the GDP (USGBC 2007). The ability for these industries to influence and transform the market functions as an important similarity between green building and health care. However, there is an important distinction: green building is client-driven in a way that health care is not. In the building trade, clients specify whether they will avoid vinyl windows, whereas in health care, the choice of using a PVC/DEHP free IV bag is not left to the patient to decide. In this way, health care professionals may have more control over the use of PVC in their industry. They do not need to convince clients that PVC avoidance is a wise choice for the environment and human health. However, control over product use

⁵ Rose (1997) is referring specifically to New Social Movements. While I have argued that the anti-PVC movement should not be considered a NSM, I believe Rose’s observation still applies.

and purchasing decisions may be impacted by power differences within the hierarchy of the health care system as well as the bureaucratic or organizational structure of the health care system more generally. Many interviewees mentioned long-term contracts with suppliers or group purchasing organizations as a primary challenge to implementing PVC phase-outs in health care settings.

Variations in the scale of the organizations involved is a fundamental difference between the two branches of the movement. Size matters not only with regard to purchasing power as evidenced by economically powerful health care systems like Catholic Healthcare West and Kaiser Permanente, but also with regard to the framing process and how an organization diagnoses the problems with PVC, frames the solutions, and mobilizes constituents. There is no large-scale equivalent of Health Care Without Harm in the green building industry that has taken an explicit position on PVC phase-out and elimination. Besides the USGBC, there is no central body organizing and motivating green builders. The influence of the USGBC should not be understated; however, as indicated elsewhere the USGBC holds the unique position of being both a part of and a target of the green movement, particularly with regards to PVC. Greenbuilders are represented by professional associations such as Architects, Designers, Planners for Social Responsibility (ADPSR). These groups may attend conferences such as the USGBC's Greenbuild conference, and may manage online forums, but these organizations and events are not social movement campaigns. As a network, the Healthy Building Network serves to bring together likeminded architects, designers, and green building specialists. But their focus is also predominately on market transformation rather than on education or recruitment. Structurally, their small core staff is divided between working on policy issues or working on various political and environmental campaigns. U.S. green building chapters, of which there are over fifty, and regional and local ecobuilding guilds, provide the most direct route for individual builders to get involved in the movement, although many of these groups do not explicitly engage in the PVC debates.

Health care and green building are characterized by different types of interaction within and between organizations. During construction projects, particularly those that are LEED certified and require integrated design, green builders, contractors, and architects work together. However, unlike the health care industry, this interaction is not sustained on a day-to-day basis. In health care, workers experience constant interaction with other professionals. These ongoing relationships may facilitate mobilization or at least discussion about PVC or other health care related environmental health issues. Additionally, whereas the United American Nurses have partnered with Health Care Without Harm, there are no organized labor unions involved in the green building branch of the movement.

Organizational structure may either expedite or inhibit action or dissemination of information on PVC. Unless PVC is an organization's primary environmental health concern, movement members and leaders must reprioritize their organization's agenda to incorporate PVC concerns. While large organizations often benefit from greater resources and strength, the leaders of smaller organization must strategize to effectively educate their members. For example, the UAN, ANA, and IAFF all hold yearly conventions attended by delegates representing different associations and local unions; however, interviewees from all three groups recognized problems communicating convention findings back to members.

As bureaucratic institutions, health care systems are characterized by compartmentalization. Communication across departments is limited, or occurs only via managerial administrators. As mentioned, compared with the green building industry, there is a greater acknowledgement of 'champions' in the health care branch of the anti-PVC movement. However, unless environmental health advocates are openly encouraged and recruited, many times if a 'champion' emerges, their activism is contained within their unit. As one nurse commented, "You just have to have somebody designated, or somebody's whose job it is to make the effort to do it because everybody's just so busy running their own little silo, that they don't really look at the big picture" (interview, McNeil).

Several interviewees representing both health care and green building movements expressed concern or at least awareness of the differential health impacts that exist as a result of exposure to PVC, particularly citing environmental justice concerns. Only the United American Nurses and the International Fire Fighters Association mentioned worker and labor concerns as primary reasons for opposing PVC. Few other interviewees spoke beyond generalities when it came to worker issues. For example, I was somewhat surprised that none of my interviewees mentioned a 2004 explosion at a plastics manufacturer in Illinois that killed five people and injured three. However, I do not interpret this as a lack of concern or even awareness regarding worker's issues, but as a lack of prioritization in frame construction. In the literature (reports, position papers, etc.) of green building and environmental health advocacy organizations worker and community health concerns are addressed, as are the socioeconomic implications of a PVC phase-out.⁶

Activists in the health care and green building branches of the movement are what McCarthy and Zald (1977) term 'conscience adherents.' They do not stand to benefit directly if the movement's objectives are obtained (McAdam and Snow 1997). In general, neither branch of the movement has a direct relationship with the means of production. They are not manufacturers, but rather they are users of PVC products. Movement protagonists are not dependent upon production or disposal industries for their material well-being and are thus in a position to demand regulatory, technological, or production changes with minimal risk. Their professional status affords them credibility, legitimacy, and authority—characteristics that have proven to play a significant role in the movement. However, as discussed elsewhere in this dissertation, political and economic challenges vary across the various branches of the movement, but overall, health care protagonists are more engaged with regulatory and legislative debates than the green builders.

⁶ I also suspect that even though I explicitly asked interviewees what concerned them about PVC, they nonetheless curtailed their responses to reflect their assumptions that I was familiar with the environmental and health problems associated with PVC.

The Vinyl Institute and Opponents

“Why do all these people hate us?”
Vinyl Industry Representative

The countermobilization efforts of the plastic and chemical industries are frequently similar with regard to different SMOs and interest groups in both the health care and green building industries of the anti-PVC movement. As introduced in chapter three, the five counter strategies used to target the movement include; counterrhetorics, non-problematizing, scientific arguments, credibility strategies, and direct action strategies. This section expands on these strategies in order to compare tactics directed at the health care and green building industries. I also introduce a new counter strategy, cooptation, and describe its use by the vinyl and chemical industries.

In our first interview, when I asked Edward Benson, the vinyl industry representative, who the industry’s major opponents were, he first listed competitors, specific companies. I responded, ‘No, not competitors. Opposition,’ to which he replied, “Oh, you mean, ‘attackers.’” The ‘attackers’ included: Health Care Without Harm, the Healthy Building Network, the Oregon Toxics Alliance, the Washington Toxics Coalition, Public Interest Research Group, the Center for Health and Environmental Justice, the Ecology Center, Citizen’s Environmental Coalition, and Greenpeace, who he says, “Wrote the book and everyone else picked up on that.” Throughout the interview, negative references were also made to Gerald Markowitz and David Rosner, “professional witnesses for plaintiffs,” Lois Gibbs, who was “obsessed with dioxin ever since Love Canal”, Bill Walsh, the founder and coordinator of the Healthy Building Network, and Mike Schade, the Center for Health and Environmental Justice PVC campaign coordinator. On the other hand, Judith Helfand, the co-director of *Blue Vinyl*, was regarded in very friendly terms. Although Helfand’s film, the point of which Benson views as “to say, the vinyl industry says it has changed its ways, but it hasn’t,” was not received so favorably.

