Social Movement-Corporate Coalitions: How divisions between corporations within an industry present opportunities for environmental social movements

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Introduction

In this study I investigate coalitions between advocacy organizations and corporations with respect to the government regulation of appliance and equipment energy consumption. In general, corporations tend to oppose government regulation because it may require appliance and equipment manufacturers to redesign their products and modify their manufacturing process. In contrast, energy efficiency advocates, who are part of the broader environmental movement, typically support government regulation because it can lead to reductions in greenhouse gas emissions resulting from energy production. Advocates and corporations engaged in government regulation leads to unequal power relations because the corporations have greater research and expertise resources to influence the policy process. This study examines the ways in which advocacy organizations leverage divisions between corporations on opposing sides of the regulatory process to bring about change. They do so by forming strategic alliances, called social movement-corporate coalitions, with selected corporations or industry segments that can stand to benefit from increased regulation.

This study investigates the formation of alliances between advocacy organizations and corporations to develop a contribution to the literature on social movement theory by expanding the current theory of the industrial opportunity structure.

Background

The 1973 oil embargo and the ensuing energy crisis exposed the United States vulnerability to unstable energy supplies, prompting the development of energy efficiency regulatory programs for household appliances and equipment at both the state and federal level. These programs are intended not only to save energy, but also to reduce greenhouse gas emissions associated with energy

production. Three main actors are involved in setting regulatory policy in the United States: regulators, corporations, and advocacy organizations.

In 1976 the California Energy Commission (CEC) set the first standards for household appliances and equipment in the United States (California Energy Resources Conservation and Development Commission, 1976). Standards are a maximum threshold for the amount of energy an appliance can consume; as a result, manufacturers are prohibited from manufacturing and selling products in the United States that consume more energy than the minimum threshold. Since then the CEC has regulated over 60 categories of appliances and equipment (California Energy Commission, 2015). These standards prohibit the manufacturing and sale of products in the state of California that consume more energy than the maximum threshold. Due to federal preemption law, DOE standards preempt state standards when the same product is regulated at both the federal and state level.

In 1979, the Energy Policy and Conservation Act established a *federal* regulatory program for reducing the amount of energy consumed by household appliances and equipment. The United States Department of Energy (DOE) was given the responsibility of setting minimum energy performance standards for major household appliances (e.g. refrigerators and clothes washers). The DOE currently regulates over 50 categories of appliances and equipment (Department of Energy, 2014). By 2030, federal standards are cumulatively expected to save 6.8 billion tons of carbon dioxide emissions, which are equivalent to the annual greenhouse gas emission of 1.4 billion cars (Department of Energy, 2014).

Industry members are composed of appliance and equipment manufacturers and their consultants, the components manufacturers who manufacture the components used to build appliances and equipment, and industry trade associations whose members are appliance and equipment manufacturers. Improving the efficiency of appliances and equipment requires new more energy efficient technology and improved design, both of which may cost manufacturers more money to build and require modification to manufacturing processes. For example, appliance manufacturers could

significantly improve the energy efficiency of refrigerators through the use of vacuum sealed doors (Griffith, Arasteh, & Turler, 1995), but implementing this technology would come at a considerable cost to manufacturers that would have to use new materials and modify their manufacturing process. As a result the technology does not currently exist on the market. Due to the cost of improved energy efficiency, industry stakeholders are typically opposed to energy efficiency standards and advocate for standards to be as low as possible. Industry members change from rulemaking to rulemaking depending on the product undergoing regulation; for example the industry members involved in a rulemaking for a television standard are different from the industry members involved in a rulemaking for an air conditioning standard.

Energy efficiency advocates (called advocates) are composed of nonprofit organizations and utilities. The nonprofit organizations are from two general groups. Environmental organizations such as the Natural Resources Defense Council and Earth Justice participate due to their interest in energy efficiency as a means of reducing greenhouse gas emissions. The production and use of energy is a resource-intensive process that produces a significant amount of greenhouse gas emissions. By reducing the amount of energy consumed by households, the amount of energy produced is also reduced, and as a result fewer greenhouse gases are emitted into the atmosphere. Consumer organizations such as the Consumers Union focus on the cost savings benefits associated with energy efficiency changes. They also work with utilities that support energy efficiency when their profits have been decoupled. Decoupling mechanisms disassociate the link between utility profits and the sale of energy; instead, the rate of return on the sale of energy is aligned with revenue targets set by state public utility commissions. Rates are adjusted to meet these revenue targets. This allows utilities to support energy efficiency efforts without hurting their bottom line. Unlike industry stakeholders, advocates do not vary from rulemaking to rulemaking; for the most part the same advocacy organizations are involved in each federal and state rulemaking.

Rulemaking Process

Regulators use a rulemaking process during which industry and energy efficiency advocates submit public comments to a regulatory agency in order to influence the stringency of the regulation. The rulemaking process for both federal and state standards is fairly similar; as a result I have combined and simplified the descriptions of both rulemaking processes in order to produce a generic four-step process describing the development of energy efficiency standards (Department of Energy, 2015; California Energy Comission, 2013). Each step is summarized below; see Figure 1 for a visual representation of the rulemaking process.

- The *Framework Phase* of the rulemaking process occurs when the regulatory agency publishes its framework and timeline for developing a standard. During this phase the regulatory agency will request that stakeholders provide product performance and market data, which the regulatory agency will use to develop a preliminary analysis of the product under consideration for regulation. At the federal level it is mandatory that product manufacturers provide data to the DOE, whereas at the state level it is optional.
- The *Preliminary Analysis Phase* of the rulemaking process occurs one-to-two years after the Framework Phase of the rulemaking. The regulatory agency will lay out its preliminary analysis which they will use to develop the energy efficiency standard. The preliminary analysis includes an estimate of the average (or baseline) energy consumption of the typical product sold on the market, analysis of the ways in which the typical product can be modified to increase its energy efficiency, an estimate of the cost to the manufacturer associated with each incremental improvement in energy efficiency, and national energy savings associated with each incremental improvement in energy efficiency. The regulatory agency will open up a public comment period during which stakeholders can submit technical comments agreeing or disagreeing with the

regulatory agency's preliminary analysis. The regulatory agency will also ask stakeholders for specific data to fill in any gaps in their analysis.

- The *Draft Regulation Phase* of the rulemaking process typically occurs one year after the Preliminary Analysis Phase concludes. During this phase of the rulemaking process the regulatory agency proposes a draft standard and provides analysis to support its regulatory decisions. The regulatory agency will open a public comment period during which stakeholders can submit technical comments agreeing or disagreeing with the proposed standard. The regulatory agency will also host a public meeting where they will review the proposed standard and their analysis. Stakeholders are also given the opportunity to speak at the public meeting in order to suggest changes to the proposed standard and to provide analysis to justify their requests.
- The *Final Rule Phase* of the rulemaking process typically occurs one year after the Draft Regulation Phase of the rulemaking concludes. During this phase the regulatory agency publishes a revised version of the standard incorporating comments from stakeholders. In this final phase there is a brief period for comments from stakeholders. Stakeholders can either support the final rule or provide a justification for further revisions to the standard. During this phase regulatory agencies are resistant to further revise the proposed standard because it will delay the rulemaking process; as a result, it is rare for the regulatory agency to make further changes to the proposed standard. At the end of the public comment period the regulatory agency will finalize the standard. Even though the standard has been finalized there is always a period of two to three years until the standard enters into force; this period allows manufacturers time to prepare for the new standard.

