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Contents

CHAPTER CONTENTS

14 Communicating Energy in a Climate (of) Crisis

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We review energy communication, an emerging subfield of communication studies that examines the role of energy in society, and argue that it is dominated by a crisis frame. Whereas this frame can be productive, it can also be limiting. In response, we propose three areas for future energy communication research—internal rhetoric of science, comparative studies, and energy in everyday life—as starting points for rethinking and expanding energy communication. This expanded focus will continue to contribute to communication theory, add to interdisciplinary energy studies, and supply practical resources for the creation and deployment of just and sustainable energy futures.

Energy is foundational to the functioning of all human societies. Industrial and post-industrial societies rely heavily on the production of energy from fossil fuels and nuclear fission to power the infrastructure and technologies to which they have grown accustomed. Non-industrial and emerging societies, though perhaps not fully embedded in a large-scale system of energy production and consumption, similarly rely on energy to sustain everyday life. Heightened societal awareness of and controversies about the connections between energy security, economic growth, and energy systems

demonstrate these interconnections between energy and society (Tyfield & Urry, 2014). In this chapter, we focus on communication about energy as a significant and emerging subfield in communication studies that not only reflects opportunities for further theorizing the role of communication in diverse contexts but also positions communication research as a resource for addressing ongoing deliberation about the role of energy in society. Our review of communication scholarship on energy reveals a history of research that primarily responds to crises, from particular energy crisis events (e.g., Fukushima nuclear disaster 2011) to the more encompassing climate crisis. After reviewing this history, we call for new lines of research that expand beyond the crisis frame into a focus on energy as a central aspect of human society, even in times of perceived normalcy.

But first, a few preliminary definitions are in order. We define *energy* as power that may be used to operate the infrastructures of the human-built environment. Humans derive that power from resources such as fossil fuels, solar, wind, hydroelectric, nuclear, biofuels, and geothermal sources that are extracted and harnessed, prepared, and distributed in a cycle of energy production. We use the term *energy resources* to discuss sources of energy, *energy production* to describe the cradle-to-grave process whereby energy is supplied to human-built infrastructures, and *energy consumption* to refer to the processes wherein people use energy resources to power infrastructure, technology, and other activities. We define *energy communication research* as the study of symbolic practices surrounding material experiences with energy resources, production, and consumption, including related practices of research, development, deployment, and policy.

A guiding assumption of energy communication research, we argue, is that communication influences not only how people understand energy resources, production, and consumption but also the societal implications that emerge from those understandings. As we will demonstrate in this chapter, much of the *ad hoc* research on energy communication relates to the rapid rate of climate change that has resulted from industrial society's use of fossil fuels. Climate change, although confirmed through a long-standing scientific consensus (IPCC, 2015), currently "presents perhaps the most profound and complex challenge to have confronted human social, political, and economic systems" (Dryzek, Norgaard, & Schlosberg, 2011, p. 17). It can be seen as an existential crisis because of its ability to threaten the future of humanity if it is not curtailed (Klein, 2014; see also Bostrom, 2013 on existential risks). However, developing and implementing policies to mitigate climate change remains a significant political issue that has thus far eluded solution (Dryzek et al., 2011). The challenges posed by climate change, along with the threat that climate change mitigation policies may derail ways of life built largely on fossil fuel-based energy systems, constitutes the perfect storm for academic researchers across the disciplines, including communication.

Although much attention has been paid to the emerging study of climate change communication (e.g., Koteyko, Nerlich & Hellsten, 2015; Moser & Dilling, 2007), less attention has been paid to communication scholarship centered on energy. Since climate change mitigation requires fundamental transformations in how energy is understood, communication is one of the main challenges in creating and implementing different energy futures. Even though scholarship in energy communication extends beyond responses to climate change, it remains the most pressing exigency for research in energy communication. Climate change has also sparked research supporting normative arguments for the need to shift energy futures. Thus, like the field of environmental communication, energy communication is emerging as a crisis discipline (Cox, 2007). In addition to building and expanding communication theory, much energy communication research is concerned with ameliorating the climate crisis and developing more sustainable and just energy systems.

In addition to climate change, energy communication research has also responded to particular crisis events in energy production by analyzing the mediated, political, organizational, and public reactions to these disasters. Events that spurred energy communication research include: Three Mile Island, Exxon Valdez, Fukushima, and the BP oil spill (e.g., Cotton, Veil, & Iannarino, 2015; Farrell & Goodnight, 1981; Harlow et al., 2011; Rubin, 1987). For example, the 2011 Fukushima Daiichi nuclear disaster not only raised questions among publics and policy makers about the continued viability of nuclear power, but also provoked academic research that responded to the crisis (e.g., Kinefuchi, 2015; Kinsella, 2012a; 2012b). Indeed, Kinsella (2012b) organized a forum in *Environmental Communication* that highlights the crisis frame: "Communicative Action in Response to a Nuclear Crisis." As these examples reveal, recent energy communication research is responsive not just to the climate crisis, but also to seemingly isolated crisis events in which energy production is embedded.

Climate change represents a different type of crisis from these more bounded crisis events. The climate crisis is temporally and geographically expansive, impacting various publics and geographies continuously yet differently across an indefinite period of time. Even before climate change became a household word, scientists recognized and warned of the greenhouse effect, increasing fossil fuel emissions, and global warming. While the climate crisis may have only reached broad societal consciousness recently, climate charge has been a reality since as early as the 1800s when the first evidence of the Industrial Revolution's impacts on increasing CO_2 emerged (IPCC, 2015). Given the scale of the climate crisis, smaller crisis events in energy production are always embedded within the larger climate context. As such, the climate crisis has served as an overarching frame for energy communication research, which often evaluates whether energy entrenches or ameliorates the climate crisis.