Benson, himself, is quite friendly. Having initially presumed that access to the vinyl industry would be difficult to obtain, I was surprised that of all my interviewees,

'Edward Benson' was the most prompt in returning emails and phone calls. Several trade associations are connected with vinyl production, including the American Chemistry Council, the Chlorine Institute, and the Vinyl Institute. Further, all are housed in the same tall, concrete, glass, and steel building on a main street in Arlington, Virginia. Given that only one person responded to my letters and emails, I had my suspicions that Benson was elected to represent them all. Or, as one interviewee observed, "A lot of these trade institutes are one and the same." Benson is a white, middle-aged, fit, amiable man. Given easily to talking, he has a knack for providing lengthy, if superfluous, responses to questions as well as shrewdly rephrasing questions as ones he would prefer to answer, often employing both skills simultaneously.

The floors housing the vinyl industry trade associations are not accessible to the general public. Prior to my interview, Benson had given me his cell phone number, recommending I call him as I approach the building so he could meet me and take me directly to his office. I was unable to reach him so instead took the elevator to the 15th floor reception area. I signed in, noticing the majority of other visitors indicated the reason they were visiting was because they were with chemical companies. After some confusion, I was ultimately led to Benson's office where I was introduced to Ellen (pseudonym) and told she would be sitting in on the meeting, but was never informed as to why. There was a nice view of the Potomac River and the Pentagon from the window, which I was told made for a striking and memorable viewing on September 11th. While there, I was struck by the juxtaposition of the clean and sanitary offices and my knowledge of the hazardous wastes and pollutants of PVC's lifecycle.

I had a difficult time accepting Benson's portrayal of the vinyl industry as a victim, although I certainly believed that the attacks against the industry are impassioned and unrelenting. Benson indicated that the industry would work with the opposition if they could, an overture easy to make when he is aware it would not be accepted. In spite of his cooperative suggestion however, many movement organizations have been targeted by the vinyl industry. Their experiences with backlash vary by organization. At times

the industry will confront challengers directly, but more often than not, it will use a third party, as it did with Philip Scranton and his attack on Markowitz and Rosner.

Greenpeace is the industry's original nemesis, and by extension, the Healthy Building Network, which was started by former Greenpeace researcher Bill Walsh, and is aided by other Greenpeace members. Moreover, as one of the self-described opinion leaders in the green building movement, the Vinyl Institute's view of the Healthy Building Network seems the most adversarial. Like Greenpeace's early 1990s focus on all organochlorines, the Healthy Building Network is also concerned with an entire class of chemicals: halogens. As Walsh explains,

When you think of the kind of headline chemicals of your lifetime that you can roll off the tip of your tongue that are bad: DDT, CFCs, dioxin, agent orange, if you talk about the sites you've heard of just in your lifetime randomly: Love Canal, Times Beach, Missouri – these are all involved with halogenated chemicals. DDT, PCBs, CFCs, they are all halogenated chemicals that are linking chlorine with other organic chemicals.

Walsh adds, "We didn't just throw a dart at the board and hit PVC." Referring to persistent organic pollutants (POPs), Bill Walsh says, "where we differ with the industry is that we favor elimination and they favor control of the chemicals. That's what we're fighting about – elimination or control."

One of the industry's more controversial cheerleaders is Patrick Moore, former Greenpeace activist, and now consultant for various industries through Greenspirit Strategies Ltd., his public relations company. Moore touts his position as a Greenpeace founder, (a fact denied by many in the movement) and experience as an environmental activist in order to legitimize his position as a critic of the organization's current activities. Moore argues:

At the same time that business and government are embracing public participation and inclusiveness, many environmentalists are showing signs of elitism, left-wingism, and downright eco-fascism. The once politically centrist, science-based vision of environmentalism has been largely replaced with extremist rhetoric. Science and logic have been abandoned and the movement is often used to promote other causes such as class struggle and anti-corporatism.

Moore appears in videos for the Vinyl Institute, publishes opinion pieces on industry's behalf, and speaks at their conferences. Critics point out that while "he trades on his history" with Greenpeace, he is not forthcoming about his role as a paid industry

consultant (Environmental Health Fund 2007). On vinyl he contends, “There is not a shred of evidence that vinyl damages human health or the environment...banning vinyl would further raise the cost of an already struggling health care system, ultimately denying health care to those who can least afford it” (www.greenspirit.com).

Moore uses a combination of counter strategies to attack PVC opponents. He routinely uses the counterrhetoric of insincerity (Ibarra and Kitsuse 1993) to accuse opponents of acting in ways to benefit their own self-interest. For example, following the Center for Health, Environment, and Justice’s National Day of Action (May 24, 2007) urging the department store Target to phase out PVC in their products and packaging, Moore stated that the actions “reflect the protesters’ political and ideological agenda, not genuine health or environmental concerns” (www.vinylinfo.org). Greenpeace receives the brunt of Moore’s criticism. Following a July 2007 article, “Electronic makers break out ‘green’ initiatives” in *USA Today*, Moore submitted a letter to the newspaper which read in part, “Electronics manufacturers appear to be blindly following the Greenpeace political agenda, an agenda devoid of any scientific basis that will result in more expensive, less climate-friendly products whose health and environmental risks are unknown” (www.vinylnewsservice.net). Benson asserts that the anti-PVC movement is a political campaign aimed at bringing down the chemical industry as we know it. Moore and the vinyl industry commonly use this counterrhetoric not only to dismiss opponents, but also to reframe protagonists’ calls for market transformation. By reframing opponent’s tactics as intentions to ‘bring down industry’ they avoid addressing the actual environmental and health charges made by opponents. Deflection is at the heart of vinyl industry strategies. As long as attention is drawn away from the industry, the veracity of their claims does not matter.

Moore is just one example of how industry uses third parties to criticize movement protagonists. The use of third parties can also be exemplified by Doug Bandow, a former lobbyist and libertarian thinker. In the fall of 2003, Bandow wrote a series of articles for the Action Institute, in which he asked, “Health Care Without Harm, or harming health care?” The Acton Institute is a libertarian think tank “integrating

Judeo-Christian truths with free market principles” (www.acton.org). Bandow (2003) extols the benefits of vinyl in medicine, while condemning HCWH and Greenpeace to a lesser degree. He emphasizes the prominent role religious organizations play in HCWH, but asserts that these groups are confusing ideology with theology. While he conveys a sense of understanding why religious organizations become involved, he nonetheless argues that by partnering with secular environmental groups they are violating the Judeo-Christian moral tradition of being stewards of creation. Because “the use of PVC plastics in medical care hardly seems to be a religious issue,” he implies that religious groups have been exploited to provide “moral legitimacy” to HCWH (Bandow 2003:1, 6). Bandow (2003:2) also uses scare tactics when he says “eliminating PVC...could have the effect of sacrificing patient care” which also serves as another form of reframing PVC as a public good. Like Edward Benson, C. Everett Koop, Patrick Moore, and others, Bandow denounces movement protagonists by claiming they are only promoting political ideology. Somewhat surprisingly, Bandow references the 1999 Koop led American Council on Science and Health as support for the safety of DEHP, even though Koop’s credibility was later called into question. He also cites the controversial IARC downgrading of DEHP from a possible carcinogen to being ‘not classifiable’ as to carcinogenicity to humans.

