

Morals, Materials, and Technoscience: The Energy Security Imaginary in the United States

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Abstract

This article advances recent scholarship on energy security by arguing that the concept is best understood as a sociotechnical imaginary, a collective vision for a “good society” realized through technoscientific-oriented policies. Focusing on the 1952 *Resources for Freedom* report, the authors trace the genealogy of energy security, elucidating how it establishes a morality of efficiency that orients policy action under the guise of security towards the liberalizing of markets in resource states and a robust program of energy research and development in the United States. This evidence challenges the pervasive historical anchoring of the concept in the 1970s and illustrates the importance of the genealogical approach for the emerging literature on energy and sociotechnical imaginaries. Exploring the genealogy of energy security also unpacks key social, political, and economic undercurrents that disrupt the seeming universality of the language of energy, leading the authors to question whether energy security discourse is appropriate for guiding policy action during ongoing global energy transitions.

Introduction

In 1961, Frank M. Porter, head of the American Petroleum Institute, the largest American oil and gas industry group, was testifying before a House committee on the matter of how growing petroleum imports, specifically from the burgeoning fields of the Middle East, were detrimental to American small business. Discussing the ever-growing problem of new reserve discovery, Porter argued, “[It] is an equally inescapable fact that the foundation of our future *energy security* is based upon the success of continuing exploration, a highly speculative venture” (Small Business Problems Created By Petroleum Imports 1961, 143, emphasis added). Porter’s 1961 testimony stands as one of the earliest uses of “energy security” in American policy discourse. His use of the term challenges conventional wisdom on energy policy in the United States – in particular that “energy security” as part of American policy lexicon does not appear until the early 1970s (Smernoff 1973). One can see Porter’s appeals to continuing technological advancement in energy production methods echoed today in the energy policy discourse of the Obama administration (Office of the Press Secretary 2013):

America’s scientists are a national treasure. Every day, idea by idea, innovation by innovation, they are developing new technology that will help secure our energy future. If we want to keep moving forward, we need scientists to keep inventing and innovating, to keep unlocking new solutions and pushing new breakthroughs. . . . The Energy Security Trust will invest in research that will make future technologies cheaper and better – it will fund the advances that will allow us to run cars and trucks on electricity or homegrown fuels, and on the technology that will enable us to drive from coast-to-coast without a drop of oil.

Focusing on the Paley Commission's *Resources for Freedom* report from 1952, we explore the fundamental values and assumptions underpinning energy security as they appear in the early 1950s. Though largely overlooked in later analyses (e.g., Mitchell 2011; Vietor 1984), the Paley Commission's ideas were, in the words of Senator George Malone, "[to be] regarded as an authoritative text and guide to United States mineral policy" (United States Senate 1954, 2).

Tracing the genealogy of "energy security," and in particular how it organizes the relationship between the state, natural resources, energy technoscience, and markets, leads us to argue that energy security is best understood as what Jasanoff and Kim (2009) call a "sociotechnical imaginary," a form of social understanding embedded in policy action that elucidates how certain forms of technoscience and political order are co-produced (124). As a sociotechnical imaginary, energy security orients policy action by enrolling a well-ordered "moral" resource-efficient society within the overarching paradigm of unfettered economic growth as supplied through the state-aided advancement of energy technoscience. These moral and material issues are understood to be the underpinnings of U.S. national security and the "freedom" of the world. Concern for the environment and the local and regional scales of energy security do not factor into these discourses; debates between various actors instead focus on federal policies supporting research and development and establishing efficient flows of raw materials from states where they are produced (either internal or external to the state) to where they are needed for efficient consumption.