Although the crisis frame animating energy communication research can be productive and valuable, it can also be limiting (Killingsworth, 2007; Senecah, 2007). Focusing on climate change and other crisis events may divert attention from questions regarding the role of energy in everyday life. Expanding and reframing energy communication research to address the everydayness of

energy serves as a starting point for research that examines how communication structures' understandings of energy policy enable and constrain past, current, and future energy deployment and function as a perceptual filter for larger social processes, such as how energy discourses are embedded within national mythologies (Jasanoff & Kim, 2009; Kitch, 2007). Energy communication research will have more impact and longer staying power if it addresses the values, dispositions, and issues that are routinely de-emphasized within crisis-oriented research. Enlarging energy communication research to include context-oriented research that expands beyond crises to everyday energy communication will contribute to communication theory, add a needed perspective to interdisciplinary energy studies, and supply practical resources for the creation and deployment of just and sustainable energy futures.

In the following pages, we begin by calling for the recognition of energy communication as a distinct subfield of communication studies. Next, we highlight three themes in the history of energy communication research that display the crisis frame. We then suggest three areas for further research that each offer ways of considering energy communication more broadly. We conclude by developing a context-responsive frame for energy communication research that encourages continued attention to the climate crisis as well as expansion into new areas of inquiry.

Communication Research on Energy

Although communication research about energy has existed since as early as the 1980s (e.g., Farrell & Goodnight, 1981; Medhurst, 1987), this research has accumulated in a largely *ad hoc* manner across an array of subareas in communication studies such as rhetoric, organizational communication, crisis communication, media studies, and public relations. Rather than drawing from a single area, this research combines the theoretical and practical resources of communication studies with topics related to energy resources, production, and consumption. Though research in disciplines such as sociology (e.g., McLachlan, 2010) and linguistics (e.g., Scollon, 2009) overlaps with communicative questions regarding energy, and while communication research has important implications for interdisciplinary research on energy, this review is primarily focused on bringing together the diverse research related to energy in the field of communication studies.

In undertaking our review of communication scholarship on energy, we found two things. First, energy is a common topic in communication research. Even in the absence of a defined subarea of energy communication, research on energy occurs regularly in communication studies' journals and books. Energy communication is a content-oriented subfield, similar to other subfields such as environmental communication, peace and conflict studies, and health communication that are held together across diverse theoretical and methodological traditions. In energy communication, as with these similar subfields, it is neither the medium of communication (e.g., interpersonal, social media, and television media) nor the type of communication (e.g., rhetorical, organizational, and persuasive) but the interest in energy content that determines the subfield. As such, energy communication cannot be contained within an extant subarea of communication. Although environmental communication is perhaps the closest subarea, energy communication exceeds the field of environmental communication and offers a wealth of material for communication research given energy's fundamental role in the function of human society.

Second, we found that the majority of energy communication research falls within what we call a crisis frame. While communication research on energy is not synonymous with the subfield of crisis communication, some of the research does overlap since perceived crises often motivate energy communication research. This research does not only study the communicative dynamics of crises, but societal crises over energy and climate change undergird the communicative dimensions of energy resources, production, and consumption. The crisis frame materializes in two ways. The first set of research examines the communicative dynamics of specific energy-related crises through a variety of lenses. The type of crisis ranges depending on the energy resource, but oil and nuclear energy are particularly prominent since both have precipitated major crisis events. Oil-related crises include large-scale oil spills, such as the Exxon Valdez disaster (Dyer, Miller, & Boone, 1991; Hearit, 1995; Peterson & Peterson, 1996; Sellnow, 1993; Williams & Olaniran, 1994; Williams & Treadaway, 1992), the BP Deepwater Horizon disaster (Breeze, 2012; Chewning, 2015; Choi, 2012; Harlow et al., 2011; Muralidharan, Dillistone, & Shin, 2011; Russell & Babrow, 2011; Schultz, Kleinnijenhuis, Oegema, Utz, & van Atteveldt, 2012; Spangler & Pompper, 2011), and lesser known spills (Jeong, 2009; Liska, Petrun, Sellnow, & Seeger, 2012; Maresh & Williams, 2007, 2009). In terms of nuclear energy, the disasters at Chernobyl (Eribo & Gaddy, 1992; Gorney, 1992; Luke, 1987; Young & Launer, 1991), Three Mile Island (Dionisopoulos & Crable, 1988; Farrell & Goodnight, 1981; Rubin, 1987), and Fukushima (Cotton et al., 2015; Kinsella, 2012a; Tateno & Yokoyama, 2013; Visschers & Siegrist, 2013; Yeo et al., 2014) provoked much research within (and beyond) the field of communication. This second set of research comes from an underlying normative perspective that assumes a need to change our energy choices (often away from fossil fuels) to ameliorate the existential crisis of climate change (Klein, 2014). Under the pressures of climate change, the entire field of energy production and policy is in a transformative upheaval. Although we present these two manifestations of the crisis frame as discrete, there is overlap between them.

The Crisis Frame in Energy Research

The crisis frame is a dominant theme in communication research on energy. In this section, we offer a review of previous energy communication research that highlights the many theories and methodologies (crossing many established subareas of communication) that are brought to bear in analyses of the communicative dynamics of energy. In particular, we examine three noteworthy

themes that emerged from our review: 1) the role of media in covering energy crises; 2) analyses of corporate communication surrounding crises; and 3) discourses of decision-making about energy in the context of crises. These themes do not correspond with a particular subarea of communication (e.g., media, organizational). Taken together, they highlight how the crisis frame, in its two overlapping manifestations, plays out in energy communication research.