When the subject of Bandow came up in my interview with Benson, we were at his desk, facing the Pentagon out the window. Benson was facing away from me when I asked him if his organization had a relationship with Doug Bandow when he wrote the Acton Report articles. He asked if I had read them, to which I replied. “Yes.” He acknowledged that they did have a relationship with him, but qualified his response with, “Well, we gave him some information.” Ironically, Bandow, like Koop, was discredited professionally following his publicized support for the vinyl industry. Bandow resigned as a senior fellow from the Cato Institute after admitting that he had taken payments for writing between 12 and 24 columns that were favorable to the clients of the indicted lobbyist Jack Abramoff. Whether Bandow had a similar relationship with the Vinyl Institute is only speculation.

Whether or not Bandow, Moore, or others are experts depends on the perceived legitimacy of one's 'expert status' as it is shaped by credibility, authority, and trust. Protagonists in both the health care and green building industries face credibility challenges from the plastics and chemical industries. Attempts to refute scientific arguments are embedded within claims of ethical violations. In his evaluation of Markowitz and Rosner's work, Philip Scranton suggests that a researcher is unable to be both an advocate and simultaneously produce legitimate, quality research. He argues that it is the "historian's duty to see 'objective truth'" (2004:34). Similarly, in comments submitted on behalf of the Phthalate Esters Panel of the American Chemistry Council to the PVC Task Group, Courtney Price, Vice-President of Chemstar, calls for TSAC (Technical and Scientific Advisory Committee) to exclude reports on phthalates that "have been produced by individuals or groups with a stated position on PVC and/or phthalates" (2004:4). In part, Price (2004) argues, they "may provide interpretations that do not reflect the scientific consensus" (p. 4). In our interview, Benson commented that most people question industry research. He asked, "Who believes data from industry?" recognizing that it is often discounted as potentially biased, but nevertheless contending that it is still accurate.

The vinyl and chemical industries use 'cooptation' as a countermobilization strategy to redirect attention away from the problematizing of PVC by movement adherents. Akin to 'greenwashing,' cooptation is a deliberately misleading tactic intended to confuse or convince movement members, targets, or potential constituents of a false claim or of the inaccuracy of a claim of movement activists. In several instances, the PVC industry has used the Internet as a mechanism of cooptation. Domain names have been co-opted and keyword searches lead to sites that are unlikely to be the intended destination of the user. For example, Joe Thornton, author of *Pandora's Poison* is not the owner of the domain names www.pandoraspoison.com, www.pandoraspoison.net, and www.pandoraspoison.org. All three sites are owned by the chemical and plastics trade associations. Similarly, if interested in learning more about the film *Blue Vinyl*, a web surfer may inadvertently be led to www.aboutbluevinyl.org, a Vinyl Institute website

designed to debunk the Judith Helfand and Daniel B. Gold film about Helfand's quest to convince her parents not to use vinyl siding on their Long Island home. Similarly, the plastics and chemical industries create websites designed to educate or inform readers and web browsers on green building. If searching for "green building solutions" browsers will discover an American Chemistry Council (ACC) site, www.greenbuildingsolutions.org. Eleven design elements of green building are listed, only one of which does not praise, recommend, or provide a link to vinyl websites.⁷ While the American Chemistry Council's logo is visible at the bottom of the screen, the resource materials on 'green' building are intended to educate the visitor, but are embedded within a strong, ideological stance (see Hara and Estrada 2005).

In addition to becoming members of existing organizations, such as the USGBC, the plastics and chemical industries create their own greenwashed organizations. For example, the Nurses Leadership Council is framed as an "independent body of nurse scholars," and serve as advisors to the Chlorine Chemistry Council. Marian Condon with ANA remembers:

They came from the trade association and they approached these nurses. These nurses had no background in environmental health. They didn't have any background in public health. They didn't have any toxicology background. I mean they were very nice women and they were very credentialed and successful, but they were not experts in this field. They were coming out with different reports on things that the vinyl industry wanted them to make comments on.

In green building, the plastics industry and associated trade organizations created the North American Coalition on Green Building. This followed the USGBC's initial decision in 2004 to not allow trade associations to become full members. In a 2005 statement, The North American Coalition on Green Building contended, "The USGBC process to develop LEED is neither consensus-based nor grounded in objective, scientific criteria" (2005). In a letter to President Rick Fredizzi, the USGBC Board Members and TSAC, the Cascadia Chapter of the USGBC, criticized the Vinyl Institute and other trade organizations for co-opting the "good name of green building" through the North American Coalition on Green Building. The Cascadia Chapter claimed that this activity

⁷ The exception is 'foundation.' The other design elements are electrical, plumbing, flooring, insulation, wall coverings, windows, siding, acoustics, doors, and finishing.

is “clearly adversarial and should be addressed immediately by the USGBC Board of Directors” (2005). The purpose of front groups like the Nurses Leadership Council and the North American Coalition on Green Building is the familiar tactic of using ‘credentialed,’ ‘independent,’ or ‘objective’ organizations to enhance the legitimacy of the industry’s arguments. Similarly, industry hires third party research foundations to provide supportive documentation.⁸

On their own, none of these tactics seem particularly harmful. However, they are demonstrative of a pattern of attempts to control the discourse, mislead the public, promulgate misinformation, and create doubt in the minds of potential movement constituents. Benson told me they did not follow the actions of their opponents, but yet he was able to immediately reach into the top drawer of his desk and pull out the Center for Health, Environment and Justice’s report, “Bad News Comes in 3’s.” Without a doubt, the vinyl industry is very attentive to the actions and strategies of the anti-PVC movement. Many well-known companies are in the process or have already phased out PVC from their product lines or packaging. Some of these have done so quietly, others, such as Shaw Industries, Ikea, Carnegie Fabrics, Nike, and Apple, are more vocal in their decisions. Benson points out however, that many of these companies are not replacing PVC products with characteristics unique to vinyl but de-selecting PVC packaging. Nonetheless, the movement is having an impact.

In 2003, Monique Harden and Nathalie Walker, attorneys and co-directors of Advocates for Environmental Human Rights, summarized their experiences as attendees at an American Chemistry Council (ACC) conference, “Communicating in a Volatile World,” for *Rachel’s Environment and Health News*. They reported that the ACC conceded that environmental health activists were having success in raising public awareness on toxic chemicals, attributing this success to the diversity of members in coalitions such as HCWH. This article functioned to impart a sense of efficacy to movement participants; but also served to pass on specific details regarding the chemical industry’s communication strategies and concerns. According to Harden and Walker

⁸ As indicated in chapter three, at times these ‘third parties’ are university researchers funded by corporate interests.

(2003), among the ACC fears were: information linking toxic chemicals and human health, use of the internet by activists to spread awareness of the health impacts of chemicals, the use of “value-based” messaging by activists, and the precautionary principle. In terms of strategies, the ACC recommended finding a ‘credible and comforting’ person to drive the chemical industry message in response to environmental health issues and to avoid defensiveness in public settings because it angers people and conveys coldness and lack of emotion. Clearly, the industry is fighting back using the aforementioned strategies.