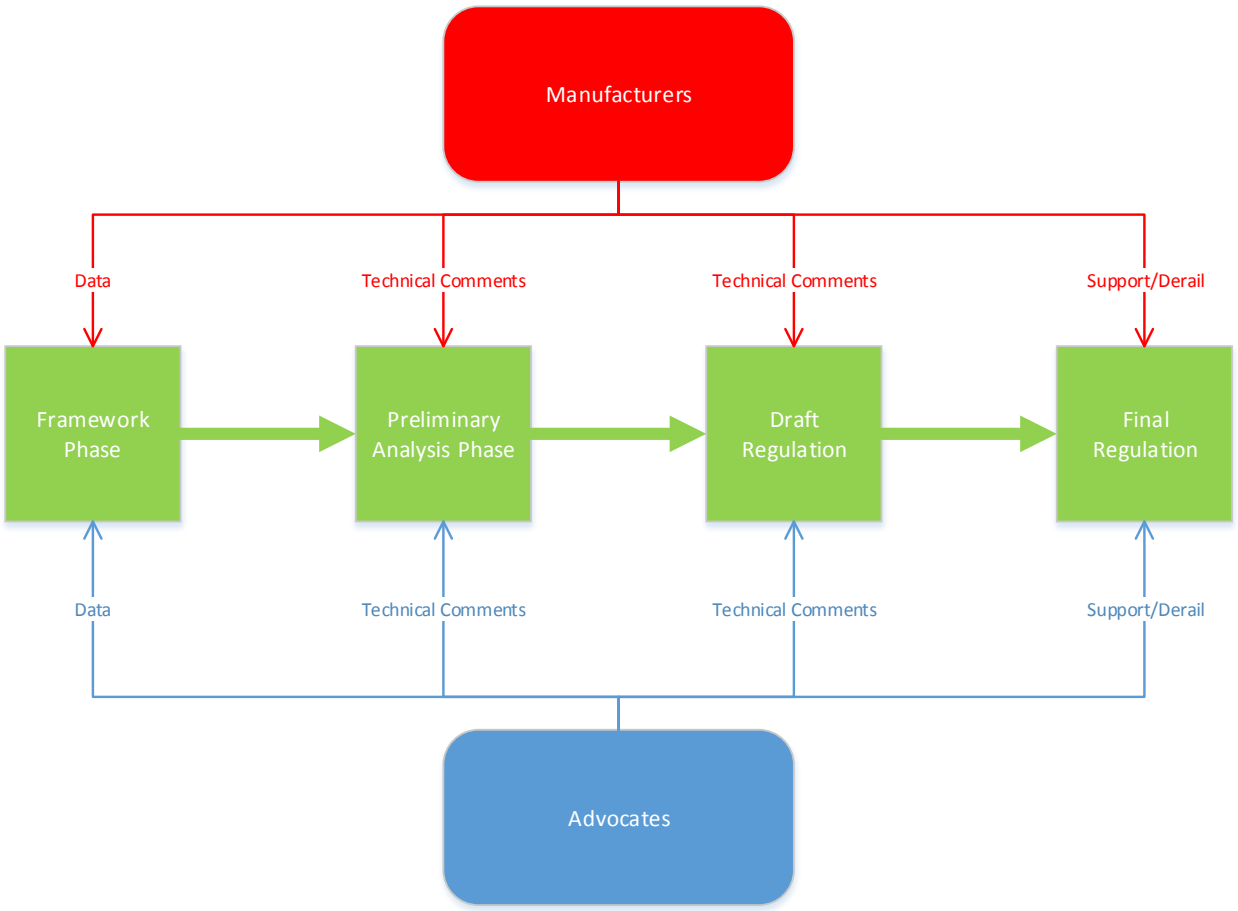

Figure 1: Rulemaking process for energy efficiency standards

Industrial Opportunity Structure and Social Movement-Corporate Coalitions

In this section, I review theory helpful to understanding the formation of social movement opportunities resulting from the regulatory process described above. Beginning in the 1980s, the governments of both the United States and the United Kingdom implemented several neoliberal policies which drastically reshaped their governments (Harvey, 2007).The results of these policies include the privatization of government, reductions in the size of government, the obliteration or reduction of social programs, and the aggressive deregulation of markets (Harvey, 2007). As the willingness and capacity of

governments to regulate corporations weakened, social movements also shifted their targets toward direct action aimed at changing corporate policy (Baron, 1999; Baron, 2001; King, 2008). Responding to this change in social movement aims, social scientists expanded their research focus from social movements targeting the state to social movements targeting corporations. To study social movements targeting corporations social movement scholars have developed a theory called the industrial opportunity structure.

The industrial opportunity structure combines social movement theory with organizational theory. It is based on the idea that the way industry is structured influences social movement strategies and outcomes. In other words, industry structures make some corporations more vulnerable to social movement action, which makes them a better target for social movements looking to change corporate policy. Industrial opportunity structure involves three primary components: industry characteristics, economic and institutional relationships, and corporate culture (Schurman, 2004). In the following sections I discuss the three components of the industrial opportunity structure and develop a set of research questions regarding the formation of social movement-corporate coalitions between advocates and product and component manufacturers.

Industry Characteristics*:* Industry characteristics make some corporations more or less vulnerable to social movement action. One important industry characteristic is market share. In a market there are both *incumbents*, those who already hold positions in the market and want it to stay static, and *challengers*, those who want to challenge the incumbents to gain greater market share (Fligstein and McAdam 2011). Challengers vying for market share may be more amenable to opportunities created by social movement mobilization (Fligstein and McAdam 2011). Another important industry characteristic is the nature of the products, such as whether the company produces products that are detrimental to the environment or whether it produces more environmentally friendly products (Schurman, 2004). A third characteristic is the relative importance of the brand name and

reputation to a company (Best & Lowney, 2009; Spar & Burns, 2000; Baron & Diermeier, 2007; Schurman, 2004; King & McDonnell, 2012; Bartley & Child, 2014; King & Soule, 2007; den Hond & de Bakker, 2007). Furthermore, industry dynamics can enhance corporation vulnerability, in particular the level of competition among corporations. Industries where there is intense competition among corporations may be particularly vulnerable to social movement action because the competitive advantage of any one corporation will be weakened by the competition (Baron, 2001; King, 2008; King, 2008; Spar & La Mure, 2004).

Changes in government regulations can serve as "exogenous shocks" to an industry structure and can lead to deep changes in the relations among corporations (Fligstein & McAdam, 2011). For example, government regulatory intervention of corporations within an industry can upset the rules through which the industry was originally structured; as a result the market position of some corporations within an industry may be weakened (Baron, 1999; Baron, 2001; King, 2008). Consequentially, other corporations may be advantaged by regulation through the strengthening of their market position compared to their competitors'; as a result some corporations within an industry who stand to benefit from government regulation may come to support the regulation (Baron, 1999; Shwom, 2011). These divisions within industry can present opportunities for social movements to collaborate with corporations who share their aims (Shwom, 2011).

Another dimension of the industry opportunity structure involves differences between consumer manufacturers and component manufacturers in the supply chain. Some component manufacturers build components that increase appliance and equipment efficiency. For example, some component manufacturers produce computer chips that reduce desktop and laptop computer energy consumption (Delforge, 2013). Often these types of components cost more to produce because they use better material or have a more complicated design; as a result component manufacturers make a higher margin of profit on the sales of these components. Due to their increased cost, more efficient

components are not widely used because appliance and equipment manufacturers are more likely to opt for less expensive components in order to reduce their manufacturing cost. However, when a government agency implements an energy efficiency regulation, appliance and equipment manufacturers will have to utilize more efficient components in order to meet regulatory requirements; as a result regulation can give component manufacturers who build more efficient components a market advantage by increasing the size of market for their more expensive components.

***Economic and Institutional Relationships**:* Economic and institutional relationships involve the relationships among actors in the broader "organizational field" (Schurman, 2004). The broader organizational field includes consumer manufacturers, suppliers, consumers, regulatory entities, and competing industries (Schurman, 2004; DiMaggio & Powell, 1983). Social movements can target corporations indirectly by identifying and leveraging vulnerabilities within their supply chain, called "industry pressure points" (Schurman, 2004). Prior research has primarily looked at the potential for social movements to influence retail firms as a way to gain leverage over producer firms. For example Rachel Schurman studied social movements targeting Monsanto, a biotech firm, which supplied genetically modified grain to farmers in Europe who used them to produce crops which were used to make food that was eventually sold in supermarkets (Schurman, 2004). In this example an anti-biotech social movement targeted grocery stores carrying genetically modified foods as a way of indirectly targeting Monsanto.

Based on this and other research several general rules have been identified regarding pressure on retail and consumer-oriented firms. Corporations are more vulnerable to social movement action if there are a smaller number of buyers because it will be more difficult for corporations to redistribute their products to other buyers if they come under social movement pressure (Gereffi & Korzeniewicz, 1994; Schurman, 2004). Corporations are more vulnerable if the degree of commitment from their consumers is weaker, because their consumers will be more likely to break their relationship with

corporations once they have come under social movement pressure (Gereffi & Korzeniewicz, 1994; Schurman, 2004).

Whereas prior research on the supply chain dynamics has focused on the points of leverage in the downstream in the supply chain, my study moves upstream to look at points of leverage among component manufactures that produce components used by product manufactures to build products. Under these upstream conditions the same dynamics of market competition and level of commitment may apply.

***Corporate Culture**:* The third dimension of the industry opportunity structure, corporate culture, involves norms, values, cognitive categories, and other symbolic dimensions of corporate culture. For example, a turnover in corporate leadership resistant to "domestic partner" benefits presented an opportunity for lesbian and gay employees at the Coors Brewing Corporation to organize and compel the company to offer these types of benefits to its homosexual workers in same sex relationships (Raeburn, 2004). In another example, German pharmaceutical firms which had a diversified product line as well as an advocate for biotechnology on their board were more likely to resist social movement action then other firms (Weber, Thomas, & Rao, 2009). Both of these cases demonstrate how factors internal like corporate culture can make a corporation more or less vulnerable to social movement action. These same internal factors may also play a role in the decision by a corporation to join a social movement-industry coalition.

Research Questions

Based on the literature review above, I have composed the following research questions to help guide my research. Each research question addresses a different component of the industrial opportunity structure and focuses on how they might affect the formation of social-movement corporate coalitions.

- **Industrial Characteristics:** How does the *market position of a product and component manufacturer* affect the formation of social movement-corporate *coalitions between advocates and industry*?
- **Economic and Institutional Relationships:** How does the *level of market competition* affect the formation of social movement-corporate *coalitions between advocates and component manufacturers*?
- **Corporate Culture:** How does *corporate culture* affect the formation of social movement-corporate *coalitions between advocates and product or component manufacturers*?