Media Coverage of Energy Crisis

Crises in energy resources, production, and consumption have been a common topic or case study for research in media studies (e.g., Doyle, 2011; Eklöf & Mager, 2013; Evensen, Clarke & Stedman, 2014; Feldpausch-Parker, Ragland, et al., 2013; Feldpausch-Parker, O'Byrne, et al., 2013; Feldpausch-Parker & Peterson, 2014; Kitch, 2007; Kittle Autry & Kelly, 2012; Langheim et al., 2014; Monani, 2008; Skjølsvold, 2012; Smith & Lindenfeld, 2014; Stephens, Rand, & Melnick, 2009) and journalism (e.g., Abe, 2013; Bacon & Nash, 2012; Burt, 2011; Erfle & McMillan, 1989; Harcup, 2011; Kim, Besley, Oh, & Kim, 2014; Vraga, Tully, Akin, & Rojas, 2012; Watson, 2012; Wood, Shabajee, Schien, Hodgson, & Preist, 2014). These studies address the role of various media—newspapers, social media, websites, and films—in communication about particular crises and the broader crisis of climate change.

Following major crises in energy production or consumption, researchers routinely study the relationship between media and specific crises. For example, after the Chernobyl nuclear disaster, studies examined how the crisis was communicated by news media and how that coverage influenced public understanding and public opinion about nuclear power (Eribo & Gaddy, 1992; Gorney, 1992; Luke, 1987; Young & Launer, 1991). Gorney (1992), for instance, argues that media coverage of the Chernobyl crisis was less sensationalistic than she expected, even with the use of loaded words such as "radiation" and "meltdown." Notably, while there are a number of articles addressing Chernobyl in the late 1980s and early 1990s—soon after the crisis event in 1986—articles on this topic trail off in favor of different crisis events. Currently, there is an uptick in research examining the relationship between the Fukushima crisis and media (Binder, 2012; Friedman, 2011; Lazic & Kaigo, 2013; Utz, Schultz, & Glocka, 2013; Wei, Lo, Lu, & Hou, 2015). For example, Utz, Schultz, and Glocka (2013) examine the role of social media in crisis communication about Fukushima and argue that the media type has a stronger effect than crisis type on public perception.

In addition to studies that address specific crisis events, energy communication research approaches the relationship between energy and the larger climate crisis as it is presented to the public through media. Framing analysis is a dominant approach for making sense of news media coverage of energy processes. We use the term "framing" to describe how humans communicate about reality through a series of lenses or perspectives. As Horsbøl (2013) states, "Frames are constitutive of the construction and interpretation of issues" (p. 23). Drawing on a diversity of approaches to framing literature (Druckman & Bolsen, 2011; Entman, 1993; Gamson & Modigliani, 1989; Nisbet, Maibach, & Leiserowitz, 2011), these studies show how news media construct narratives related to energy futures in the context of the climate crisis. Some of these studies examine newspaper coverage of various energy sources, from US coverage on biofuels (Kim et al., 2014), to smart grids (Langheim et al., 2014), to wind (Stephens et al., 2009), to carbon-based energy sources (Feldpausch-Parker & Peterson, 2014; Koteyko, Thelwall, & Nerlich, 2010) and alternative energy in general (Haigh, 2010). For example, Stephens et al. (2009) argue that despite wind power's critical importance to climate change mitigation, news media coverage of wind's contribution to climate mitigation has been limited. In another example, Oltra, Delicado, Prades, Pereira, and Schmidt (2014) reveal that Internet-based media coverage of nuclear fusion presents it as a viable solution to world energy problems in the context of climate change. These studies assume a crisis lens by examining competing frames in the context of the crisis over energy futures in relation to climate change.

Other energy communication research examines media frames to understand how media influence public opinion of energy. These studies of public opinion are contextualized by both specific crisis events and the larger need to examine which energy resources are perceived to be best for addressing the climate crisis. For example, Gamson and Modigliani (1989) analyze the interpretive frames of nuclear power—pronuclear progress, energy independence, the antinuclear soft path, and the devil's bargain—from 1945 to 1989, reflecting on how these frames respond to particular crisis events in nuclear power such as Three Mile Island and larger societal discourses about energy futures. Butler, Parkhill, and Pidgeon (2011) update these interpretive frames in a post-Fukushima era. These mediated interpretive frames are associated with policy implications as they relate to public acceptance of energy technologies within a context of both crisis events and climate change. Bickerstaff, Lorenzoni, Pidgeon, Poortinga, and Simmons (2008), for example, categorize the public's opinion of linking nuclear energy to climate change as "reluctant acceptance," which in turn has implications for energy policy.

Beyond characterizing the role of media frames in public opinion and policy outcomes related to energy, other studies take a critical normative approach premised on using communication research to explicitly contribute to ameliorating the climate crisis (see Cox, 2007 for a discussion of how crisis-oriented research is normative). Smith and Lindenfeld (2014), for example, integrate climate change media analyses into the growing corpus of transdisciplinary research focused on finding solutions to climate change and the crisis it presents. Their analytical efforts, characterizing frames and ideological narratives within various media, are meant as contributions to effectively aiding such solutions.