Approaching energy security as a sociotechnical imaginary advances research in the energy policy, resource economics, and geopolitics literatures that seek to establish "definitional clarity" (Chester 2010, 893) in the process of theorizing what constitutes energy security. Focusing at a multitude of societal scales – community/regional, national, and global. These scholars (e.g., Chester 2010; Hughes 2009; Luft and Korin 2009; Sovacool and Mukherjee 2011; Sovacool et al. 2011; Sovacool 2011) argue that a variety of different factors such as cost of energy, physical security of pipelines and sea faring transport, distribution of ecological burdens from energy production, and overall access to energy can or should determine energy security. This paper continues the process of clarification, and through examining the historical context of energy security in the United States, establishes the specific sociotechnical linkages that underlie the relationship between "energy" and "security." Furthermore, this paper seeks to emphasize the value of sociotechnical imaginaries as a process of challenging the basis for key concepts in policy discourse. Such an emphasis is doubly important for energy research, as the very ontological uncer-

tainty of energy lends itself to discourses that reify the importance of energy consumption to human civilization (for examples, see Basalla 1980; Hornborg 2013).

Our paper begins by outlining current research on energy security, highlighting major themes and recent scholarship focusing on the epistemological nature of energy security. We next briefly outline sociotechnical imaginaries to provide a basis for considering energy security as one, emphasizing the importance of an imaginary's genealogy to understanding and thus challenging the histories that pervade energy security discourse (e.g., Yergin, 2011). We then proceed to analyze the Paley Commission's report, emphasizing the importance of efficiency, morality, and security throughout the document and the influence of these concepts on energy policy discourse into the 1970s. Finally, we outline the advantages of considering energy security as a sociotechnical imaginary and propose pathways for further research. Viewing energy security as a sociotechnical imaginary with a particular history illuminates key features of the concept that go largely unspoken in current debates. Energy security is, at its core, a strategy for linking research on energy-producing resources (oil, coal, uranium) and the basic science underlying each of these productive enterprises to the places of (implicitly domestic) resource consumption and, critically, to a "moral" sensibility of resource economics built on liberal economic principles. Such an underlying sensibility of what policy action is necessary presents serious questions in relation to sustainable development in resource-rich communities and the challenges posed by climate change. In concluding, we strongly question the value of continuing to theorize about energy security as though it is a necessary and attainable material aspect of our world.

Conceptualizing Energy Security

In paradoxical and often contradictory ways, since 2001, the boom in energy social science research has created a large body of work that addresses energy security. Most of this work attends to energy security as a static concept, invoking the term to justify certain policy actions or decision-making tools (e.g., Dhaka 2009; Ferguson 2009; Kumar Singh 2013; Margonelli 2009). Others, most notably Daniel Yergin, criticize the use of the concept itself as embedded in nationalistic resource grabs that attend more to "energy independence" than "security" in a liberal economic sense of global interdependence and mutual growth (Mallaby 2006; Noël 2008; Yergin 2007, 2006a, 2006b). A second set of critiques comes from the geopolitics realm of inquiry, and examines the role of state exercises of power, namely military action, in the securing of natural resources (namely oil). These authors (e.g., Klare 2007;

Toft, Duero, and Bieliauskas 2010) analyze the use of military force by the United States to exercise physical security – that is the control of pipelines, refineries, and shipping channels – across the globe. While these scholars also treat energy security as a static concept, they focus on questions of power rather than consumptive economies. Finally, a small group of scholars rejects energy security outright as being too “vague” (Lomborg 2011) to initiate meaningful policy action on climate change in a world of increasing energy consumption.

More recently, scholars have begun to examine the question of energy security from an epistemological perspective, collecting both qualitative and quantitative data to compile, criticize, and refine factors that pertain to energy security and its situatedness in society writ large. These critiques (Ciută 2010; Cherp 2012; Cherp and Jewell 2011; Chester 2010; Littlefield 2013; Toke and Vezirgiannidou 2013; Valentine 2011) note the “polysemic” nature of energy security across policy research, and analyze the epistemological methods used to determine what is and is not relevant to being “energy secure.” In combination, the authors highlight a number of key factors. First, energy security is not a “security” matter in the sense that it is bounded by an academic “domain of meaning and practice” (Ciută 2010, p. 124) readily differentiated from other geopolitical issues. The only way in which energy security does fit this space is that it is primarily a nation-state situated discourse (Ciută 2010; Littlefield 2013; Toke and Vezirgiannidou 2013) which draws from security discourse embedded in conceptualizations of hegemony through technoscience (Falkner 2005; Jelly-Schapiro 2013; Masco 2010). Second, energy security research currently focuses on examining the concept via quantitative or qualitative methodologies that start from the initial assumption that energy security is something nation-states (or the world) can and should achieve. Finally, Toke and Vezirgiannidou (2013) note that through inductive analysis scholars can observe that action on climate change is incongruous with current energy security discourse.