Methods

I relied on grounded theory (GT) to direct my study. GT is a methodology for conducting qualitative research (Glaser and Strauss, 1967; Corbin and Strauss, 1998). It enables a comprehensive theoretical understanding of social phenomena and lends itself to the development of middle range theory (Tavory & Timmermans, 2009). In GT studies, theory emerges from the research. In other words, GT researchers believe that social life is bounded and structured and that that through investigation a theory can be derived that will encapsulate and explain it (Tavory & Timmermans, 2009). In this study I set out to investigate the engagement between stakeholders (government regulators, industry members, and energy efficiency advocates) involved in the development of energy efficiency standards. I focused my analysis on the conditions that led to the formation of these social movement-corporate coalitions.

Early in the study, I became aware of a strategy through which advocates formed social movement-corporate coalitions with industry during highly contentious rulemakings, or those wherein the majority of the manufacturing industry was against the standard. Thus, I focused on three examples, or "cases" of federal and state rulemakings for energy efficiency standards for household appliances and

equipment. These rulemakings were identified by interviewees as instances in which advocates collaborated with an industry member (or members) in order to advocate for more stringent energy efficiency regulations under highly contentious conditions. The rulemakings are California state energy efficiency standards for televisions and computers as well as a federal energy efficiency standard for central air conditioners; see Table 1 for a summary of rulemakings.

Table 1: Summary of Rulemakings

Appliance/Equipment:	**Regulatory Agency:**
Air Conditioners	DOE
Computers	CEC
Televisions	CEC

This study relies on two main sources of data: documentary analysis and interviews. I describe both methods below in more detail.

Documentary Analysis

My documentary analysis was based on publicly available material related to the selected rulemakings. Publically available material includes the draft and final standard, DOE and CEC justification for the standard, government analysis, public hearing presentations, public hearing transcripts, technical/public comments submitted by stakeholders, and any court related documents related to the rulemaking. All material was located on the websites of the DOE and the CEC. In some cases, I also collected data from websites of the organizations involved in the rulemakings. For each rulemaking, I downloaded all documentation related to the rulemaking, reviewed each document, categorized it, and organized each document into chronological order. I used the following categories: government notice, government analysis, public hearing presentation, public hearing transcript, legal document, and public/technical comment. After reviewing, categorizing, and placing the documents into chronological order, I selected key documents that would help me to understand the timeline and important events

during the rulemaking process. Key documents included draft and final standard, CEC and DOE justification for standards, trade association comment and presentations, advocate comments and presentations, manufacturer ally comments and presentations, and public hearing transcripts. I reviewed these documents and created a detailed timeline of the rulemakings, outlined pivotal moments, and summarized the arguments made by each stakeholder group (government, industry, and advocates). I then selected for coding any document that discussed data, expertise, or support provided by the manufacturer ally. These documents were uploaded to ATLAS.it, and I conducted focused coding.

Table 2: Document Collection and Review Summary

	Air Conditioner Rulemaking (number of documents)	Television Rulemaking (number of documents)	Computer Rulemaking (number of documents)
Downloaded from rulemaking website, reviewed, categorized, and put into chorological order	333	97	57
Read fully and used to develop a timeline for the rulemaking process	39	36	28
Coded and used in my analysis	28	16	10

Semi-structured Interviews

I conducted ten semi-structured interviews with regulators, industry members, and energy efficiency advocates; see Table 3 for a summary of interviewee types. Interview guide topics include the interviewee's role in the regulatory process, strategies used by stakeholders to influence the regulatory process, and the success of stakeholder strategies; for a copy of the interview guide; see Appendix 1. Interviewees were initially selected through publicly available documentation based on their affiliation as a regulator, advocate, or manufacturer. Snowball sampling was used to select additional interviewees. Interviews lasted between 1 and 1 ½ hours. Three interviewees were interviewed more

than once to ask supplemental follow-up questions. Each interview was transcribed and supplemented with field notes. The interview transcripts were uploaded to ATLAS.ti, a software program used to analyze qualitative data. I used ATLAS.ti to assign codes through "open coding" of emergent social phenomena within the interview data and memos (Glaser & Strauss, 1967; Strauss & Corbin, 1998). Through this process, certain "categories "emerged that described the many ways in which advocates formed social movement-corporate collaborations with industry during highly contentious rulemakings; categories are common themes or patterns identified across several codes (Charmaz, 1995; Glaser & Strauss, 1967; Strauss & Corbin, 1998). Once I identified common themes, I began to search the relevant literature and identified the industrial opportunity structure (Schurman, 2004) as a relevant theoretical lens for understanding social-movement corporate coalitions. At this point, I began to utilize "focused coding" on the remainder interviews; focused coding is more directed and involves reviewing the data to identify select codes (Charmaz, 1995; Glaser & Strauss, 1967; Strauss & Corbin, 1998).

Table 3: Summary of Interviewees

Number of Interviewees:	Affiliation:
6	Advocate
3	Industry Member
1	Regulator

Findings

In the following sections I review three cases in which social movement-corporate coalitions have formed between advocates and manufacturers of both products and components. I conclude this section by summarizing my main findings.

Residential Central Air Conditioner and Heat Pump Rulemaking

Residential central air conditioners and heat pumps are used to condition the temperature of air in homes. They utilize a large compressor unit located outdoors, which pulls air from indoors and cycles it over a coil filled with refrigerant. The conditioned air is then pumped back indoors as cool air. The metric for measuring air conditioner efficiency is called the seasonal energy efficiency ratio (SEER). It measures an air conditioner unit's cooling output during a typical cooling-season divided by the total amount of electricity used over the same period of time. The higher the SEER value the greater the efficiency; for example, an air conditioner rated at the 11 SEER level is 10% more efficient than an air conditioner rated at the 10 SEER level.

The first federal standard for residential central air conditioners and heat pumps was set in 1987 and entered into force in 1992. It set the efficiency requirement for air conditioners at the 10 SEER level; meaning that a manufacturer could not sell an air conditioner in the United States rated below the 10 SEER level. In 1999, DOE initiated a rulemaking to revise the standard in order to further increase air conditioner efficiency (Department of Energy, 2001b). Air conditioner manufacturers and their trade association, the Air Conditioning and Refrigeration Institute (ARI), pushed for a standard set at the 12 SEER level (Department of Energy, 2001b); which would mean a 20% increase in efficiency compared to the existing standard set at the 10 SEER level. The energy efficiency advocates on the other hand wanted for a more stringent standard. They advocated for the standard to be set at the 13 SEER level (Department of Energy, 2001b); which would mean a 30% increase in efficiency compared to the existing standard. The rulemaking was a highly contentious process with over 50 technical comments summited to DOE over the course of the rulemaking from industry opposing the standard, over 50 technical comments from advocates supporting the standard, over 100 comments from private citizens the majority of which opposed the standard, and comments opposing the standard from 12 conservative members of the House and Senate.

The battle ground over the 12 SEER and 13 SEER levels centered on DOE's estimate of life cycle cost (LCC); a measure that balances the increased purchase price of a more energy efficient air conditioner with the amount of money saved in energy bills. In very simple terms, DOE has to make sure that the increased purchase price of a more energy efficient air conditioner will pay itself off over time in reduced energy bills, so that the net cost (purchase price and the cost of energy to power the device) of a more efficient air conditioner is less than an air conditioner rated at the 10 SEER level. DOE used two methods to determine the increased cost of a more energy efficient air conditioner, which is a major component of the LCC estimate. Under the first method, DOE conducted a reverse engineering analysis in which DOE, through the National Laboratories, obtained and tore down air conditioners in order to determine the additional cost of improved efficiency. Under the second method, DOE asked industry members (both manufacturers and the trade association) to provide DOE with an estimate of the increased cost of manufacturing a more efficient air conditioner. In response ARI provided DOE with manufacturing cost estimates which did not align with DOE's reverse engineering analysis and indicated a significantly greater burden to manufacturers than DOE's analysis (Department of Energy, 2001b). Several of the advocates accused ARI of "overestimate[ing] the costs of complying with more stringent standards" (Department of Energy, 2001b). When DOE pushed ARI to explain the discrepancy, ARI was unable to provide DOE with an explanation that DOE found satisfactory (Department of Energy, 2001b). In the end DOE based their decision on their own reverse engineering analysis and on the low end of ARI's manufacturing cost estimates, and as a result DOE set the standard at the 13 SEER level (Department of Energy, 2001b).

The standard was developed under the Clinton Administration, and due to the timing of the rulemaking it was not completed until January 19, 2001, just before George W. Bush took office the following day. After this change in office something unprecedented occurred:

> The final rule was [written] down in the federal register and it was done. And [the Bush Administration] did something unprecedented. They came in and said, 'We the new administration don't agree, and we're going to pull the specification.' – DOE Contractor

On January 24, 2001 the Assistant to the President and Chief of Staff Andrew Card issued a memorandum ordering Executive Branch agencies, including DOE, to review ongoing rulemakings and postpone the effective date for any new regulations that were not yet in force (Card, 2001). This action was taken as a part of President Bush's agenda to reduce government regulation, in particular regulation addressing environmental issues. DOE under the leadership of Spencer Abraham the Bush appointed Secretary of Energy, DOE postponed the implementation of the new air conditioner standard and initiated a new rulemaking to further review its stringency (Department of Energy, 2001a). As a result of DOE's actions a second round of the highly contentious rulemaking began.