Corporate Communication about Crisis

A second theme of energy communication research analyzes the discourse of energy corporations in response to or in anticipation of future crises

surrounding energy resources, production, and consumption in the context of the ongoing climate crisis. These studies draw heavily from the theoretical resources of organizational communication, crisis communication, and public relations (e.g., Barbour & Gill, 2014; Chewning, 2015; Choi, 2012; Collis, Bianco, Margaryan, & Waring, 2005; Cotton et al., 2015; Dyer, Miller, & Boone, 1991; Hynes & Prasad, 1997; Idemudia, 2009; Kinsella, 1999; 2014; Livesey, 2002; Miller, 2010; O'Connor & Gronewold, 2013; Prasad & Mir, 2002; Sellnow, 1993; Spangler & Pompper, 2011; Vandenberghe, 2011), but also expand across other subareas of the field. Studies range from promoting best practices for corporate communication in response to crises to critical studies that interrogate corporate discourses for complicity within larger structures that sustain the climate crisis.

Regarding the former, numerous studies examine specific energy crises to draw out best (and worst) practices for corporate communication. Breeze (2012), for example, assesses the justification strategies used by corporate actors to legitimate British Petroleum (BP) after the 2010 Deepwater Horizon oil catastrophe in the Gulf of Mexico. Case studies of this sort show, for instance, how strategies should differ at varied stages of crises and how strategies useful in one instance may be less successful in others (Williams & Olaniran, 1994; Williams & Treadaway, 1992).

In addition to research that examines and categorizes the strategies employed by particular institutions in response to an energy crisis event, other research in this area emphasizes the importance of an anticipatory model for crisis communication so that energy companies' communications in times of crises are interpreted more favorably (Olaniran & Williams, 2008). For example, Cotton et al. (2015) demonstrate how TEPCO, the Japanese power company held responsible for the Fukushima Daiichi disaster, failed in their post-crisis attempts at "renewal"—discourse designed to rebuild its reputation through a focus on rebuilding in the future—due in part to unsuccessful pre-crisis framing strategies. Along these lines, research on corporate energy communication often examines best practices for creating a positive image that can then be relied on in times of crisis. Miller's research, for instance, focuses on how public audiences perceive marketplace advocacy—designed to encourage public acceptance for a product, service, or industry sector—in the coal industry (Miller, 2010; Miller & Lellis, 2015).

Some scholars also take a critical normative stance in their analyses of corporate energy marketing campaigns, particularly fossil fuels. Unlike research that focuses on best practices for crisis communication in specific crisis events, this research takes climate change as an underlying crisis that calls for research examining corporate efforts to perpetuate the status quo or for research that advocates for alternate energy futures that would lessen the impact of climate change. For example, Bsumek, Schneider, Schwarze, and Peeples (2014) offer the term "corporate ventriloquism" to explain how coal corporations appropriate non-corporate discourses through the persona of "dummy" grassroots organizations to align corporate positions with cultural

values and promote coal as a "clean" energy option. They call for further interrogations of how energy corporations present coal and other fossil fuels as common sense, despite what the authors perceive to be a clear need to move away from fossil fuels. In another study that critiques the rhetoric of energy corporations, Peeples, Bsumek, Schwarze, and Schneider (2014) argue that corporate discourse from the coal industry combines apocalyptic rhetoric with ridicule (or the burlesque frame as they call it) to denigrate environmentalist opposition. Smerecnik and Renegar (2010), Plec and Pettenger (2012), and Cozen (2010) similarly criticize fossil fuel advertising campaigns, elaborating on the ideological undercurrents in these campaigns that maintain the status quo of fossil fuel production and worsen climate change. These critical analyses often attempt "to help critics observe the ideological work accomplished by" energy corporation communication strategies (Bsumek et al., 2014, p. 27). These studies not only critically analyze these strategies but also advance normative desires to generate energy futures that move away from the climate crisis. For instance, while Plec and Pettenger (2012) focus on compliance-gaining strategies and appeals to expertise in ExxonMobil campaigns, they also explicitly argue for a move toward a reduction of energy consumption in light of the climate crisis.

Decision-Making in the Context of Crisis

Still other studies focus on decision-making related to energy production in times of crisis. The overarching urgency of the climate crisis informs contemporary decision-making about energy technologies due to the perceived necessity of the rapid deployment of low-carbon energy technologies to address climate change (Fleishman, De Bruin, & Morgan, 2010; Stephens, Wilson, & Peterson, 2015). Such studies explore how various stakeholders come into play when a decision must be made about energy technologies.

Publics make up an important stakeholder group in energy policy decision-making. Public attitudes and beliefs can have a profound impact on ensuing deliberation, but those attitudes and beliefs are often formed in relation to crisis events and acceptance (or rejection) of the climate crisis. Regarding the former, particular crisis events can influence, trigger, or reinforce public opposition to a particular technology. The Fukushima crisis, for example, caused several stakeholder groups to re-evaluate their position on nuclear power, often creating an assessment that weighed the risks of nuclear disasters against the perceived benefits of nuclear power as a low-carbon alternative to fossil fuels (Besley & Oh, 2014; Butler et al., 2011; Juraku, 2013; Kinsella, 2012b; Kittle Autry & Kelly, 2012; Visschers & Seigrist, 2013).