Directions for the Future

Frame Bridging and Continuing the Coalition Model

Benson and Snow (2000) define frame bridging as “the linking of two or more ideological congruent but structurally unconnected frames regarding a particular issue or problem” (p. 624). Both the health care and green building branches of the movement emphasize lifecycle concerns, although health care activists are more likely to frame concerns around PVC’s use stage, whereas those in the green building movement are more likely to focus on end of life concerns. The clear prognoses for both movements is to phase-out and eliminate PVC from their industries. Movement constituents in the health care industry are motivated by their concern for patient health and sense of commitment to ‘do no harm.’ In some ways, green building movement protagonists are similarly motivated, although in health care, the move to act may be more closely tied with strategic framing on behalf of movement adherents. Interviewees from health care pointed out that people tend to enter the profession because they want to be healers; they want to help. Likewise, many builders, architects, or designers in the construction and design industry chose to become ‘green’ builders through their own commitment to find a way to link their values with their profession.

Both branches of the movement tend to see themselves as successful where other environmental movements have not been. Michelle Moore explains, “the environmental community as an activist group has often been aimed...it’s been against stuff, you know,

it's been aimed at regulations, activities that prevent harm, instead of promoting good.” Stacy Malkan of Health Care Without Harm describes their approach:

I do think that HCWH is sort of a new way of environmental organizing – that partners with industry to make a change. And that's the idea behind what we are doing, we're partnering with the health care industry, and at times [we've] been on the outside protesting to the hospitals. But more often, we've found ways to work together with them. And bring a diverse range of people to the table and look at a problem from all different aspects. I think that's been another key to our success. So that when we're working on the PVC problem, we talk to people in healthcare using the products, the group purchasing organizations that are putting in contracts, with manufacturers that are making it, the scientists who know about the problems with the chemicals, and the people who can do the research on the alternatives.

Some of the more notable success stories have emerged from collaborative efforts from core and semi-peripheral organizations. This is true not only for PVC phase-outs, but for the sustainable healthcare movement more broadly, as evidenced through the mobilizations of peripheral groups by Health Care Without Harm, American Nurses Association, and H2E. Moreover, ongoing efforts bridging the concerns of nurses, patients, the environment and human health signify the importance of simultaneous promotion of occupational health and pollution prevention for the movement. Within the health care branch, an increasing reliance on labor union partnerships should be certain to harness the energy and strength of state and local affiliates. On the other hand, the green building movement's inattention to labor concerns must be addressed to successfully bridge public, environment, and worker health frames.

A devoted coalition of U.S. and international unions, public health agencies and advocates, and other environmental organizations would be able to tap into labor issues as well as environmental health issues on a larger scale, reflecting the far-reaching effects of PVC environmental and health problems. As an international coalition, HCWH is especially well-positioned to work with other non-governmental organizations. While this dissertation has not focused on PVC politicization internationally, PVC activists would do well to pay attention to the global market. A recent report, “PVC in China 2006-2010” advises that, “PVC players in all regions should have a thorough understanding of the dynamics of the Chinese market and its implications for them” (Harriman Chemsult Limited 2007). China has the highest rates of growth in PVC

supply and demand, but seeks self-sufficiency in PVC production, a goal it will likely accomplish by 2010 (Harriman Chemsult Limited 2007). Activists and public health advocates are well aware of the boundary-less properties of PVC's lifecycle impacts. Dioxins are especially problematic because of their "global migratory nature" (Emmanuel et al. 2005) and what is produced in China will not 'stay' in China, as it hasn't 'stayed' in the Gulf Coast of the United States. To recapitulate one of Barry Commoner's four laws of ecology, "everything must go somewhere." China's growth poses additional environmental and health problems. Moreover, unlike U.S. PVC producers, China uses coal rather than ethylene as a feedstock (Esposito 2007).

The consensus based decision-making model used by the USGBC is vulnerable to abuse by organizations and interest groups with the greatest economic and political power. Democratic and transparent policy making demands that the USGBC, or any organization or coalition using CBDM, explicitly acknowledge the potential for coercion or disproportional input and influence among member organizations. This expectation includes that industry is challenged on its rhetoric of 'fair play,' casting themselves as victims of an unscientific or speculative precautionary approach. Adherence to the CBDM as a measure of organizational success should not replace sound environmental and health decisions. A 'model' for decision-making that has become routinized is likely to conceal extra-organizational activities that are intended to more subtly influence the organization.

Some aspects of the healthcare system are clearly becoming greener and more environmentally aware. At the same time, the healthcare industry is booming. New hospitals and health care facilities are being built each year, patient population is increasing (particularly as baby boomers age), and there is an increasing reliance on pharmaceuticals to treat a wider range of conditions. This economic growth is accompanied by a rise in associated ecological problems—such as habitat destruction due to new construction or pharmaceutical contamination of waterways—in addition to the environmental health problems that may be associated with medical practices and technology, including PVC/DEHP.

The movement does not involve changes to our nation's approach to health, healing, or the health care system. The efforts undertaken by such groups as Health Care Without Harm are to be commended for creating a green shift within the healthcare industry. However, less focus and certainly less media coverage is given by national organizations to addressing environmentally-induced and contested health problems as well as overall implications of the biomedical model for environmental health. Our nation's health care system revolves around treatment of diseases. The system's approach to prevention is individualized and tends to emphasize behavioral changes such as smoking cessation or weight loss rather than focusing on structural problems such as polluting facilities or ambient air quality. As an example, the former slogan for the Komen's foundation "Race for the Cure" is "prevention is the best cure", while the slogan is now "detection is the best cure." As nationally known epidemiologist Devra Davis has stated, "...no matter how efficient the health care system becomes at finding and treating disease, if we don't reduce the burden of the disease itself, we'll never be able to improve the health of Americans" (Murray 2007:2).

Concluding Thoughts

Even though I have considerable concerns about the anti-PVC movement's inattention to structural reform of the health care and building industries, I still find the movement to be incredibly successful. Activists, green builders and healthcare professionals, and environmental health advocates cannot be expected to radically transform the green building and health care industries through one social movement. The task is formidable. Moreover, much of their success arises from clearly articulated and defined objectives and through successful diagnostic, prognostic, and motivational framing of their concerns to meet these goals. In interviews, movement protagonists acknowledged nominal public knowledge regarding the lifecycle threats of PVC. The ubiquity of PVC and the toxic threats it poses should help convince activists of the importance of movement expansion. The coalition approach should help facilitate efforts to increase public awareness.

I also suggest movement protagonists more systematically consider classes of chemicals as their focus. The influence of Greenpeace's chlorine chemistry campaign continues to resonate in today's movement. The persistent attacks on the organization by the vinyl industry and its supporters should serve as an indication of the threat the goals of this campaign posed to the industry. The movement could expand its reach and impact by partnering with workers across industries. In particular, the toy, auto, and electronic industries are also significant users of PVC. By expanding their coalition to include toy safety advocates, the movement would be able to extend its children's health frame as more parents become interested and involved in the movement. I recommend that the movement more proactively seek a building materials company to step up and take a leadership role in providing PVC free alternative products. The green building branch of the movement has more strength and economic influence to encourage or pressure manufacturers than it is using.