This final point is important, for it highlights the possibility that “energy security” is in some way embedded in a dialogue that is incongruous with policy discourses that recognize the “climate” as a site for policy action. Other scholars, notably Cox and Béland (2013), argue that through the framing of “sustainability” energy security can serve to build unlikely coalitions (such as between wind supporters and oil tycoon T. Boone Pickens) and enact policy change in support of alternate systems of energy production and consumption, but they fail to clearly define “energy security” nor explain the underlying political-economic consequences of sustainability to energy security discourse. Like Cox and Béland, Toke and Vezirgiannidou’s analysis touches on the question of climate discourse and energy security, but does not meaningfully ask (1) why “energy security” exists as a subject of debate in poli-

cymaking, and (2) where this interest comes from. Reorienting discussions surrounding energy security away from analyses concerned with definitions based on current research and policy discourse towards the examination of how energy technoscience, the state, and society writ large were discursively organized, such as is possible through treating energy security as a sociotechnical imaginary, provides an opportunity to reexamine the landscape of current energy policy discourse.

Energy Security as Sociotechnical Imaginary

As “collectively imagined forms of social life and social order reflected in the design and fulfillment of nation-specific and/or technological projects” (Jasanoff and Kim 2009, 120), sociotechnical imaginaries provide lenses for understanding, valuing, and attempting to bring about a “good society” through particular technoscientific projects. Sociotechnical imaginaries are less explicit, issue-specific, goal-directed, politically accountable and instrumental than policy agendas, as they “reside in the reservoir of norms and discourses, metaphors and cultural meanings out of which actors build their policy preferences” (ibid, 123). Like narratives and discourses, they guide interpretation and frame the boundaries of the thinkable, but sociotechnical imaginaries are always and more specifically associated with “active exercises of state power” (ibid, 123), such as through the selection of policy priorities, fund allocation, and infrastructure investment.

Sociotechnical imaginaries induce the active exercise of state power, which means that they are situated within a particular discursive regime that co-produces perceptions of a good society and the forms of knowledge that organize it. Research demonstrates the influence of sociotechnical imaginaries over energy policy, including the concepts of growth and containment in nuclear energy (Jasanoff and Kim 2009, 2013) and localized bioenergy substitutions of non-mineral energy sources for oil imports (Eaton, Gasteyer, and Busch 2013; Levidow and Papaioannou 2013). Other studies use the framework of sociotechnical imaginaries to investigate the linking of national and regional identity with particular energy sources, most prominently in oil and gas (Bouzarovski and Bassin 2011; Ruijven et al. 2013), with attention to the usefulness of the imaginaries concept for translating between local, regional and national scales (Eaton, Gasteyer, and Busch 2013; Teschner and Paavola 2013). The scale of these political spaces varies from NGOs and scientific advisory boards to corporations and entire states (Program on Science Technology & Society 2012). The question of scale draws attention to the possibility of multiple and competing

sociotechnical imaginaries being simultaneously at play in any one context, as actors can hold “different visions and goals” (Eaton, Gasteyer, and Busch 2013, 2; see also Jasanoff and Kim 2009, 123; Levidow and Papaioannou 2013).