Absent a major crisis event, public perceptions of energy resources are still tied to broader discourses about climate change, low-carbon energy technologies, and the need to transform energy policy to prevent future crises. When looking at newer energy technologies that may not have experienced a major crisis event, public understanding of science (PUS) and public perception

research focus on making sense of how publics comprehend new energy technologies and their potential roles in intensifying or mitigating climate change. While each type of energy resource involves some questions of public acceptance, research in this area primarily focuses on public opinions regarding new(er) technologies, such as carbon capture and storage (e.g., Bradbury et al., 2009), geothermal (e.g., Gross, 2013), wind (e.g., Aitken, 2010b; Swofford & Slattery, 2010), and biofuels (e.g., Cacciatore, Binder, Scheufele, & Shaw, 2012; Cacciatore, Scheufele, & Shaw, 2012; Fung, Choi, Scheufele, & Shaw, 2014; Raza, Kumar, & Singh, 2011; Van de Velde, Verbeke, Popp, & Van Huylenbroeck, 2011; Vraga et al., 2012). Much of the research on wind energy, for example, evaluates how negative public perceptions of wind energy influence the political viability of this low-carbon climate mitigating energy resource (e.g., Aitken, 2010a; Devine-Wright, 2009; Fischlein et al., 2010; Fischlein, Feldpausch-Parker, Peterson, Stephens, & Wilson 2014; Fischlein, Wilson, Peterson, & Stephens, 2013; Maillé & Saint-Charles, 2014; Stephens et al., 2009; Swofford & Slattery, 2010; Wolsink, 2006). Yet, this research is not only focused on new(er) low-carbon energy resources. Even in light of the role of fossil fuels in worsening the climate crisis, there has been a rise in unconventional forms of fossil fuel extraction such as hydraulic fracturing ("fracking"; Newell & Raimi, 2014). Research has focused on understanding public opinion and understanding about this controversial energy production technology (e.g., Boudet et al., 2014; Clarke et al., 2015).

Because energy production requires land use, it often provokes political crises related to the different ways in which space is inhabited and animated. Siting locations for power plants, wind farms, and waste facilities is a significant issue that raises conflicts among stakeholders across a variety of energy resources. The ubiquitous Not-In-My-Backyard (NIMBY) framework oversimplifies the many factors at play in siting decisions as well as broader public support for energy technologies (Aitken, 2010a; Devine-Wright, 2005; 2009; Endres, 2012; Sjöberg & Drottz-Sjöberg, 2001; Wolsink, 2000; 2012). Debates over siting practices are particularly intense for wind and nuclear technologies. In the case of wind energy, research has examined how local populations react to locating wind farms in their areas (Aitken, 2010a; Devine-Wright, 2005; Maillé & Saint-Charles, 2014; Wolsink, 2000). For example, Maille and Saint-Charles (2014) examine how a wind farm developer's communication strategies affected the diffusion of information in the community and ultimately led to opposition to the project. The claim that opposition is rooted in the NIMBY phenomenon fails to adequately describe how opposition developed in this community.

Stakeholder tension is also apparent in communication research on nuclear siting practices. While the nuclear renaissance discourse calls for more nuclear power to respond to the exigencies of climate change, the renaissance has not yet materialized in many tangible proposals for new sites (Kinsella, Kelly, & Kittle Autry, 2013). Yet, in countries like South Korea that are actively pursuing nuclear power, the issue of siting remains significant. Song, Kim, and Han

(2013), for instance, highlight that perceived efficacy positively influenced while perceived risk negatively influenced social acceptance of nuclear plants in South Korea. Moreover, Juraku (2013) provides a historical account of Japan's decision to build multiple plants on single sites to avoid greater public dissent. Yet, this study also illustrates the relationship between siting decisions and future crises by pointing out that while the Japanese strategy of multiple power plants on one site minimized dissent in the short term, the Fukushima disaster reveals the future risks and intensified crisis events involved in such a decision. Thus, siting becomes an integral part of the crisis frame, particularly when poor siting decisions precipitate and exacerbate crises.

What is even more contested in terms of nuclear siting is the location of high-level nuclear waste sites. Much research directly responds to the international crisis of nuclear waste (Clarke, 2010; Endres, 2009a; 2009b; 2009c; 2012; 2013; Fan, 2006a; 2006b; Freudenburg, 2004; Peeples, Krannich, & Weiss, 2008; Ratliff, 1997). For example, Clarke (2010) and Endres (2009c; 2012; 2013) have analyzed the (often silenced) rhetorical arguments of Native American stakeholders in nuclear waste siting decisions in the US. As with wind, these cases reveal that siting decisions are more complicated than a NIMBY framework would suggest, with some groups opposing and some groups openly calling for nuclear waste facilities on or near Native American lands. Yet, in all cases, discussions about nuclear waste siting and its relevance to national interests further the crisis framing of energy communication.

Energy decision-making also features discussions of risk (e.g., Boyd et al., 2013; Kinsella, 2012a; Kuchinskaya, 2010; Remillard, 2011; Russell & Babrow, 2011; Song et al., 2013; Tateno & Yokoyama, 2013; Yeo et al., 2014). As Kinsella (2012a) notes, risk communication "fundamentally constitute[s] the world on which decision-makers, organizations, and communities act" (p. 251). Discussion of risk (of major crisis events) is particularly prominent in the case of nuclear energy. Mirel (1994) argues that, for nuclear energy where the risks are potentially catastrophic, risk communication teaches us that the purpose of communication is not persuasion but presenting information to let people come to their own position. The Fukushima crisis provoked an uptick in research on risk perception among publics and stakeholders. For example, Tateno and Yokoyama (2013) focus on Japanese publics' perceptions of risk post-Fukushima that exposed a lack of trust in experts and officials. In the US context, Yeo et al. (2014) examine how risk perceptions after Fukushima varied across different ideological sub-populations. Although risk communication is prevalent in nuclear energy, it also relates to other energy resources, such as analysis of public risk perception in a large carbon capture and sequestration demonstration project (Boyd et al., 2013).