Many additional questions emerge from this research. Suggestions for further research in this area include; an investigation of the role and experiences of health care providers as environmental health activists, a broader analysis of the health care industry's sustainability efforts, and an examination of the activism of professionals as conscience adherents in occupationally-driven movements. In particular, this research contributes to the literature on the politicization of toxics. It points to the importance of examining environmentally-contested illnesses and health problems from an intersectional approach linking the sociology of health, social movements, and environmental sociology.

APPENDIX A

METHODS

This dissertation relies on the complimentary use of documentary research and in-depth interviews with a non-probability sample of representatives of organizations involved in anti-PVC campaigns and the politicization of PVC. Documentary research was used to uncover and examine the written accounts of the socio-political history of PVC, the current debates surrounding PVC use, and the positions, objectives, and actions of stakeholders. This included: scientific reports, government documents, research studies, books, papers, articles and the websites, press releases, newsletters, and position papers of various organizations. Twenty in-depth interviews were conducted lasting approximately forty-five minutes to one hour and forty-five minutes. Two partial interviews lasting from approximately twelve minutes to twenty-five minutes were conducted. Of the in-depth interviews, four involved follow-up interviews lasting from approximately twenty-five minutes to an hour. The data gathered from the in-depth interviews as well as attendance at several green building seminars was used to compliment the documentary research.

This research began by conducting a broad-based internet search using multiple combinations of the keywords aimed at finding the websites¹ and organizations devoted to PVC activism and concerns, or representing the interests of the vinyl industry. In order to develop a comprehensive social, health, and environmental understanding of the issues surrounding PVC, I performed similar searches within multiple academic databases including: Alt HealthWatch, Alternative Press Index, Lexis-Nexis Academic, Medline, PubMed, Academic Search Premier, ArticleFirst, BuildingGreen Suite, Web of Science, Health Source (Nursing/Academic Edition and Consumer Edition), Goggle

¹ Not all websites are connected to a particular organization. For example, the website www.myhouseisyourhouse.org is sponsored by the creators of the film *Blue Vinyl*. The site contains information on PVC and how to join the movement to phase-out PVC, but there is no specific organization called "My House is Your House."

Scholar, Hazardous Substances Database, JSTOR, Newspaper Source, Sociological Abstracts, and ToxNet.

From these searches, I was able to create a list of the major and minor stakeholders and activists involved in the PVC debates. I determined that there are essentially three categories of organizations and websites related to the debates surrounding PVC. To borrow terms from world systems theory, these categories can be referred to as the core, semi-periphery, and periphery. The core of the movement includes those organizations that are actively engaged in the debates. Generally these groups are national in scope and can be considered activist or advocacy oriented organizations (Health Care Without Harm, Greenpeace, Healthy Building Network, and Center for Health, Environment, and Justice). The core also includes the Vinyl Institute, the major trade association representing the vinyl industry. The core advocacy organizations, or movement adherents, are involved in current PVC campaigns and include those organizations specifically identified by other core-identified organizations. Large, health care providers (specifically, Kaiser Permanente and Catholic Healthcare West) phasing out or eliminating PVC in their own facilities either in medical supplies or building materials are regarded as core members for their market influence. Although the U.S. Green Building Council has not taken a position on PVC, the organization's visible and ongoing engagement with the debates through evaluation and consideration of a PVC avoidance credit for its green building rating system (LEED) and the centrality of the organization to the green building movement establishes it as a core organization.

The semi periphery comprises the largest category. On the pro-PVC end, the semi-periphery includes chemical and plastics trade associations that are closely allied with the Vinyl Institute. On the advocacy arm, the semi-periphery includes those organizations that are participants in the movement and may influence it or help educate others, but not as directly involved themselves. This includes national, regional, state, and local organizations whose anti-PVC campaigns are no longer active in addition to some non-national organizations who *are* engaged in current campaigns, but whose involvement either stems significantly from their status as coalition members of national

(core) organizations or their campaigns are relatively dormant. The semi-periphery includes unions and similar organizations that are actively engaged in educating members, but has not prioritized PVC phase-outs or elimination as primary objective of the organization. Organizations, medical societies, and businesses that have explicitly taken a position on PVC, such as passing a resolution calling for its phase-out are situated in the semi-periphery. Those medical suppliers that have launched and promoted PVC-free medical supply lines (particularly IV bags) and work with either others semi-periphery or even core organizations are also included in this category.

Finally, the periphery includes those organizations whose involvement is quite limited or intermittent. This may include organizations that provide links to core or semi-peripheral organizations on their websites, or, for example, a pediatric health page directed at parents with an information link regarding PVC in toys. The activities of organizations in this category are generally less political or controversial in nature. Because the organizations in the periphery are not active or central to the politicization of PVC they are generally omitted from this study. However, their significance is not dismissed; awareness of peripheral organizations furthers understanding of how widespread recognition and coverage of PVC health and environmental concerns has become.

As part of my efforts to understand and follow the debates surrounding PVC, I regularly checked the Vinyl News Service, Environmental Building News, Environmental Health News, and the websites of Health Care Without Harm, U.S. Green Building Council websites, in addition to conducting news article searches in Lexis-Nexis. I subscribed to and read either the online or print versions of newsletters for the Healthy Building Network (“Healthy Building News”), Center for Health, Environment and Justice (“Everyone’s Backyard”), the Green Guide for Health Care, Cascadia Chapter of the USGBC, the USGBC’s Technical and Scientific Advisory Committee PVC Issue Announcement List, Hospitals for a Healthy Environment (H2E), the Oregon Center for Environmental Health, The Center for Health Design, and Rachel’s News. I joined and for a year monitored the listserv of H2E for comments, questions, or discussions related

to PVC, DEHP, and other relevant and related topics. Several times a month, sometimes less often if an organization rarely updated its website, I would survey the websites of organizations located in the semi-periphery. Although, I conducted a less systematic examination of specific periphery organizations, any pertinent information was discovered during my regular website activity. Whenever a substantial report, news article, PVC action, or significant decision made regarding PVC (e.g. a business decides to phase-out PVC, a healthcare company awards a medical supply contract to a non-PVC manufacturer, etc.), I would survey the core and most involved semi-periphery organizations websites for reactions and interpretations of the report, news item, event, or decision. I also paid attention to more mainstream media coverage of PVC issues (as well as environmental health concerns more broadly) as they appeared in newspapers, general-interest magazines, radio programs (specifically NPR), and television news programs.

To build on, as well as compare with information gathered from print and internet sources, I conducted a series of interviews with representatives of all the organizations in the core and some in the semi-periphery. A variety of means were used to obtain interviews, with potential interviewees selected through a combination of snowball and purposive sampling. Due to the geographical locations of key activists and stakeholders, the majority of my interviewees were first contacted by letter and followed-up by a telephone call. A few situations required extreme persistence, with one interview in particular taking eight months and over fifteen emails and phone calls to secure. Other potential interviewees failed to respond after multiple attempts at contact and were consequently not included in this study. At minimum, I attempted to contact interviewees three times.

Interviews were voluntary, semi-structured, open-ended, and confidentiality was offered to all respondents. Because I wished to be able to link interviewees with their responses and respective organizations, I asked each interviewee if they would consent to waive confidentiality. The majority of subjects interviewed were already public figures who readily provide information or statements to journalists, on websites and newsletters,

and other public records. Moreover, my interest was on organizational PVC concerns and strategies, rather than personal information. All interviewees, with the exception of the representatives from the vinyl industry, consented to waiving confidentiality. Although, several representatives from medical supply companies requested that if I quote them directly that they be able to review my dissertation before I submit my completed work. Rather than relinquish control, I opted to use pseudonyms for these individuals.