ARI and several major air conditioner manufacturers, including Carrier Corporation, Lennox International, Nordyne Inc., Rheem Manufacturing Company, and The Trane Company, advocated for DOE to lower the stringency of the standard to the 12 SEER level (Department of Energy, 2004). The advocates pursued two parallel strategies. First they engaged in the reopened rulemaking by advocating for DOE to maintain the stringency of the standard at the 13 SEER level (Appliance Standards Awarness Project, April 2001). Second they petitioned the courts to force DOE to stick with the original standard set at the 13 SEER level; their argument was based on federal law that prohibited DOE from weekending or lowering the stringency of a standard that had already been finalized (Natural Resources Defense Council, et al. v. Abraham, 2004). In the end, the advocates lost the rulemaking, but won the legal argument. A more conservative DOE, under the leadership of Spencer Abraham, sided with ARI and the major air conditioner manufacturers by pulling the standard set under the Clinton Administration and setting a new standard at the 12 SEER level (Department of Energy, 2002). Two years after DOE set the new standard the United States Court of Appeals 2nd Circuit ruled to overturn DOE's action effectively reinstating the original standard at the 13 SEER level (Department of Energy, 2004). The 2nd Circuit

sided with NRDC and the other petitioners, they agreed that DOE could not weaken or lower the stringency of a standard after the standard had already been finalized (Department of Energy, 2004). ARI and the manufacturers could have appealed the 2nd Circuit's decision. But, as explained to me by a former DOE contractor, the manufacturers had already used up two of the three years they had to prepare for the new standard, and if they lost the appeal then the manufacturers would have to instantly comply with the standard. This would be "a disaster, because [the manufactures] would have been out of compliance;" as a result ARI and the manufacturers dropped the issue.

During the second round of the rulemaking, the Goodman Manufacturing Corporation was the only major air conditioner manufacturer to support the standard. During the initial round of public comments Goodman sent a letter to Secretary Abraham stating that Goodman "approve [of] the standard to increase the minimum efficiency requirement of new residential and central air conditioners by 30 percent" (Goodman, 2001b p. 1). Learning of Goodman's support for the standard the advocates reached out to Goodman and the two formed a coalition against ARI and the other major manufacturers.

At the time of the rulemaking, Goodman was a family owned business (Goodman, 2001c). The company had almost 8,000 employees and in 2000 recorded $2.1 billion in sales (Goodman, 2001b), which made Goodman the largest privately held air conditioning company in the world (Abraham, 2001) and the second-largest manufacturer of residential cooling unites in the United States (Goodman, 2001b). The company was primarily a low cost manufacturer, although they sold products at all price points (Goodman, 2001c). As one advocate describes the company, "Goodman was a bit of a black sheep within the industry. They were not terribly well integrated into the industry." The advocate attributed Goodman's independence to their being a family owned company. All the other major air conditioner manufacturers were privately owned.

Goodman appeared to have a market interest in supporting the more stringent standard. Doug Marty, the Executive Vice President of the Goodman Holding Company, in a statement to DOE described their company's position this way:

> Goodman has a marketing philosophy of selling in volume. The incremental cost to the manufacturer to produce a 13 SEER unit is only about $100 and we feel that the most efficient technology should be available to people of all income levels at an affordable price. Unfortunately, all manufacturers may not have this same marketing philosophy. Instead some manufacturers may be seeking protection of higher profit margins on their more efficient equipment. A 13 SEER standard would force all manufacturers to be truly competitive and provide all consumers with the most affordable energy efficient technology for air conditioners that is available today. (Goodman, 2001c p. 2)

Goodman sells in high volume therefore they can sell their products at a lower price compared to their competitors who sell fewer products at a premium. If the standard were set to the 13 SEER level then Goodman could sell 13 SEER air conditioners at a lower price than their competitors. Furthermore, Goodman's competitors would lose the higher profit margins they were getting for the 13 SEER air conditions. To expand upon this point, the size of the unit, in particular the size of the cooling coil, accounts for the greatest difference in manufacturing cost between lower and higher efficiency air conditioners. What this means for Goodman's competitors is that they had been selling 13 SEER air conditioners as premium products which they could charge higher prices for. If 13 SEER air conditioners became the standard then these manufacturers could no longer sell these products at a premium, instead they would have to sell products at even higher efficiency levels as their premium products. These higher efficiency products are larger and require larger cooling coils; as a result the profit margin for these products would be lower than the profit margin for 13 SEER air conditioners.

Goodman also had a second marketing advantage. Another factor that affects manufacturing costs is the cost of redesigning products and retooling manufacturing facilities. This would not be a significant cost for Goodman:

> From their perspective, [Goodman] told us that they didn't really care whether it was SEER 10, 11, 12, or 13, they're just going to crank them down the assembly line and they would do fine no matter what the standard was. – Advocate

At the time, Goodman was already producing 13 SEER air conditioners as part of their full product line; as a result moving to the higher SEER level simply meant that Goodman would simply produce more of that type of air conditioner (Goodman, 2001c). This was not the case for manufacturers that did not already produce 13 SEER air conditioners. These manufacturers would have to redesign their products and retool their manufacturing facility, which comes at a significant cost (Air-Conditioning and Refrigeration Institute, 2000). By not having to redesign their products or retool their manufacturing facility Goodman could invest their resources elsewhere giving them a second market advantage over their competitors.

The advocates would not have identified Goodman as a potential ally if it had not been for the letter Goodman sent to Secretary Abraham shortly after DOE reopened the rulemaking. One of the advocates I interviewed explained that "the manufacturer would probably [need to] come out of the woodwork; it isn't like we would persuade them to take a position." This means that the manufacturer has to indicate in some way that they share the same goals as the advocates, otherwise the advocates will be unaware that a manufacturer shares their position. Once the advocates become aware that a manufacturer shares their interests they are quick to act. In the words of one advocate:

> Once we get a clue that someone is on our side you better believe that we're in touch with them and thinking about how we can work with them to encourage them to be more politically visible or we may talk to them about what information they might provide to us that might help us make better technical comments.

The advocate's statement brings to light some of the ways in which a manufacturer ally can help the advocates achieve their goals. I have identified two ways in which Goodman helped the advocates.

First Goodman diversified the advocates' coalition. Having a manufacturer among their ranks strengthened the advocates' argument that the air conditioner standard could be raised to 13 SEER without a detrimental impact on manufacturing because a major manufacturer based in the United States supported the more stringent standard. Furthermore, Goodman was a highly visible member of

the advocates' coalition. The Chairman and CEO of Goodman Holding Company, John B. Goodman, gave several interviews to reporters, including interviews to the Washington Post and the New York Times (Skrzycki 2001; Wald 2001). John B. Goodman testified at a DOE public hearing for the reopened rulemaking; during his testimony he brought an air conditioner coil to show the difference in size between a 12 SEER and 13 SEER rated air conditioner to prove that it was not as significant a burden as ARI and other manufacturers had made it out to be (Air-Conditioning and Refrigeration Institute, 2001). Goodman also signed onto two of the advocates' technical comments submitted to DOE, giving additional weight to their comments.

Beyond lending their support for the higher standard level, Goodman provided technical data and expertise that the advocates used to strengthen their arguments for a more stringent standard set at the 13 SEER level. Goodman endorsed DOE's initial estimates of the incremental cost to manufacture a 13 SEER rated air conditioner, which DOE had originally used as their justification for setting the standard at the 13 SEER level (Goodman, 2001b). To support their position, Goodman provided instillation cost data for a Goodman brand SEER 13 air conditioner and the installation costs of two major competitors to demonstrate how these costs aligned with DOE's reverse engineering estimate (Goodman, 2001b). Goodman provided market data, including the number of manufacturers in the market with SEER 13 products (Goodman, 2001b) and the number of air conditioner models that met or exceed the SEER 13 level (Goodman, 2001b; Goodman, 2001a) to demonstrate that several manufactures were capable of producing SEER 13 rated air conditioners. Goodman also provided insight on the impact that the new standard would have on the manufacturing industry. Goodman stated that the cost of retooling manufacturing facilities to produce SEER 13 air conditioners would not present a significant burden to manufactures (Goodman, 2001b). Goodman also explained how the incremental cost of SEER 13 rated air conditioners would decrease over time as manufacturers scaled up their manufacturing process (Goodman, 2001b). Having a manufacturer ally gave the advocates access to

data and expertise that they would not normally have access to during a highly contentious rulemaking. The advocates utilized the data and expertise provided by Goodman to enhance their technical comments submitted to DOE (Natural Resources Defense Council, 2001) and their petition to the 2nd Circuit Court of Appeals (Natural Resources Defense Council, et al. v. Abraham, 2004). While it is difficult to quantify the impact that the coalition between Goodman and the advocates had on the final outcome, it is clear that Goodman's support for the more stringent standard as well as the data and expertise Goodman shared with the advocates significantly strengthened the advocates' position.