Broadly, energy communication research calls forth expertise from a variety of different communication theories and methodologies. In this review, we have shown that research in energy communication cannot be contained within an existing communication subfield, such as environmental or crisis communication. Rather, what binds communication research on energy is its

responsiveness to perceived energy-related crises, both specific crisis events and the climate crisis. Further, we organized extant energy communication research in terms of the most dominant themes in the crisis frame. While these three themes cannot cover all energy communication research, they do reveal the varied ways in which the majority of this research responds implicitly or explicitly to crises. Next, we discuss how the crisis-frame can be limiting for the field of energy communication.

Moving Beyond Crisis: Energy in Everyday Life

Operating under the crisis frame, energy communication research has missed out on fully exploring the role of energy in everyday life. In much of the industrialized world, energy is assumed to be available, reliable, and affordable. Thus, people often overlook energy in its mundanity and are drawn to it only in times of crisis. In order to ameliorate this gap we identify three areas of future research, each of which points to some of the more commonplace aspects of energy. Not all of these studies completely extricate themselves from the crisis frame (indeed, climate change is an ever-present existential crisis from which it is hard to escape), but they do show some ways of moving away from a reactive stance to a proactive one that is focused on the role of energy in everyday life.

Internal Rhetoric of Energy Science

Focusing on the internal expert-to-expert communication practices among energy technology professionals—for example, conference talks, face-to-face conversations, and laboratory cultures—could shed light on the backstage processes of producing energy technology. In the everyday circuits of communicative exchange between energy scientists and engineers, we might make sense of the ways in which public discourses about energy (which have been the primary focus of the research we reviewed) relate to the discourses of the technoscientists who research and develop commercial applications of energy technologies. These expert-to-expert rhetorics are especially critical as they significantly shape the future of particular aspects of energy resources; production, and consumption. Rhetorical scholars, however, have concentrated more on the ways in which public audiences understand the science behind particular energy technologies. Lyne and Miller (2009) argue, "Rhetoricians usually feel most comfortable in the spaces of civic and cultural life and may be reluctant to take on the internal discourse of a natural science or other discipline outside their own" (p. 170). By moving past this reluctance to grapple with the internal rhetorics of energy scientists and engineers, we argue, communication scholars could add substantially to our collective understanding of how energy systems are developed, deliberated, and deployed through communication.

Although few energy communication researchers have explored the internal rhetoric of energy scientists (e.g., Endres, Cozen, O'Byrne, & Feldpausch-Parker, 2013), rhetorical scholars have long recognized the value of studying

the internal rhetorics of science. These expert-to-expert modes of persuasive communication significantly shape the symbolic and material conditions of life beyond the laboratory and the field (Wander, 1976). By exploring some aspects of internal rhetoric, scholars have shed light on the ways in which scientific knowledge is produced. These communicative exchanges range from the rhetorical figures of science (Fahnestock, 1999) to argumentative patterns (Prelli, 1989) to the constitutive aspects of science rhetoric (Ceccarelli, 2001) to the formation of collaborative objects (Barley, Leonardi, & Bailey, 2012), and from citizen science projects (Hartman, 1997) and rhetorical interactions between scientists and policy makers (Besel, 2011) to the role of analogies in the laboratory (Graves, 1998).

In addition to providing nuanced understandings of how scientific knowledge about energy is produced, research on the internal rhetorics of energy scientists and engineers can avoid some of the traps of crisis-driven research. By shifting their attention away from publicly circulating texts and onto the less formal, rhetorical exchanges between scientists and engineers, scholars can grapple with how, for example, prudential (pragmatic, ethical, and value-based) reasoning influences the production of scientific knowledge in energy technology systems. Although appeals to particular values may not appear explicitly in scientific texts, they are certainly present in the internal rhetorical exchanges between scientists that take place in hotel lobbies and office corridors, at conference receptions and departmental dinner parties (Heath, 1998; Krauss, 2011; Lorenz-Meyer, 2012; Marcus, 1995). Everyday, mundane scientific practices like lab meetings, casual conversations, and informal research presentations are richly rhetorical scenes of knowledge production where these prudential forms of reasoning can be glimpsed and appreciated. In the case of energy science and engineering, which has a close relationship to ongoing societal and policy deliberation about energy, such examinations might yield significant insight into whether and how topics in internal rhetoric make their way to public discourse.

Research about the internal rhetoric of scientists has already yielded important insights. For example, in *Science in Action,* Latour (1987) traced many of the social, political, and economic forces that impinge upon the everyday actions of scientists and engineers. In our current research, we are examining various forms of reasoning employed by scientists and engineers working on nuclear, wind, and carbon sequestration technologies. Exploring not only the technical but also the prudential forms of reasoning engaged by scientists in these fields of study, we are undertaking ethnographic research at professional conferences, in-depth interviews with scientists and engineers, and archival and textual analyses of internal rhetorics. Focusing on these aspects of knowledge production enables researchers to uncover and critique the ways in which energy scientists deploy certain forms of reasoning in some contexts and not others. In doing so, they construct a more complete picture of the scientific process and, in turn, enable a broader view of how science impacts society.

By shifting attention to the everyday practices of scientists and engineers in energy technology fields, especially the informal rhetorical exchanges that shape the day-to-day rhythms of knowledge production, we argue that energy communication scholars can fill some of the gaps in the crisis frame and open up new paths of understanding. When energy science is viewed from this perspective, it is no longer possible or practical to overemphasize the role of publicly circulating texts at the expense of the ordinary rhetorical exchanges that always and importantly shape the conditions of possibility for broader public understandings of the role of energy in society. Although we have focused primarily on the rhetoric of science in this section, we suggest that it would also be productive to examine expert-to-expert communication practices among energy scientists and engineers from other communication approaches, such as organizational communication, science communication, as well as other methodological approaches, such as quantitative social scientific research.