Interviews were geared toward discovering how stakeholders work to politicize and remedy the problems associated with continued PVC use, or contrarily to discover the perspectives of PVC proponents and how they engage with these debates. The interviews covered areas related to specific concerns regarding the framing of PVC concerns, organizational structure and activism (including objectives, strategies, perceived solutions, coalition formation, etc.), influence (or perceived influence) on corporate decision-making and government policy, barriers to success, and environmental and occupational health training if appropriate (see Appendix B for a sample interview guide). I adjusted each interview guide to accurately reflect the type of organization (i.e. business, union, environmental health organization) that the interviewee represented.

Due to the national scope of the anti-PVC movement, the majority of interviewees were not accessible locally. While conducting interviews via the telephone is not ideal (recording can be of variable quality, establishing rapport may be difficult), time and financial constraints necessitated that thirteen of the interviews be conducted on the phone. Three interviews were conducted face-to-face in the Washington D.C. area at the interviewees' respective organizational offices, while the rest of the interviews were conducted face-to-face in the Eugene area. The face-to-face interviews were conducted at locations selected by the interviewees. In two interviews, I benefited from having several organization representatives present. The majority of subjects granted permission to digitally record the interviews (again, with the exception of the representatives of the vinyl industry and several interviewees within medical supply companies). The

interviews were then downloaded onto my password-protected computer and subsequently transcribed and coded.

There are some methodological limits to this research project. Because of the broad spectrum of this project, I was not able to conduct an exhaustive study of my subject population. As mentioned, time and financial constraints also limited how and where I was able to conduct interviews. I suspect that in some cases, the inability to establish face-to-face contact likely contributed to my response rate and perhaps the willingness of activists or organizational representatives to engage with me in a less informal manner. Unable to use gestures or other non-verbal cues, telephone interviews limited my ability to redirect the interviewee. This was particularly problematic when talking with business representatives who were generally the most reluctant to talk with me and also the most skilled at sidestepping questions. In some cases, the contested status of PVC's use in green building and healthcare was enough in and of itself to cause potential respondents to self-select out of the study. Some potential respondents were quite distrustful of my intentions, with two subjects asking directly if I was funding by the Vinyl Institute. Others, particularly medical supply companies, indicated (sometimes harshly) that they do not talk to researchers.

As mentioned, securing one interview required quite a bit more persistence than the others. I believe this was a direct outcome of the PVC debates in green building, and thus worth describing in more detail. In August 2006, I made my first attempt at contacting the U.S. Green Building Council to set up an interview. At this time, stakeholders were awaiting the USGBC Final PVC Technical and Scientific Advisory Committee (TSAC) report on PVC. The initial draft had been released three years prior, in December 2004. There was much anticipation in both the green building and vinyl industries regarding the outcome. After several tries and misses, but within a week of my first contact, I was given the name of the staff liaison on LEED standards and told he was the lead program manager on credits related to materials. "Perfect!" I thought. However, a week later, I had written in my field notes, "Feel like I am getting the run around." My interview request was transferred to another person, Michelle Moore, the Vice-President

of Communications & Community. Much of this communication occurred via email. Since I was having difficulty connecting with Moore, the person I understood to be interested in or at least willing, to interview with me, I was also communicating, primarily via telephone messages with another person at the Council. I indicated to Moore through both email and voice mail that I would be in the Washington D.C. area in mid-September 2006 and that I hoped to line up an in-person interviews with someone at the USGBC while I was there. However, Ms. Moore did not return any of my messages. Once in D.C., I communicated several times with my first (and up to this point, only) staff contact at the USGBC and although he seemed genuine in his attempts to try to have Moore contact me while I was there, ultimately, I left D.C. disappointed in this regard.

During this time, I continued to conduct other interviews. The expectancy regarding the release of TSAC report was apparent. I suspected Moore was evading me because of the controversy surrounding a possible LEED credit for PVC avoidance, a belief supported by other interviewees. My vinyl industry contact stated that while they awaited the final report, “things are quiet at USGBC”, implying that it did surprise him that I was having difficulty getting in touch with someone at the USGBC to interview. After several months of unreturned messages and emails I finally tried an alternative tactic. I left what I hoped was a polite message indicating that I understood that the PVC issue was a sensitive one, in part because the TSAC report had not been released, but I would still be interested in talking with her about the USGBC and green building in general. I offered to send my interview guide in advance. Still, I received no response. Finally, close to the rescheduled release of the report, I talked with Moore and she agreed to talk with me after the December holidays. Unfortunately, the report’s release was rescheduled yet again. On February 1st 2007, I left a message with three different people at the USGBC (at this point I strongly suspected that my phone number was being screened). Finally, within a week, Ms. Moore answered the phone. She indicated that she would talk to me after the report’s release, either at the end of the month or in the beginning of March. Ultimately, after several more weeks and several more messages and emails, I was able to secure a date and time for an interview.

I may be overreaching in my interpretation of the USGBC's representative's deliberate attempts to avoid talking with me; however, I do believe that her delay in consenting to an interview until after the release of the TSAC PVC report was intentional. To this extent, her action conveys at least a certain element of concern and, certainly, awareness of the significance of the USGBC's final decision over PVC.

Movement Stakeholders:

Core (Organizations are listed alphabetically in each category)

- Catholic Healthcare West – interest group, nonprofit
- Center for Health, Environment and Justice – social movement organization
- Greenpeace – social movement organization
- Healthy Building Network – social movement organization
- Health Care Without Harm – social movement organization
- Kaiser Permanente – interest group, nonprofit
- United States Green Building Council – nonprofit
- Vinyl Institute – trade association

Semi-Peripheral (selective sample, not exhaustive)

- Advocates for Environmental Human Rights
- American Chemistry Council
- American Nurses Association
- American Public Health Association
- American Academy of Pediatrics
- B. Braun
- Center for Environmental Health
- Chlorine Institute
- Ecology Center
- Environmental Working Group
- Global Anti-Incinerator Alliance
- GrassRoots Recycling Network
- Greenpeace
- Hospitals for a Healthy Environment
- Mossville Environmental Action Now (MEAN)
- Oregon Center for Environment Health
- Oregon Toxics Alliance
- Phthalates Esters Panel
- Physicians for Social Responsibility

- Science & Environmental Health Network
- United American Nurses
- United States Green Building Council chapters
- Washington Toxics Coalition

APPENDIX B

IN-DEPTH INTERVIEW OUTLINE¹

Occupation Information:

- Could you tell me a little bit about your current occupation – where you work, what your job entails, how long you’ve been – that sort of thing.
 - Employment at public/private facility – who owns?
- How long have you been employed in this occupation/position?
- Is your workplace unionized? Are you a member of the union?
- How did you decide to become a nurse/physician/green builder/firefighter, etc.?
- How did you get into this field? [What is your related employment history?]