In addition to spatial situatedness, sociotechnical imaginaries invoke a temporal dimension by providing specific, policy intervention oriented visions of the future. These imaginaries invoke what the world *is* and what the world *should be*, as they are “imbued with implicit understandings of what is good or desirable in the social world writ large” (Jasanoff and Kim 2009, 122; see also Eaton, Gasteyer, and Busch 2013, 4). Though the forward-looking orientation dominates Jasanoff and Kim’s (2009) original conception of sociotechnical imaginaries as well as much of the research it inspired, Eaton, Gasteyer, and Busch (2013) point to significance of the past, as “definitions and contestations are related not only to imagined futures but to different interpretations of environmental histories” (3). Varying interpretations of the past shape the visions for the future encoded in imaginaries.

Sociotechnical imaginaries are profoundly *real* in the sense that they underlie the exercises of power and policymaking through which actors produce concrete effects in the world (Eaton, Gasteyer, and Busch 2013, 6; Fairclough 2010, 480; Levidow and Papaioannou 2013, 38; Teschner and Paavola 2013; Tsing 2000). As such, they mediate the “understudied regions between imagination and action, between discourse and decision, and between inchoate public opinion and instrumental state policy” (Jasanoff and Kim 2009, 123). Imaginaries are thus performative in the sense that they enact the world they describe, though this enactment is complicated by the messy sociotechnical discourses and systems with which they articulate (Weszkalnys 2011).

This article builds on the emerging sociotechnical imaginaries literature by highlighting the importance of tracing the genealogies (Foucault 1984, 2008) of said imaginaries. With the exception of Jasanoff and Kim’s study of nuclear energy imaginaries in the United States and South Korea, few scholars have traced the genealogy of their imaginary within the greater context of the sociotechnical system they seek to critique. The transactions between the state, knowledge production systems, and everyday lived experience that produce stable discourses around the characteristics of an “energy secure” state are a fundamental part of understanding what types of societies are possible within this paradigm; ignoring them leaves the fundamental assumptions that underlie the ontological consequences of these imaginaries in political order unchallenged. Levidow’s study of biofuels policy in the EU during the 1990s provides an example of this. Focusing on the transnational level as opposed to the histories of individual EU-member states obfuscates how state-level biofuels policies, such as the transition from ethanol to petroleum-based vehicle fuels during the 20th century in France (Carolan 2009) influence how actors decide to link technoscientific

projects and political order. While we acknowledge the necessity of such constraints within publication, we argue that in the case of energy security, a concept we have already shown appears over 50 years ago, questioning the “naturalness” of energy security as an organizing principle for policy making is crucial for mapping out how this sensibility of social order maps people, resources, and states. We argue that the 1952 Paley Commission report serves as a valuable site to begin exploring the three elements brought together within energy security discourse – energy-centric technoscience and resources, “security” for the state as a product of resource extraction, and the “moral” underpinnings of a globalized energy market.¹

Energy Technoscience and Liberalism as “Foundations for Growth and Security”

“The United States, once criticized as the creator of a crassly materialistic order of things, is today throwing its might into the task of keeping alive the spirit of Man... In defeating this barbarian violence, *moral values will count most, but an ample materials base must support them.*” (The President's Materials Policy Commission 1952d, 1, emphasis added)

“Indeed the strongest and most versatile single resource in the fight against scarcities of materials is technology.” (The President's Materials Policy Commission 1952a, 132)

In a 1951 letter to CBS Chairman William Paley, President Truman outlined a presidential committee to “make an objective inquiry into all major aspects of the problems of assuring an adequate supply of production materials for our long-range needs” (Truman 1951). Consisting of five volumes and covering questions of both domestic and foreign resources (bounded within the context of the “free world”), the Paley Commission’s *Resources for Freedom* report would “put to rest” (Mitchell 2011, 177n10) domestic concerns over material resources. In this section, we overview the context in which the Paley Commission’s (‘the Commission’ hereon) report emerges to situate our argument for how energy security functions as a sociotechnical imaginary and what particular technologies of governance were imagined as appropriate to make this vision possible. The 1950s represent a pivotal moment in the history of American policy discourse where both “materiality” as the historicized pattern of mounting American natural resource consumption and “materialism” as a “barbarian” (and implicitly Communistic) political-economic philosophy are opposed to the “security” of the state. American overconsumption is viewed as a failure of cultural values – values which require the scientific rationalization of consumptive behaviors to correct. Rational manage-

ment of consumption, however, does not explicitly provide any space for the role of the “market” as a site of truth-making within society. Furthermore, a purely scientifically managed society is the exact type of “barbarian” political-economic suite of policy actions the Commission directly opposes. In this light, the key question the Commission must contend with is this: how does the state link new forms of sociality around energy resources, the necessity of “natural” activity within liberal economic society markets, and “national security”?