Comparative Studies

Most of the studies we reviewed focus on a particular energy resource (e.g., wind, nuclear, coal, etc.). Comparative studies across energy resources would allow energy communication researchers to discern broader themes across the energy landscape. Comparative studies can show how energy—regardless of the specific type—influences society and everyday life. Although the climate change crisis has provoked some comparative studies that transcend particular crises (Pralle & Boscarino, 2011), many of these studies still situate energy communication as a reaction to crises rather than an everyday part of life.

Everyday energy production and deployment occurs in an energy resource ecosystem. Stephens, Peterson, and Wilson (2014) developed a framework for analyzing the multiple sociocultural factors in play when people interact with the electric grid. They argue that, because actors engage in multiple ways and are interested in different aspects of electricity system change, one of the most valuable contributions that communication scholarship offers is its examination of the symbolic interactions through which individual (and corporate) members of social systems attempt to understand and influence each other. For example, electric utilities are in the business of producing and selling electricity, so changes in markets become central concerns. Government actors are responsible for ensuring that the system serves the public interest, which includes the complicated process of identifying that interest within particular locations and times. Some actors may see themselves as consumers who simply want reliable and high quality power that is easily affordable. Still others, the early adopters of new technologies, enthusiastically embrace "smart" technologies that enable them to play a more active part in maximizing the role played by renewable energy resources such as wind and solar. Expanding energy communication scholarship beyond the crisis frame opens additional opportunities for contributing to theory and practice, both within the communication discipline and across the social and policy sciences.

From an infrastructure perspective, Todd and Wood (2006) illustrate how the grid combines various resources into one overarching channel: the continuous flow of electricity. Everyday interactions with energy are not necessarily experienced in terms of crisis. Nor are they experienced in terms of a particular (or single) form of energy. Rather, in developed countries energy is experienced in terms of a grid system that activates when one flips a switch. The act of turning on a light may not signal a particular energy resource for the actor. Further studies of the grid and people's everyday experiences with energy could reveal how people can simultaneously carry strong feelings about particular energy resources but also not know which energy resources come together when they turn on the lights. Comparative research can also show how arguments about energy in society map across geographic, cultural, economic, and political contexts. Reiteration of themes across resource types, as well as across stakeholder groups, could suggest common modes of understanding energy. It may also suggest the chronic persistence of energy production and consumption in peoples' day-to-day lives: whether through siting and living near a production plant or waste repository, or the uses of energy resources in one's everyday consumption habits.

Finally, comparative studies of energy can show how support for one energy resource can entail support for, or opposition toward, another energy resource. For example, nuclear energy proponents may support or contest the development of other renewables, depending on how that other energy resource impacts nuclear power production. Comparative aspects can also open up considerations of how particular energy resources are viable solutions in some but not all cases. Nuclear power production, for example, is an international market with regionally specific determinants of its deployment (Jewell, 2011). These examples suggest that thinking about energy resources from a comparative perspective has implications for the composition of energy policy. Comparative studies of energy, coming from a diverse mix of theoretical and methodological approaches in communication, encourages movement away from the crisis frame by (re)centering the fundamental role of energy as a heuristic that guides the conduct of everyday life as opposed to thinking about particular energy resources.

Energy in Everyday Life

Theorizing energy in everyday life not only moves beyond the crisis frame, but also focuses attention on the broader relationships between current energy production practices and societal structures that assume a steady or increasing demand for energy. The crisis frame for energy communication selects, reflects, and deflects (Burke, 1966) the way people think about energy in their everyday lives. Speaking about energy primarily in terms of risks and crises then calls for actions that respond to risks and crises (Kinsella, 2012a; Russell & Babrow, 2011), conditioning people to think about energy only when disaster strikes. A shift away from the crisis frame can encourage people to reflect on the

way that energy production is a ubiquitous but mainly hidden process in the everyday production and maintenance of society, the human-built environment, and infrastructural networks. While the chronic climate crisis could also be characterized as a ubiquitous and everyday reality, it is more likely to be seen in light of the crisis events it produces as well as particular climatic crisis events, such as the "snowpocalypse" and Hurricane Katrina (Hilfinger Messias, Barrington, & Lacy, 2012). That is, even though the chronic crisis of climate change needs to be addressed, much of the research that comes out of energy communication responds by examining the smaller crisis events that are indicative of the larger climate crisis. We contend that more research on the everyday nature of energy production in individual lives and collective society is also needed to address the everyday realities of climate change and global warming.

We encourage energy communication scholars to follow a similar trajectory as the one taken in the special issue "Energy & Society" in the journal *Theory, Culture & Society* (Tyfield & Urry, 2014). This special issue raises important questions about power and the structuring influence of energy in society. Many of its essays focus on shifts in everyday practice as starting points for shifting energy futures toward more just and sustainable energy production practices. For instance, Shove and Walker (2014) consider energy through its everyday social practices and Sheller (2014) considers the history of energy's mutual constitution with industrial development. Such emphases point to how energy is enmeshed in larger social processes and examine how social change can occur given the pervasive interrelationship between energy and contemporary society. For example, Tyfield (2014) argues that moves toward alternative energy in light of the chronic climate crisis actually contribute to a resurgence in coal production because coal is positioned as a stable energy resource that is needed when renewables falter. This position assumes that current or increased levels of energy production are a constant need to fuel contemporary society. It also fails to challenge the underlying premise that society needs forms of energy production that continue the status quo both for individuals wanting to maintain their current lifestyles and for societies with energy-intensive infrastructures already in place. As Shove and Walker (2014) argue, larger societal changes that minimize demand for energy may enable us to envision and implement more just and sustainable energy practices and futures that can also address climate change.