Knowledge of PVC:

- What do you think are the problems with using PVC? Or, how do you interpret the problems of PVC (public health, environmental, occupational, industry, legislative, etc.)?
 - What aspect of PVC is of most concern to you?
- Who is most affected by PVC use?
- How did you first become aware of these problems?
- [If they didn’t mention health] – Are you concerned about illnesses or health problems related to PVC use?
- How familiar (what do you know about) your place of employer/company/work’s position/use on/of PVC?
- How have your views of PVC use changed?

Organization Structure & Activism:

- What organization/coalition are you involved with?
- Describe how you became involved.
 - What do you do within this group?
- What is the overall mission of your group?
- What is the organizational structure of your group?
 - How does this affect decision-making?
- What aspect of PVC is of most concern to your organization?
- Are you familiar with the precautionary principle? Does your organization adhere to the precautionary principle/is this a guiding principle for your organization? How so? How does your organization interpret the precautionary principle?

¹ At this time, the interview outline is primarily written with medical workers in mind.

Objectives:

- What are the objectives for the group?
- Are these the same as the objectives for you?
- If not, what are the differences?
- (If) PVC health concerns are mentioned – what are the specific health concerns? Are they contested – by whom?

Tactics & Strategies:

- What tactics or strategies does the group use to meet its objectives?
- Have the tactics of your group changed to your knowledge?
- Has ____ [the group] had any successes meeting these objectives?
- What are they?
- How were they achieved?
- What strategies or actions are these groups employing to meet these goals or otherwise generate concern and action by others?

Solutions:

- What does your organization see as the solutions?
 - Is this different from the objectives?
 - Is/or how is this different from what you consider to be the solutions?
- Have the expressed solutions changed to your knowledge?

Recruitment:

- Is it important to you/your organization to recruit others?
- Does the group try to recruit others? Who? How so?
- Are you successful in this? Why or why not?

Coalition formation:

- Has your group formed alliances/coalitions with other groups? With which organizations?
- What is the response/reaction of others (outside your profession) with whom you have formed alliances or collaborated regarding your organization's activism?

Influence:

- Is it important to you/your organization to influence others?
- Do you feel that your organization has the ability to influence government policy? How so? What policies are you/have you targeted? Success? How does your

organization (what are the methods/tactics) attempt to influence the policy of government agencies (which agencies?) and legislative decisions? What has been the reaction/response from varying government agencies/officials to your organization's efforts at policy change? How would you describe the interactions between your organization and government agencies/officials or politicians?

- Do you feel that your organization has the ability to influence industry or corporate decision-making/policy? How so? Which companies do you target and why? How does your organization (what are the methods/tactics) attempt to influence different industries (and what industries?) behavior? What has been the reaction/response from varying government agencies/officials to your organization's efforts at policy change? How would you describe the interactions between your organization and industry officials or representatives?
- What is your overall view of industry/government relations?

Obstacles:

- Is there any backlash to your organization's efforts?
- By whom? (Hospital administrators, customers, etc.)
- What obstacles has the group faced? What happened?

Individual Activism:

- Have you ever proposed changes at your worksite that you will think will improve patient safety? Your safety? Customer safety? To whom (were these changes proposed?) What were the changes? Were they implemented? What happened?
- Has your activism "spilled" outside the worksite? How so/in what way(s)?
- Were you/are you involved in other forms activism (prior to the PVC issue)? Briefly describe.

Reasons for Activism (Individual):

- What motivates you? (How do they frame this issue? Justice/human rights/environmental/health/occupation/etc.)

Workplace Experiences:

- Do you feel that your worksite/job is a safe place to work? What is the most dangerous part of your job?
- Regarding your activism/stance on PVC: Do you feel you have support of your co-workers? Managers or other supervisors? Your union?
- What is the response/reaction of others in your profession or workplace to your efforts?
- How do you think they interpret your (or your group's) activism?

Workplace composition:

- Regarding gender: Are most of your coworkers men/women? (What is the gender of the majority of your co-workers?) Does this matter? What about your bosses? Does this matter?

Composition of organization:

- Who is involved in your group? Are there key activists in the group? At your location?
- What is the composition of members/activists within your group? Do you feel this make-up is representative of your occupational sector? How so/how not? Are there varying levels of occupational prestige among members of your organization? Is this significant for the objectives of the group? How so? What about other differences within your organization? Class? Race? Gender?

Prestige & legitimacy:

- Do you feel your organization has legitimacy?
- What strategies is your organization using to lend legitimacy to their claims?
- Does your organization (or a coalition of which it may be a part) engage in your own scientific research? What is the nature of this research?
- Have you ever felt that your occupational prestige has hindered or helped your cause? How so?

Environmental and Occupational Health Training:

- Did you receive any training in environmental and/or occupational health in medical/nursing school? What type of training? Length of training? Did you feel it was sufficient? Why or why not?
- Have you sought out (additional) training or been offered environmental or occupational health training at any place of employment? Please describe this training.

Union Related:

- Please describe your experience with your union (what union?). Are you or have you been a steward or officer in your union?
- How active is your union? Membership rates? Length of workplace unionization?
- Has your union taken a position on PVC? Your local or national?
- Is your union involved in any anti-PVC campaigns? Describe.

Background Information:

Gender:

Age:

Income:

Race/ethnicity:

Concluding questions:

- Is there a question you would be asking if you were doing this study? Is there a topic you think I am missing? Anything else you would like to add?
- Is there anyone you can think of who is active in your organization or a different anti-PVC campaign that may be interested in being interviewed?

Appendix B(1) – In-depth Interview Outline

Specific Questions for green/ecobuilders:

- What is your definition of green or eco-building?
- What are your company's objectives as green builders? Who decides what constitutes "green" building practices? Adherence to LEED?
- Are your own objectives the same? If different, how?
- Is/How is eliminating PVC part of that?
- Why is eliminating PVC in construction important?
- Is this something your clients request or is it something your (your company) suggests? How do you present it to them?
- Are there buildings you design or build that you consider green that use PVC?

For designers/architects:

- Do you use construction companies that also consider themselves "green"? (Do you have control over this?)
- What is the relationship between the architect(s) or engineer(s) and construction company?
- Are the construction companies/workers hired unionized? Is this a consideration in hiring decisions? Have the construction companies you've worked with had varying views or concerns about PVC use? If so, what are they?

Appendix B(2) – In-depth Interview Outline

Specific Questions for fire fighters/first responders:

Union related:

- Question about union activity?

- If your local has not taken a position on PVC, has your national? Vice-versa?

Health Concerns:

- Questions about concern for own health?
- What (if any) training have you received related to PVC exposure?