Television Rulemaking

In early 2008, CEC initiated the development of the first on mode energy efficiency standard for flat screen televisions in North America[1] (California Energy Commission, 2007). This would be the first time the regulatory agency tackled a consumer electronic as complex as televisions. Complex consumer electronics like televisions are difficult to regulate because the technology advances rapidly and new functionality, like 3D programing and web connectivity, are continuously being developed and integrated into televisions. In the end CEC was successful in setting a standard for televisions, but the process was highly contentious (California Energy Commission, 2009a).

Shortly after CEC announced their intention to develop a standard for televisions, the Consumer Electronics Association (CEA), the primary trade association for consumer electronics, came out in opposition to setting standards for televisions stating that the industry preferred a market-driven approach to energy efficiency (California Energy Commission, 2008), like the United States Environmental Protection Agency's (EPA) ENERGY STAR labeling program; which utilizes consumer awareness through a voluntary labeling program to drive sales of more energy efficiency electronics. An industry member explained their position this way:

[1] On January 1, 2006 a standard limiting the amount of power a flat screen television could consume in standby mode entered into force in California. The standard limited power in standby mode to 3.0 watts per hour.

> Several years ago, attention started turning to consumer electronics as a vast new opportunity, even though efficiency wasn't new to us. We have been in the [ENERGY STAR] program now for 20 plus years. But for many advocates and regulators interested in regulation this looked like a green field of opportunity… I think [the advocates and regulators] were coming from an experience, this long experience, which told them the right way to go about [energy efficiency], is through regulation. By and large, for the end use products that are in our sector government mandated limits are really the wrong way to go about it. If you're coming up with a regime that is regulatory, it's fair to say in general that it will be hard to keep pace with the industry. So regulations are always going to be backwards looking, static, and rapidly out of data. That's the best case, in the worst case they set limits that will have unintended consequences or inhibit innovation.

As the rulemaking progressed, CEA and major television manufacturers, including Sony, JVC, Panasonic, Sanyo, Toshiba, Sharp, and LG, took an even stronger position against standards for televisions. In the final round of public comments CEA lambasted the standard in a 91 page letter to the CEC, in which CEA claimed that CEC based their justification for the standard on "flawed assumption, erroneous calculations, and outdated technical data" (California Energy Commission, 2009a p.1). The major point of contention in this rulemaking was the analysis conducted by the California Investor Owned Utilities (CA, IOU) to assist CEC in justifying the development of a television standard and determining the stringency of the standard.

CEC has fewer resources than DOE; unlike DOE, CEC does not have an extensive research budget to conduct their own independent analysis. Using the central air conditioner rulemaking as an example, DOE had the budget to conduct a reverse engineering analysis which allowed them to independently verify the cost-effectiveness of setting the standard at the 13 SEER level. Instead, CEC relies entirely on data provided to them by manufactures and analysis conducted by CA IOU, who have research budgets to support the development of energy efficiency regulation in California. Early in the rulemaking, CA IOU's conducted a Codes and Standards Enhancement (CASE) study for televisions, which proposed standards that would save between 118 and 406 Gwh/yr based on an analysis of the television market (Pacific Gas & Electric Company, 2008). This analysis was used by CEC to justify a television standard (California Energy Commission, 2008; California Energy Commission, 2009a). Instead of providing their

own analysis in support of a proposed standard, CEA and the major television manufacturers pursued a strategy of critiquing the CA IOU analysis and, as described above, opposing any standards for televisions (California Energy Commission, 2009a). In particular, they critiqued CA IOU' cost-effectiveness analysis, which showed that manufacturers could comply with the standard without significantly increasing the cost of television (Pacific Gas & Electric Company, 2008; California Energy Commission, 2009a; Consumer Electronics Association, 2009a).

The energy efficiency advocates understood that the rulemaking to develop television standards was going to be highly contentious; it was clear early on that a large majority of the television industry was against standards for televisions. Without industry support CEC would have had to rely entirely on the advocates for data and expertise. As a strategy, the advocates sought out manufacturer allies.

> Basically, it was obvious from testing that [Vizio] had equipment that pretty consistently met the proposed standards or exceeded the proposed standards and so when you see that, when you see one manufacturer who has a consistent record of exceeding the standards that you have in mind, it does actually pay to go reach out to them and we did. To reach out and say, "Look these standards are being proposed, I take it because pretty much all of your equipment would meet them you don't have any real problem with it." And we did that with the notion that, well they probably would say sure… knowing that it was probably to some extent in their interest. – Advocate

Vizio Inc. is a privately owned company that was founded in 2002 and is headquartered in California (Forbes, 2014). At the time of the rulemaking, Vizio was one of the three leading brands of flat panel televisions sold in the United States (Vizio, 2008); in 2008, Vizio televisions accounted for 10% of the televisions sold in the United States (Vizio, 2008). Vizio sold both LCD and plasma flat panel televisions, giving the company the ability to speak to the effects of the television standard on both technologies. Unlike some television brands which sell premium televisions, Vizio sold "high quality value priced televisions" at big box retailers like Wal-Mart, Costco, Sam's Club, and Target (California Energy Commission, 2009b p. 62). Vizio also marketed itself as a company concerned about the environment; the company supported energy efficiency, the use of environmentally friendly materials, and end of life recycling (California Energy Commission, 2009b p. 62). The majority of Vizio's LCD

televisions already met the proposed standard and all of their plasma televisions would be capable of meeting the standard by the time it went into effect (Vizio, 2008). This gave Vizio a market advantage "because it placed their competitors in a bit of a more difficult situation where they had to now invest in upgrading their products on somebody else's schedule in order to meet the new standard" – Advocate. By not having to upgrade their products, Vizio could invest their resources in other area. Furthermore, "Vizio would have the entire time between the tie when the standard were finalized and the time they actually took effect to advertise that they already met the standard" – Advocate. As a company that marketed itself as environmentally friendly, this gave Vizio an additional market advantage because they would look like the only "green" television manufacturer by supporting the standard.

The same day as the public hearing to discuss the draft standard, Kenneth R. Lowe, Vice President and Co-Founder of Vizio, sent a letter supporting the standard to CEC (Vizio, 2008). It was clear that the advocates and Vizio had coordinated the timing of the letter, because the advocates had quotes from the letter in their presentations for the public hearing (California Investor Owned Utilities, 2008; Natural Resources Defense Council, 2008). In a highly contentious rulemaking, where the majority of the industry was opposed to the television standard, it was advantageous to have a major manufacturer support the standard because CEA could no longer claim that the entire industry stood against it. Over the course of the rulemaking Vizio was a highly visible advocate for the television standard; in addition to the letter of support, Kenneth Lowe participated in a public hearing to endorse the standard (California Energy Commission, 2009b). In addition to public support, Vizio provided data showing the incremental cost of the standard to be "tens of dollars" (Vizio, 2008) rather than the hundreds of dollars claimed by CEA (Consumer Electronics Association, 2009b); which had been the largest point of contention between CEA and CEC regarding CEC's justification for the television standard. Furthermore, Vizio provided expertise claiming that the incremental cost would decrease over time as volume increased (California Energy Commission, 2009b p. 63). Vizio also provided expertise regarding the

ability of both LCD and plasma manufacturers to meet the proposed standard, by claiming that the majority of Vizio's LCD televisions already meet the standard four years before it would take effect and that Vizio would produce plasma televisions that would meet the standard by the time it entered into force (California Energy Commission, 2000b p. 63). The advocates utilized the data and expertise provided by Vizio to strengthen their technical analysis and their arguments in support of the standard (California Investor Owned Utilities, 2008; Natural Resources Defense Council, 2008; Natural Resources Defense Council, 2009). By forming a coalition with Vizio the advocates were able to significantly strengthen their position in a highly contentious rulemaking. While it is difficult to measure the exact impact their coalition had on the outcome of the standard it is clear that CEC utilized the data and expertise provided by Vizio as justification for the final standard; CEC utilized the cost-effectiveness data provided by Vizio to support their own cost-effectiveness analysis (California Energy Commission, 2009b) and to demonstrate that manufactures were capable of meeting the proposed standard (California Energy Commission, 2009a). What is clear is that it would have been more difficult for CEC to justify the television standard if the advocates had not brought Vizio into their coalition.

Vizio was not the only manufacture to join the advocates' coalition; 3M also collaborated with the advocates during the rulemaking for the television standard. 3M is a components manufacturer who produces a technology that when built into LCD televisions significantly reduce their energy consumption. The technology is called Vikuiti optical film, when built into the television screen it reduces the amount of backlighting needed to illuminate the screen, as a result the television requires less energy to operate accounting for a 32% reduction in energy consumption (3M, 2009; California Energy Commission, 2009b p. 83).This technology also comes at a low cost, 3M estimated that the incremental cost to manufactures would be less than $20 (3M, 2009), which gives manufacturers of LCD televisions a cost effective option of meeting the proposed standard. As the only components manufacturer with the optical film technology 3M had a market interest in the television standard; if the

standard were enacted, 3M would significantly increase the market for the technology (CEC, 2009B p. 80). This is not to say that 3M was the only components manufacture with a technology that would reduce the energy consumption of LCD televisions (California Energy Commission, 2009b p. 123), but their technology was highly compatible and cost effective (California Energy Commission, 2009b p. 123).