Expanding on Eli Jelly-Schapiro’s (2013) genealogy of “security” in western society, we contend that the process of creating a notion within policy discourse of “energy security” requires discursively constructing a space for market intervention, asserting the role of state-funded “energy technoscience” within this process of marketization, *and* articulating particular notions of what a good American society must behave like as the social fabric which will maintain this arrangement of disparate elements.² Energy, as opposed to particular natural resources such as oil, coal, natural gas, etc., is this site of intervention. Securitizing particular resources, such as oil, was a technique of governance prior to the 1950s; the management of domestic resources, the production of geographies of oil production in relation to the shoring up of military power (Shulman 2003), and imagined military action stemming from the loss of particular resources (“Past, Present and Future of the Oil War” 1927) assume state intervention at the sites of individual resource production and consumption. Intervening on “energy,” however, received only cursory attention prior to the Second World War (Energy Resources Committee 1939). The distinction between a particular resource and “energy” as a site of securitization is important – energy does not exist in the material world insofar as one cannot “bottle up” pure energy. It lacks a clear ontological basis (Mitcham and Rolston 2013) and as a consequence one must produce a site for energy to intervene within a sociotechnical system if the concept is to have any practical meaning.³ To create a site for the intervention of energy, one first needs to create a sensibility of a particular kind of technoscience devoted to the study and production of energy. Energy technoscience, as a realm of state intervention, draws on the linkages between science, technology, and society established through the Manhattan Project experience and articulated by Vannevar Bush in *Science: The Endless Frontier*. Energy security, by the very emphasis on the “interdependence of moral and material values” (The President’s Materials Policy Commission 1952d, 1), establishes certain expectations for what a good society should look like, the explicit role of energy technoscience in such a society, and the importance of well-directed social policies to bring it into existence.

“Lavish” Versus “Efficient” Energy Societies

Summarizing the state of materials policy, the Commission notes Americans “think about raw materials last, not first” (The President's Materials Policy Commission 1952a, 2) when considering questions of productivity and economic growth. History, from the Commission’s perspective, lends itself to this narrative, with all persons from the first Euroamerican settlers to the present day citizenry misinformed that the United States was and is capable of supplying all of its raw material needs. Efficiency and interconnectivity of resource systems were the proposed solutions to this misguided culture of “lavish” waste (ibid, 23):

As prudent householders our first necessity is to use the remaining resources with the highest efficiency we can achieve, but only as fully as is permitted by the principle of buying materials at the least cost consistent with assuring supplies required by the national security.

Three elements stand out in this statement, each of which we will address in turn: the individual within society (as the atomized “householder”), efficiency as a product of resources and technoscience, and material national security. First, consumption of materials and, as a consequence energy technoscience, is a matter for society as a whole. Morality, as mentioned above, is a fundamental part of the fight against the “crassly materialistic order of things” – it is the duty of each individual to overcome the materialisms (consumptive and Communistic) mentioned earlier. Where, however, is this morality rooted? As described by liberal economist Wilhelm Röpke, each individual within society must exhibit these morals, lest the market and the state fall prey to materialistic influences (1998 [1968], 125):

Self-discipline, a sense of justice, honesty, fairness, chivalry, moderation, public spirit, respect for human dignity, firm ethical norms – all of these are things which people must possess before they go to market and compete with each other. These are the indispensable supports which preserve both market and competition from degeneration.