Likewise, energy communication research would benefit from more attention to and reflection on mundane individual and societal energy consumption needs and desires. To interrogate how energy exists in everyday practice is also to ask questions that are less focused on particular energy crisis events and particular types of energy and more focused on the mundane social practices that make up energy demand in times of relative normalcy in energy production. In their special issue on climate change communication, Carvalho and Peterson (2009) highlight essays that emphasize "the importance of research that looks beyond traditionally defined texts, into how they are embedded in social life and are subject to varying processes of interpretation" (p. 132).

Because communication both reproduces ways of knowing and opens up new possibilities, communication scholars are uniquely positioned to theorize the development of new energy futures in proactive ways. It could be argued that this focus on everyday energy does not move beyond a climate crisis orientation in energy communication. Yet, the current link between the chronic climate crisis and particular crisis events that we have articulated in this essay suggests that there is room for alternative lines of research that focus on addressing climate change through shifting attention from episodic crisis events to the everyday nature of climate change and its relationship with everyday energy practices. For example, Schneider and Miller (2011) offer alternative hedonism—an "approach to ethical practice that is concerned with the 'good life' that is not based on an unexamined consumer identity or overwork" (p. 468)—as a positive and pleasurable alternative to crisis-oriented approaches that rely on fear of the apocalypse. If we are to address the existential crisis posed by climate change, then we need to address everyday habits and ways of living that fall under the larger societal systems, such as capitalism (Klein, 2014), and offer new options such as alternative hedonism.

Conclusion

In this chapter we argued that energy communication is a significant emerging area of study for communication scholars. Yet our review revealed that much extant scholarship in energy communication is reactive to particular crisis events or more broadly to the climate crisis. Although the crisis frame is useful for producing applied research that responds to tangible problems, it is also limiting in terms of thinking through the everyday nature of energy production and consumption. We proposed three directions for future research that are more attentive to mundane communicative practices that often go unnoticed. By studying the internal rhetoric of scientists and engineers, by engaging in comparative studies, and by exploring the roles of energy in society, energy communication scholars can more proactively account for how energy impacts ordinary life and offer different pathways towards just and sustainable energy futures.

Although we have highlighted some of the constraints of a crisis-oriented approach to energy communication, we do not advocate that this line of research be eradicated. Rather, we suggest an expansion beyond the crisis frame that can retain its value while also bringing in new communicative resources to engage with everyday aspects of energy. This expanded framework for energy communication research would emphasize the importance of *context* over crisis and reaction. As communication scholars have known for decades, context matters. Energy communication scholars should never ignore the social, political, and cultural contexts of energy production and consumption decisions. Yet, both particular crisis events and the chronic climate crisis are only two possible contexts for energy communication research. Moving from a crisis-responsive to context-oriented position allows for continued research

on crises while also encouraging examination of broader societal structures that impact energy production. Further, within the context of climate change, energy communication should strive towards creative composition. Latour (2010) asserts that the insights of social science research risk irrelevance if they stop at critique and fail to explicitly account for power imbalances. In line with what Sismondo (2008) calls the engaged program of science and technology studies research, there is an urgent need to use the insights of energy communication scholarship to inform policy choices related to phenomena that demand immediate attention, such as energy policy in relation to climate change. In an attempt to respond to the need for immediate, yet thoughtful, policy action, Latour (2010) proposes the metaphor of *composition*, which "acknowledges that things have to be put together (Latin-*componere*) while retaining their heterogeneity" (pp. 473–474). This metaphor enables a way of thinking about energy communication research that is not just responsive, but also proactive in terms of composing untapped opportunities for developing energy policy.

More emphasis on context and composition in future energy communication research can enhance communication theory, contribute to interdisciplinary studies of energy, and provoke practical and applied research about and for just energy futures. Energy communication research already contributes to communication theory across a variety of subareas of the field. In the sources cited throughout this chapter, we have seen contributions to organizational communication, risk communication, rhetoric, media studies, and more. Under the crisis frame, we have seen numerous theoretical resources from communication brought to bear on particular crises. By thinking more broadly about the contexts of energy communication and more specifically about the everyday practices of energy, we might open up new theoretical streams in energy communication research.

Further, energy communication research is poised to contribute to interdisciplinary studies of energy that often miss out on the importance of communication. For instance, research that draws from rhetoric (Bedsworth, Lowenthal, & Kastenberg, 2004) and framing (Pralle & Boscarino, 2011) can point to the importance of communication in energy policy and decision-making, highlighting the essential role of communication in such deliberations. Controversies over future energy policies, choices, and technologies all have communicative elements. Communication is primed to extend emergent themes into further research trajectories regarding energy resource development.

Finally, a context-oriented emphasis allows for the development of applied research that seeks to make a difference in both crisis-oriented energy communication and energy in everyday life. Of course, current research in energy communication already has significant applications in ongoing energy crisis events. Expanding on the crisis frame that currently guides much research in energy communication enhances the possibilities for application and composition with meaningful consequences for society. Given the importance of energy resources, production, and consumption to policy, there continues to be a need to engage in what Endres, Sprain, and Peterson (2008) describe as praxis-based

research. A proactive context orientation might enable energy communication researchers to develop heuristics that strengthen the communication discipline and are socially pragmatic even in times of non-crisis, times we hope will become more common in our energy futures.

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