3M has a track record of developing several highly efficient technologies used to reduce the energy consumption of consumer electronics, which it has received recognition for. In 2004, 3M was named ENERGY STAR Partner of the Year by EPA and DOE, which is ENERGY STAR's highest industry honor (3M, 2008). As a leader in energy efficiency, the advocates have a long working history with 3M, in which they have collaborated in the past. Unlike Vizio where the advocates had to identify and reach out to a new ally, the advocates' engagement with 3M happened early on; 3M sent a letter to CEC encouraging them to initiate a rulemaking to develop a standard for televisions during the very initial scoping period when CEC selects the products they will regulate in the coming year (3M, 2008). During the course of the rulemaking 3M shared the details of their technology with the advocates and CEC (3M, 2009), provided incremental costs estimates (3M, 2009), and provided energy savings estimates (3M, 2009) through technical comments and participation in the public meetings. Again, it is difficult to measure the impact of the coalition on the outcome of the standard. What is clear is that the data provided by 3M was utilized by CEC as a part of their cost effectiveness analysis (California Energy Commission, 2009b); as a result the 3M data along with the data provided by Vizio became an important part of CEC's justification for setting a television standard (California Energy Commission, 2009b).

Computer Rulemaking

In 2012, CEC initiated rulemakings to develop energy efficiency standards for several consumer electronics, including computers (California Energy Commission, 2012). At the time of conducting this study, the rulemaking was currently ongoing and CEC had recently published a draft standard for

computers (California Energy Commission, 2015). A coalition of energy efficiency advocates and semi-conductor manufacturers, called the Greentech Leadership Group (GTLG), engaged CEC early in the rulemaking process and has maintained engagement by providing CEC with industry data on the energy savings potential and cost effectiveness of new technologies that can significantly improve the energy efficiency of computers.

The California based GTLG was formed by the advocates in 2012 as an "adversary" to anti-regulatory trade associations like CEA and the Information Technology Industry Council (ITI); which is the primary trade association for information technology manufacturers. The goal of GTLG is to provide CEC with data on new technologies that can reduce the energy consumption of consumer electronics. Unlike CEA and ITI who are composed of information technology and consumer electronics manufacturers, GTLG is an organization composed of semi-conductor manufacturers who produce the computer chips used in consumer electronics. There are twelve semi-conductor manufacturer members in GTLG; manufacturer members include Aggios, Arasan, ARM, Belkin, Eyetech, Lucid, Marvell, On Semiconductor, Pace, Power Integrations, Texas Instruments, and Visionaire (Greentech Leadership Group, 2015). Combined these manufacturers represent a sizable portion of the worldwide semi-conductor market. Their participation in the rulemaking process is helpful because computer chips influence the energy consumption of consumer electronics by affecting their operating efficiency and by enabling power saving capabilities, like computer sleep mode. As the manufacturers of the computer chips used in consumer electronics, semi-conductor manufacturers "have a good perspective on the efficiency levels of different technologies" – Advocate.

Semi-conductor manufacturers often have a business interest in the outcome of standards for consumer electronics. Semi-conductor manufactures invest heavily in the development of advanced computer chips, but these advanced computer chips come at a price premium; as a result electronics manufacturers use lower priced less advanced chips in their products. If CEC set stringent energy

efficiency standards for consumer electronics, manufacturers of consumer electronics would have to build their products using more advanced computer chips, thus significantly increasing the market for the higher priced computer chips. While semi-conductor manufacturers have a business interest in supporting standards for consumer electronics, historically few semi-conductor manufacturers have supported standards; those who have supported standards have done so from behind the scenes in order to maintain anonymity. The semi-conductor industry is highly competitive with several semi-conductor manufacturers producing computer chips, as a result if a semi-conductor manufacturer supports energy efficiency standard then the consumer electronics manufacturers might "penalize them" by purchasing their computer chips from competitors.

The formation of GTLG has allowed semi-conductor manufactures to publically support standards without the risk of being singled out and penalized by the consumer electronics industry.

> It gave us cover. The more members you have the less you have to highlight a specific company. – Advocate

GTLG was able to get a large majority of the semi-conductor industry to join their coalition. With the majority of the semi-conductor industry participating in the coalition the consumer electronics industry would be unable to penalize any one semi-conductor manufacturer for supporting the standard because all of their competitors also supported it. GTLG also became the public face of the semi-conductor industry during the rulemaking process by drafting the technical comments submitted to CEC. By acting as the public face for the semi-conductor industry, GTLG has become the target of the consumer electronics industry and not any specific semi-conductor manufacturer. In summary, through GTLG semi-conductor manufacturers could promote the consumer electronics standards without risk of being penalized by consumer electronics manufactures.

During the current rulemaking for computers, GTLG has submitted two technical comments to CEC providing them with data on how computer power supplies can be made more energy efficient by using advanced computer chips (Greentech Leadership Group, 2013a; Greentech Leadership Group,

2013b). Power supplies are an internal computer component that converts AC power into low-voltage DC power, which powers the internal components of a computer. Not all power supplies are the same, some power supplies are able to convert AC power to DC power more efficiently; as a result these computers need less power to operate and are more energy efficient. Power supply efficiency is rated by a voluntary certification program called 80 PLUS (Plug Load Solutions, 2015). There are five 80 PLUS certification categories, they are Bronze, Silver, Gold, Platinum, and Titanium (Plug Load Solutions, 2015); Bronze is the lowest efficiency category and Titanium is the highest efficiency category (Plug Load Solutions, 2015). Early in the rulemaking, CEC requested data from stakeholders in order to help them determine which minimum category they should mandate for computer power supply efficiency.

In order to make their decision CEC needed data on incremental cost, which is the additional cost to the manufacturer of building a computer with a more energy efficient power supply. Incremental cost data is important to standards setting because the regulatory agency has to make sure that the increased cost of a more energy efficient product is equal to or less than the amount of energy the purchaser of that product will save on their energy bill. GTLG members were in a position to comment on incremental cost, because the efficiency of power supplies depends on the type of computer chips they are built with. Power supplies built with more advanced computer chips will more efficiently convert AC power to DC power. As the manufacturers of advanced computer chips, GTLG could comment on the additional cost of more energy efficient power supplies.

In the draft standard CEC proposed setting the power supply requirement at the 80 PLUS Gold level (California Energy Commission, 2015); meaning that all workstations and small-scale servers sold in California would have to be manufactured with a power supply rated at the 80 PLUS Gold level or above. The data submitted by GTLG indicated that the standard could have been set at a more stringent level. GTLG was not the only organization who provided data on the incremental cost of more efficient power supplies; both ITI and CA IOUs also submitted data (Information Technology Industry, 2013; California

Investor Owned Utilities, 2013). ITI's incremental cost estimates were significantly higher than GTLG; in some cases ITI incremental costs were 4 to 9 times higher than GTLG (Information Technology Industry, 2013; Greentech Leadership Group, 2013A). In the end CEC used CA IOU incremental cost estimates (California Energy Commission, 2015), which were in between GTLG and ITI estimates (California Investor Owned Utilities, 2013).

It is difficult to measure the effect of the social movement-corporate coalition on the computer rulemaking, particularly since the rulemaking is still underway. Furthermore, CEC did not utilize data provided by GTLG members in the draft standard. What this case study provides is insight into how social movement-corporate coalitions can form when there is a high level of market competition between component manufactures. In this case, a majority of the semi-conductor industry had to participate in order for a coalition to from because it would reduce the likelihood of retaliation from product manufacturers.

Main Findings

Market position was the most influential factor affecting the formation of social movement-corporate coalitions between advocates and product manufacturers. Based on evidence from the air conditioner rulemaking and the television rulemaking, product manufacturers joined coalitions with the advocates to support standards because the standards would give them a market advantage over their competitors.

Goodman made their profits selling high volume, low cost air conditioners while their competitors made their profits selling premium air conditioners at lower volume with higher profit margins. The manufacturers of premium air conditioners (13 SEER and higher) used energy efficiency as a way of differentiating their premium products from baseline products in order to justify the additional cost. By setting the stringency of the air condition standard to the 13 SEER level, DOE was effectively

raising the baseline to the level of some premium air conditioners; as a result 13 SEER air conditioners could no longer be sold as more energy efficient. The cost of manufacturing more efficient air conditioners (air conditioners with efficiencies above 13 SEER) is greater because it requires more materials to produce. By raising the standard to the 13 SEER level manufacturers selling premium air conditioners would have smaller profit margins or would have to raise the prices of their premium air conditioners. Goodman, as a high volume, low cost manufacturer, would be unaffected by the standard giving Goodman a market advantage over their competitors.

Vizio is a manufacturer of high volume, low cost televisions. Vizio markets themselves as an environmentally friendly company that values energy efficiency; as a result Vizio's product line is highly energy efficient. Before CEC proposed the television standard a large majority of Vizio's television's already complied with the proposed standard or would comply with the proposed standard by the time it entered into force. Vizio's competitors were not in the same position; for several of Vizo's competitors large portions of their product lines would not comply with the proposed standard; as a result they would have to invest in redesigning their products and manufacturing facilities if the standard were implemented. This gave Vizio a market advantage over their competitors because Vizio would be unaffected by the standard and would not have to invest in redesigning their products and manufacturing facilities. Furthermore, Vizio could market themselves as more environmentally friendly than their competitors because they were the only manufacturer who supported the standard, giving Vizio a second market advantage.