Efficiency is, by definition, a form of self-discipline – one that emphasizes the rationalization of material consumptive practices and aims towards a linear relationship between consumption and productivity.⁴

Noting that the rapid growth of productivity in terms of total economic output occurred at over three times the rate of population growth, however, the Commission argues that “the combination of increased energy and im-

proved technology today provides the main promise of further economic growth within the physical limitations of natural resources” (ibid, 103). Contemporary resources (i.e., fossil fuels) solve immediate needs, but the finite nature of these resources meant that innovation held the keys to “civilization’s energy needs” (ibid, 106). This process of innovation has, by and large, occurred outside of the purview of state policy; however, for technology to continue “dwarf[ing] all the previous accomplishments” of the 20th century (The President's Materials Policy Commission 1952d, 51), especially in relation to the material constraints on energy resources, the state must uptake the morality of energy technoscience innovation through policy action.

To this end, the Commission advocates for a comprehensive energy policy, one that supports “awareness on the part of all those dealing with energy policy of the close relationship of energy to the broader problems of materials, economic growth, and national security” (The President's Materials Policy Commission 1952a, 129). Drawing from Vannevar Bush’s emphasis on science as fundamental to “our health, prosperity, and security as a nation” (Bush 1945), the Commission argues that “an intensive program of basic scientific research and technical development be undertaken on techniques and instruments of exploration for minerals” (The President's Materials Policy Commission 1952a, 29) to tame the “headless” (ibid, 144) force of uncoordinated research initiatives across multiple agencies and, to a lesser extent, outside of government. Continuing the theme of linking individual material behaviors, energy technoscience, and state policy to the question of creating a moral and efficient energy technoscience-based economy, the Commission emphasizes the role policy must play in overcoming material deficiencies (ibid, 18):

Most Americans have been nurtured on the romantic notion that technology will always come to the rescue with a new miracle whenever the need arises... But isolated solutions of problems relating to individual materials are no substitute for the broad frontal attack which technology needs to make on the materials problem as a whole.

A moral energy economy, within the context of the United States alone, depends on both overcoming a naïve sensibility about the “natural” abundance of resources consumed for energy and enrolling the necessary disparate elements of society via policy action into a visible system of production and consumption. There is, according to the Commission, nothing natural about the United States’ material consumption practices – they are a product of a materialistic culture that has so far prospered without consideration of these facts. Energy technoscience and the pursuit of technological innovation, unacknowledged until now, has made this possible. A new economy of energy must

depend on both the rational individual consumption of energy producing resources and a necessary (but limited) intervention on the part of the state to support energy technoscientific research. By focusing policy actions on activities related to the development of new knowledge pertaining to the production and consumption of energy, and the physical production of objects of energy technoscience (on a limited scale), the state will facilitate the necessary conditions for new, efficient, “moral,” realms of social behavior and market activity.

Energy, Liberalism, and Global Security

A morally efficient, market-based society, however, is not necessarily a secure one. What the Commission has to say explicitly about “national security” pertains to questions of wartime mobilization and reserves capacity. In relation to energy policy, this is easiest to observe in what the Commission has to say about oil and national security. Following along the lines of “oil security” as conceptualized throughout the early 20th century (e.g., Sheldon 1948), security pertains directly to questions of supply lines, modes of transportation, and nation-state actors. However, while these issues are ostensibly nationally-oriented with an eye towards production during wartime, the Commission notes that “the problem of wartime supply and consumption for which preparation must be made is, therefore, a single comprehensive pattern for the entire free world” (The President's Materials Policy Commission 1952b, 10). National security (or what we can now call security more generally) in this sense is much like the question of energy efficiency; morally situated and embedded in the rhetoric of the Cold War.