APPENDIX C

CHRONOLOGY OF EVENTS

- 1974** – American public first learned that four PVC workers exposed to vinyl chloride died from angiosarcoma
- 1988** – Di(2-ethylhexyl) phthalate (DEHP) added to California's Proposition 65 list as a known carcinogen
- 1991** – Greenpeace published *The Product is Poison: The Case for a Chlorine Phase-Out* beginning the debate in North America over chlorine chemistry
- 1992** – *Our Stolen Future* (authors: Dr. Theo Colborn, Dr. J. Peterson Myers, and Diane Dumanowski) published
- 1993** – U.S. Green Building Council founded
- 1996** – U.S. Environmental Protection Agency releases report implicating the incineration of medical waste as the number one source of dioxin in air pollution.
- 1996** – Following the release of this report, 28 environmental and health organizations met at Commonweal (Bollinas, CA) to develop a plan of action. Health Care Without Harm was formed as a response.
- 1996** – *Dying from Dioxin* (author: Lois Gibbs) published
- 1997** – The International Agency of Cancer Researchers declared dioxin a potent carcinogen (February)
- 1998** – December 2, U.S. Consumer Product Safety Commission (CPSC) issued a voluntary ban on young children's teething rings and rattles made of PVC plastic containing phthalates such as DINP
- 1998** – June 24, Hospitals for a Healthy Environment (H2E) launched as a Memorandum of Understanding -- the collaboration of Health Care Without Harm, the American Nursing Association, the Environmental Protection Agency, and the American Hospital Association
- 1999** – American Council on Science and Health
- 2000** – National Toxicology Program, Center for the Evaluation of Risks to Human Reproduction Expert Panel Report on Di(2-ethylhexyl) Phthalate released
- 2000** – U.S. Green Building Council LEED for Commercial Interiors rating system contained draft credit language for the avoidance of PVC
- 2000** – *Pandora's Poison: Chlorine, Health, and a New Environmental Strategy* (author: Joe Thornton) published
- 2000** – May 15, New York state passed a law providing tax credits to owners and tenants of buildings constructed to meet environmentally-beneficial and energy-efficient standards. This law excluded green building tax credits for PVC plastic flooring.
- 2000** – October, Resilient Floor Covering Institute filed a lawsuit challenging New York State's Green Building Tax Credit regulations for excluding vinyl as an approved flooring material.
- 2001** – March 26, *Trade Secrets: A Moyers Report* airs on PBS

- 2001** – U.S. Food and Drug Administration releases “Safety Assessment on Di(2-ethylhexyl) Phthalate (DEHP) Released from PVC Medical Devices”
- 2002** – (January) The American Society for Healthcare Engineering (ASHE) published the Green Healthcare Construction Guidance Statement, the first sustainable design guidance document for the healthcare industry
- 2002** – January 24, Health Canada issued advisory on DEHP in medical devices
- 2002** – *Deceit and Denial: The Deadly Politics of Industrial Pollution* (authors: Gerald Markowitz and David Rosner) published
- 2002** – U.S. Food and Drug Administration releases “Public Health Notification: PVC Devices Containing the Plasticizer DEHP”
- 2002** – Film *Blue Vinyl* (Judith Helfand and Daniel B. Gold) released
- 2003** – ANA adopted the Precautionary Principle
- 2003** – U.S. Consumer Product Safety Commission (CPSC) voted to deny a petition to ban the use of phthalates in PVC toys intended for children age five and younger
- 2003** – May 29, Resilient Floor Coverings Institute withdrew its lawsuit challenging New York State’s Green Building Tax Credit regulations
- 2004** – April 23, Explosion at Formosa Plastics PVC Production facility in Illiopolis, Illinois killing five workers
- 2005** – Green Building Council of Australia offers PVC reduction credits through the Green Star rating system
- 2005** – Baxter loses \$70 million contract with Catholic Healthcare West, CHW awards contract to B. Braun for the supply of PVC and DEHP-free IV bags
- 2005** – September, Version 2.1 of the GGHC is released for public use, reflecting over two years of revisions (from the steering committee and public comment) *rephrase*
- 2006** – H2E becomes an independent non-profit organization
- 2006** – Hospira and Baxter, the two largest manufacturers of IV bags launch PVC-free lines (*although limited*)
- 2006** – In October, the Wall Street Journal publishes “Hospitals Go ‘Green’ to Cut Toxins, Improve Patient Environment” contributing to greater public awareness of PVC concerns in healthcare
- 2007** – March, European Union passes legislation requiring medical devices containing DEHP to be labeled.
- 2007** – July, Health Care Without Harm, American Medical Association, American Nurses Association, American Public Health Association, Association of Women's Health, Obstetric and Neonatal Nurses, Physicians for Social Responsibility, and the American College of Nurse Midwives submitted a formal petition to the FDA to require DEHP labeling in medical devices.

APPENDIX D**PVC REPORT TIMELINE****Date Activity**

Late 1999 Initial PVC Credit discussed by LEED for Commercial Interiors Committee

Fall 2000 Strenuous analysis and debate by stakeholders; white papers submitted to USGBC

November 2000 Initial discussion about forming TSAC (in response to PCV issue)

April 2001 TSAC formed by USGBC and LEED Steering Committee

December 2001 First TSAC Meeting

2002 TSAC develops Policies and Methodologies (Nine Step Process)

November 2002 PCV Task Group formed

December 2004 Initial Draft Report issued

February 2004 Stakeholders meeting in Washington, DC re: methodology*

Spring 2005 Stakeholder input process

December 2004 Public review; draft report issued

Spring 2005 Public review; comments received

2005-2006 Renewed analysis and report revision

February 2007 Report completed and issued

*correction, made 2/26/07

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APPENDIX E**INDEX OF ACRONYMS AND ABBREVIATIONS**

AACN – American Association of Colleges and Nursing
AAP – American Academy of Pediatrics
ACC – American Chemistry Council
ACNM – American College of Nurse Midwives
ACSH – American Council on Science and Health
ADPSR – Architects, Designers, Planners for Social Responsibility
AHA – American Hospitals Association
AMA – American Medical Association
ANA – American Nurses Association
APHA – American Public Health Association
CHEJ – Center for Health, Environment, and Justice
CCC – Chlorine Chemistry Council
CCHW – Citizens Clearinghouse for Hazardous Waste
CHW – Catholic Healthcare West
CI – Chlorine Institute
CPSC – United States Consumer Product Safety Commission
DEHP – di(2-ethylhexyl) phthalate
EHM – Embodied Health Movement
EPA – United States Environmental Protection Agency
EPP – Environmentally Preferred Purchasing
FDA – United States Food and Drug Administration
GGHC – Green Guide for Healthcare
GPOs – Group Purchasing Organizations
GRRN – Grassroots Recycling Network
HBN – Healthy Building Network
NCEH – National Center for Environmental Health
HCWH – Health Care Without Harm
HSM – Health Social Movement
H2E – Hospitals for a Healthy Environment
IAFF – International Association of Fire Fighters
IARC – International Agency for Research on Cancer
ICN – International Council on Nurses
LCA – Life Cycle Assessment
LEED – Leadership in Energy and Environmental Design
MBDC – McDonough Braungart Design Chemistry, LLC
MOU – Memorandum of Understanding
OCEH – Oregon Center for Environmental Health
OSHA – Occupational Safety and Health Administration
OTA – Oregon Toxics Alliance

NIOSH – National Institute for Occupational Safety and Health
NTP-CERHR – National Toxicology Program, Center for Evaluation of Risks to Human
Reproduction
PBT – Persistent Bioaccumulative Toxic Chemicals
PIHM – Public Interest Health Movement
POP – Persistent Organic Pollutant
PSR – Physicians for Social Responsibility
PVC – Polyvinyl chloride
RA – Risk assessment
SMO – Social movement organization
UAN – United American Nurses
USGBC – United States Green Building Council
VCM – Vinyl chloride monomer
VI – Vinyl Institute
VOC – Volatile organic compound
WHO – World Health Organization

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