Social movement-corporate coalitions formed between advocates and product manufacturers who are privately owned and less integrated into the trade association. Based on the air conditioner rulemaking and television rulemaking, both Goodman and Vizio were privately owned companies that were not highly integrated into their trade associations. Goodman was described by one of the advocates as a "black sheep" within the air conditioner industry. Furthermore, the televisions and air

conditioner manufacturers who were most vocally against standards were often publically owned and highly integrated into their trade associations. Privately owned companies have a higher level of autonomy than publicly held companies; it is possible that level of autonomy may play a role in the formation of social movement-corporate coalitions between product manufacturers and advocates.

Market position was also the most influential factor affecting the formation of social movement-corporate coalitions between advocates and component manufacturers. Based on evidence from the television rulemaking and the computer rulemaking, component manufacturers joined coalitions with the advocates to support standards because it would increase the size of the market for the products they produced.

3M is a manufacture of technologies that reduce the energy consumption of consumer electronics. They produced a technology called Vikuiti optical film, which can reduce the energy consumption of LCD televisions by 30%. This technology comes as a cost to manufacturers; as a result television manufactures would not build this technology into their products unless they needed to reduce the energy consumption of their products they produce. The California standard would require manufacturers to reduce the energy consumption of their televisions by 30%. Vikuiti optical film is a highly compatible and low cost option for manufacturers of LCD televisions to comply with the standard. Once the standard was implemented 3M would likely see a significant increase in demand for their Vikuiti optical film, as a result supporting the standard is in their market interest.

The semi-conductor manufacturers produce advanced computer chips that if built into consumer electronics would reduce their energy consumption. These computer chips come at a higher cost to the manufacturer than more basic computer chips; as a result consumer electronics manufacturers typically use the lower cost, basic computer chips in their products. The proposed California standard for computers would require that manufacturers use more energy efficiency computer power supplies, which are built with advanced computer chips. If the standard were

implemented the semi-conductor manufacturers would see a significant increase in demand for advanced computer chips, as a result supporting the standard is in their market interest.

Component manufacturers were willing to join a social movement-corporate coalition if the risk of retaliation from product manufacturers was low. Using evidence from the computer rulemaking, a majority of the semi-conductor manufacturers had to join GTLG before they would support the standard. The computer manufacturers, who are the customers of the semi-conductor manufacturers, were all against the standard. The semi-conductor industry is highly competitive with several manufactures producing the computer chips used in consumer electronics. If a single semi-conductor manufacturer promoted the standard, then the computer manufactures could have penalized them for their support by not purchasing their computer chips. The only way the semi-conductor manufacturers would promote the standard was after a majority of them joined the coalition, so that no they would not be penalized by the computer manufacturers for their support. Using evidence from the computer rulemaking, 3M was the only manufacturer producing Vikuiti optical film technology. While there were other technologies that television manufacturers could use to reduce the energy consumption of their LCD televisions, the technology produced by 3M was the most compatible and most cost effective option; as a result the television manufacturers would be unable to penalize 3M for their support of the standard because the television manufacturers need 3M's technology. This set of circumstances allowed 3M to join a coalition with the advocates to promote the standard without fear of reprisal.

Discussion

In this study, I investigate a social movement strategy based on leveraging divisions between corporations on different sides of a regulation to bring about changes in the behavior of corporations and industry. Under this strategy, social movements identify and form strategic alliances with corporations or industry sectors that would benefit from environmental regulation. Through these

strategic alliances social movements acquire resources that they would not otherwise have to help them achieve their desired outcomes. In this study I focus on the conditions under which these strategic alliances form. Based on my analysis I identified three key findings that influence participation in social movement-corporate coalitions:

- Business interest was the primary factor influencing both product and component manufacturers' participation in social movement-corporate coalitions;
- Component manufacturers are willing to join social movement-corporate coalitions if risk of retaliatory action by product manufacturers is low; and,
- Product manufacturers who are less integrated into their industry may be more willing to participate in social movement-corporate coalitions

These findings have the following implications for social movement theory, specifically the theory of the industrial opportunity structure. First, I investigate a form of industrial opportunity not previously researched in the social movement's literature, specifically the formation of social movement-corporate coalitions. Second, my findings further develop our understanding of the role that market share and market position play in creating industrial opportunities. More specifically my findings suggest that market characteristics not only make some corporation more vulnerable to social movement actions, but also make some corporations more receptive to collaboration with social movements. Furthermore, my findings identify a new industrial characteristic influencing the creation of industrial opportunities, specifically the level to which a corporation is integrated into their industry. Third, my findings expand our understanding of market and institutional relationships as they pertain to supply chain dynamics. By moving up the supply chain to look at the relationship between component manufacturers and product manufacturers, I show how component manufacturers can be leveraged as "industry pressure points" (Schurman, 2004) by social movement actors to further their goals. In the

following paragraphs I explore these findings in more detail and identify opportunities for further research.

Prior research has looked at how industrial characteristics create opportunities for social movements targeting corporations. This research has looked specifically at a corporation's market share and market position (Fligstein and McAdam 2011), the nature of the products a company produces (Shurman, 2004), and the importance of brand name and reputation to a company (King & McDonnell, 2012; Bartley & Child, 2014; King & Soule, 2007; den Hond & de Bakker, 2007). These scholars have found that industrial characteristics make some corporations more vulnerable to social movement action, which can make them a better target for social movements looking to change corporate policy (Schurman, 2004). While prior research has looked at corporate weaknesses and vulnerabilities, my research looks at market advantages created through regulation. When an industry undergoes government regulation some corporations may be in a position where they will benefit from the outcome of government regulation; under these circumstances social movements may be able to from strategic alliances with corporations to further their aims. These findings first confirm that market share and market position are highly dynamic industrial characteristics responsible for the creation of industrial opportunities. Furthermore, my findings demonstrate how industrial characteristics are responsible for more than one form of industrial opportunity. Not only do industrial characteristics influence corporate vulnerability to social movement action, but also influence corporate susceptibility supporting social movement goals. By identifying a new form of industrial opportunity I have opened the door to a new area of social movement scholarship.

Furthermore, I found that the two product manufacturers, Vizio and Goodman, who joined social movement-corporate coalitions where both privately owned and less involved in their industry's trade associations. This finding suggests that there may be another industry characteristic influencing the formation of social movement-corporate coalitions, specifically the level with which a corporation is

integrated into their industry. Corporations that are less integrated into their industry may be more willing to break ranks with the rest of the industry and join a coalition with social movement actors, therefor making these types corporations a better target for social movements looking to elicit corporate support for their cause. Prior social movement scholars have not looked at this industry characteristic; as a result this may be a fruitful area for further research. Scholars could also research relationships between corporations within an industry at the executive level, including common memberships in an industry association and policy planning groups as well as interlocking directorates.

Prior research has also looked at how economic and institutional relationships affect industrial opportunities; more specifically these scholars have looked at supply chain dynamics (Gereffi & Korzeniewicz, 1994; Schurman, 2004). While scholars have looked at social movements targeting corporations by leveraging their customers (Schurman, 2004) my study looks at targeting corporations by leveraging their suppliers. In other words, my study moves up instead of down the supply chain. In doing so I have identified a new opportunity in which component manufactures will form a strategic alliance with advocates to support government regulation. This finding demonstrates that economic and institutional relationships within an industry may present several opportunities for social movements.

Finally, prior research has looked at how corporate culture creates opportunities for social movements. These studies show how corporate culture can make some corporations more or less susceptible to social movement action (Raeburn, 2004; Weber, Thomas, & Rao, 2009). I had proposed a research question investigating the effect of corporate culture on the formation of social movement-corporate coalitions. My study did not produce data that allowed me to investigate the role of corporate culture on social-movement corporate coalitions making this an area of research still open to investigation.

In conclusion, these findings point toward several opportunities for additional research. The benefits of social movement-corporate coalitions for social movements are clear. By forming a strategic

alliance with manufacturers, advocates gain access to data and expertise which they used to strengthen their arguments for stringent energy efficiency standards. Furthermore the advocates diversified their coalitions by gaining a powerful proponent who could speak authoritatively to the benefits of the standard and the ability of the manufacturing community to comply with the standard. Prior research has looked at social movement cooptation by corporations (Jaffee, 2012). I did not look at cooptation in this study. It is possible that in addition to providing advocates with data and expertise social movement-corporate coalitions also result in social movement cooptation.

While it is difficult to quantify the degree of impact these social movement-corporate coalitions had on the final outcome it is clear that they had influence. The data and expertise provided by the manufacturers in the coalitions was utilized by CEC and DOE as part of their justifications for final standards. Furthermore, each of the case studies reviewed in this study occurred under highly contentious circumstances. In each case, except for the computer rulemaking which is still underway, the energy efficiency advocates were able to achieve all or a significant portion of their desired outcome. Based on my conversations with interviewees, social movement-corporate coalitions were a key factor in achieving the outcome. Further research could be done to quantify the impact of social movement-corporate coalitions on social movement outcomes.

Finally, more research could focus on social movement actors involved in government regulations. A significant amount of scholarship has contributed to the development of the industrial opportunity structure. However, the majority of this work has focused on social movements engaged in boycotts against corporations who commit labor abuses or produce products that are detrimental to the environment. These scholars have studied the selection of corporate targets (King & McDonnell, 2012; Bartley & Child, 2014; King & Soule, 2007; den Hond & de Bakker, 2007), the effects of boycotts on their targets (Mcdonnell & King, 2013; King & Soule, 2007), and the effects of boycotts on larger cultural perceptions (Van Dyke, Soule, & Taylor, 2004; Armstrong & Bernstein, 2007). Scholars have also studied

social movements engaged in private regulation; these scholars have looked at the role of institutionalizing private regulation (Etzion & Ferraro, 2010) and at cooptation of private regulation by corporations (Jaffee, 2012). Finally, scholars have looked at social movements occurring internally within a corporation, these scholars have primarily studied corporate diversity programs (Scully & Segal, 2002; Raeburn, 2004).

Further, scholars have studied the role of the environmental movement in the drafting of the North American Free Trade Act (NAFTA) (Evans & Kay, 2008), but these scholars did not utilize or build on the industrial opportunity structure. When developing his theory of strategic action fields, Neil Fligstine briefly discussed how government regulation of industry could present an opportunity for social movements (Fligstein & McAdam, 2011), but he did not fully develop this part of his theory or test it empirically. David Barron studied the effects of government regulation on corporations, but his research was focused more on the role of corporations and less on social movement opportunities (Baron, 1999; Baron, 2001). Finally, Rachel Shwom has looked at energy efficiency advocates involved in energy efficiency regulations, but her research has uncovered several important topics (Shwom, 2011; Shwom, 2014). In particular, Shwom's research indicates that collaboration between corporations and social movements have increased over time (Shwom, 2014). Further research could be done to investigate how social movement-corporate coalitions fit into this broader trend.

Studying social movements involved in a government regulation is well suited to contributing to the industrial opportunity structure. First, the government regulation of industry represents a sizable portion of contentious politics; for example social movement actors are engaged in government regulation of appliance and equipment energy consumption, industrial pollution, vehicle fuel efficiency, and product safety to name a few. At the time of writing this paper, these areas of contentious politics has been overlooked by scholars studying social movements targeting corporations. Secondly, government regulatory intervention causes industry disruption. By studying the role of social

movements in a destabilized industry we can understand how social movements might take advantage of destabilization, which can elucidate new tactics not previously studied by social movement scholars. It also allows us to contribute to organizational theory by understanding how industry actors within an industry structure respond to destabilization when social movement actors are present. Finally, government regulation is a highly transparent process; government agencies involved in regulation must document each step of the regulatory process, their analysis, stakeholder comments, and public meetings are all recorded and made publically available; as a result scholars can investigate the actions of social movements and industry during the rulemaking process, as well as their response to each other's tactics. Finally, regulatory outcomes can be measured providing a possible means of quantifying social movement success.

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APPENDIX: Interview Guides

Interview Guide: Energy Efficiency Advocacy Organizations (*including their technical consultants*)

Introduction: The purpose of the study is to understand the role of stakeholders in affecting the development and implementation of energy efficiency regulation. You are being interviewed because our research has identified you as someone who is knowledgeable about this issue. Let us review the informed consent document prior to beginning the interview. Do you consent to do this interview? I would like to record the interview. Do you agree to be recorded?

- Demographic Information:
    - What is your job title?
    - What organization do you work for?
    - How long have you worked in the energy efficiency industry?
    - What is your highest level of education?
    - What is your educational background?
- Can you tell me more about your job duties at _____? Can you tell me about how you are involved in energy efficiency regulation in your position at _____?
- What is the role of energy efficiency advocacy organizations during the rulemaking process? How do energy efficiency advocacy organizations engage industry and DOE regulators?
- What tactics do energy efficiency advocacy organizations usually take to affect the outcome of energy efficiency regulation?
    - What tactics did energy efficiency advocacy organizations take during the rulemaking for _____? Why were these tactics taken? Were there other tactics considered by energy efficiency advocacy organizations that were not taken? If so, why?
- What is the role of industry (trade associations and manufacturers) during the rulemaking process?
- What tactics does industry usually take to affect the outcome of energy efficiency regulation?
    - What tactics did industry take during the rulemaking for _____? Did industry's actions affect the tactics taken by energy efficiency advocacy organizations? If so, how?
- What is the role of DOE regulators during the rulemaking process?
- Besides the usual actions taken by energy efficiency advocacy organizations and industry, what other factors usually affect the outcome of energy efficiency regulation (e.g. political party in control of the presidency, political party in control of the congress, the technical complexity of the appliance undergoing regulation, and the market complicity of the appliance undergoing regulation)?
    - What other factors affected the outcome of the rulemaking for _____? Why?
- How would you define success as it applies to energy efficiency regulation? Is energy efficiency advocacy typically successful? What hinders energy efficiency advocacy when it is not successful?
    - How would you describe the outcome of the rulemaking for _____ in terms of success? Why?

Interview Guide: Industry (*trade associations and manufacturers*)

Introduction: The purpose of the study is to understand the role of stakeholders in affecting the adoption of energy efficiency regulation. You are being interviewed because our research has identified you as someone who is knowledgeable about this issue. Let us review the informed consent document prior to beginning the interview. Do you consent to do this interview? I would like to record the interview. Do you agree to be recorded?

- Demographic Information:
    - What is your job title?
    - What organization do you work for?
    - How long have you worked in the energy efficiency industry?
    - What is your highest level of education?
    - What is your educational background?
- Can you tell me more about your job duties at _____? Can you tell me about how you are involved in energy efficiency regulation in your position at _____?
- What is the role of industry (trade associations and manufacturers) during the rulemaking process? How does industry engage with energy efficiency advocacy organizations and DOE regulators?
- What tactics does industry usually take to affect the outcome of energy efficiency regulation?
    - What tactics did industry take during the rulemaking for _____? Why were these tactics taken? Where there other tactics considered by industry that were not taken? If so, why?
- What is the role of energy efficiency advocacy organizations during the rulemaking process?
- What tactics do energy efficiency advocacy organizations usually take to affect the outcome of energy efficiency regulation?
    - What tactics did energy efficiency advocacy organizations take during the rulemaking for _____? Did the actions of energy efficiency advocacy organizations affect the tactics taken by industry? If so, how?
- What is the role of DOE regulators during the rulemaking process?
- Besides the actions taken by energy efficiency advocacy organizations and industry, what other factors usually affect the outcome of energy efficiency regulation (e.g. political party in control of the presidency, political party in control of the congress, the technical complexity of the appliance undergoing regulation, and the market complicity of the appliance undergoing regulation)?
    - What other factors affected the outcome of the rulemaking for _____? Why?
- How would you define success as it applies to energy efficiency regulation? Is the outcome of energy efficiency regulation usually successful? What hinders a successful outcome?
    - How would you describe the outcome of the rulemaking for _____ in terms of success? Why?

Interview Guide: DOE Regulators (*including their technical consultants*)

Introduction: The purpose of the study is to understand the role of stakeholders in affecting the adoption of energy efficiency regulation. You are being interviewed because our research has identified you as someone who is knowledgeable about this issue. Let us review the informed consent document prior to beginning the interview. Do you consent to do this interview? I would like to record the interview. Do you agree to be recorded?

- Demographic Information:
    - What is your job title?
    - What organization do you work for?
    - How long have you worked in the energy efficiency industry?
    - What is your highest level of education?
    - What is your educational background?
- Can you tell me more about your job duties at _____? Can you tell me about how you are involved in energy efficiency regulation in your position at _____?
- What is the role of DOE regulators during the rulemaking process? How do DOE regulators engage with industry and advocates?
- What is the role of energy efficiency advocacy organizations during the rulemaking process?
- What tactics do energy efficiency advocates usually engage in to affect the outcome of energy efficiency regulation? For example, energy efficiency advocates have identified several tactics including submitting technical comments, filing lawsuits, pursuing legislation, engaging in negotiations with industry, cultivating manufacture and/or retailer allies, or gaining public support through the media. How would you describe the impact of these tactics on the outcome of energy efficiency regulation?
- What is the role of industry during the rulemaking process?
- What tactics does industry usually engage in to affect the outcome of energy efficiency regulation? For example, industry identified several tactics including providing data, submitting technical comments, engaging in negotiations with energy efficiency advocacy organizations, applying political pressure, or gaining public support through the media. How would you describe the impact of these tactics on the outcome of energy efficiency regulation?
- Besides the actions taken by energy efficiency advocacy organizations and industry, what other factors affect the outcome of energy efficiency regulation (e.g. political party in control of the presidency, political party in control of the congress, the technical complexity of the appliance undergoing regulation, and the market complicity of the appliance undergoing regulation)? What is the impact of these other factors on the outcome of energy efficiency regulation?
- How would you define success as it applies to energy efficiency regulation? Is the outcome of energy efficiency regulation usually successful? What hinders a successful outcome?