Understanding how the relationship between morality, security, and efficiency works in relation to energy technoscience means stepping back for a moment to take in a larger perspective on the nature of the Cold War as it pertains to economic growth and industry. Sovietologist and economist Peter Wiles, in a piece contemporary to the Commission’s report, notes the centrality of economic competition as “the most important thing, for in the end the country that grows most becomes biggest, and every economic advantage belongs to it” (1953, 566). It follows that the Commission’s analysis should also focus on facilitating the “efficient flow of energy supplies between surplus and deficit areas in order to contribute to general economic growth and to bolster the security of all nations” (The President's Materials Policy Commission 1952a, 122). Emphasizing the centrality of morals and materials to defeating Communism (The President's Materials Policy Commission 1952d, 1), the task of global security as it pertains to materials becomes a question of liberalizing global markets, removing trade barriers, and facilitating an efficient

flow of resources from producer to consumer states. This is doubly so for energy materials, where the complexity of global networks for resources, and in particular oil, posed one of the “gravest problems” (The President's Materials Policy Commission 1952b, 10) in terms of wartime security during the Second World War for the United States and its allies in western Europe. Within this network of liberalized trade, the Commission notes, “the United States is in a particularly effective position to lead in the removal of barriers and to stimulate the flow of raw materials” (The President's Materials Policy Commission 1952a, 77).

The case of Venezuela in the report is indicative of the spoke-hub model employed by the Commission in its appreciation of the role of energy producer states. Openly rejecting the desire of producer states to opt for economic diversification, the Commission regards natural (energy) resource production (via American energy technological innovations) as an acceptable modality for development, since “[w]idening the use of modern technology and skills in materials production and processing provides technical training and experience essential to progress in other areas of the economy” (The President's Materials Policy Commission 1952a, 73). In the Commission’s assessment, the overarching conclusion that “the security interests of the free world requires expansion of materials output” (ibid, 62), means the primary role of U.S. foreign policy is to improve business opportunities in these states through liberalization of trade policy and the facilitation of capital and technical expertise to develop the economy of the producer state. Producer states that facilitate the transfer of raw materials to consumers (i.e., the United States) will see the benefits of imported technologies and bolster global security (The President's Materials Policy Commission 1952c, 99, emphasis added):

By developing her [Venezuela’s] rich material resources, mainly with the aid of private investment capital and technical know-how supplied by the United States, Venezuela has achieved in a short span of years an almost unparalleled record of economic and social advancement... Not only have rising Venezuelan materials exports stimulated world trade, but *the security of all free nations* has been increased by Venezuela’s immense and growing capacity to produce oil—an essential for peaceful production and defense.

As such, energy (via oil) production, facilitated by the United States through capital and energy technoscience transfer, increases the overall “security” of the free world by ensuring that the necessary raw materials for peacetime *and* wartime production and defense reach where they are needed in the developed “free” world. This is not simply a question of economics, but of morals, as the “materialistic” threat of Communism demands that both the United

States and the rest of the “free world” maintain economic growth and development. Economic growth, via efficient flows of resources and capital, supplemented by American government funded energy technoscience at home and abroad, are the moral and material underpinnings on which global security and “freedom” depend both now and into the future.

After Resources for Freedom

The *Resources for Freedom* report functioned as a site of policy discourse in government, academia, and the wider public from its publication in 1952 through the mid-1970s. Resources for the Future (RFF), a think tank Paley would establish the next year, carried the conversations initiated by the Commission into the Eisenhower Administration (The Washington Post 1953), continuing to emphasize the necessity of a system of energy policymaking rooted in energy technoscience research, liberalized markets, and a morally “efficient” society (Resources for the Future 1954, 251):

So as we progress, our energy needs increase by leaps and bounds. Everything about our industrial civilization tends to higher and higher consumption of energy. All we can do in the way of conservation is to see that energy is used as efficiently as can be to accomplish the results that we are after.

Though many respected energy scientists and business leaders were present during the inaugural RFF conference in 1953, many of the New Deal era cooperative utilities organizations elected to boycott the proceedings, accusing the organizers of stacking the meeting with anti-public/anti-cooperative private corporations (Graves 1953). This shift away from New Deal politics, in particular centralized planning of infrastructure, suggests one of the essential tensions arising from the Commission’s report. With the rise of neoliberal economic theory in the United States, and the erosion of planned economies in western Europe over the next twenty years, the extent of the state’s role in facilitating what we can now call nascent “energy security” is problematic at best. As an imaginary, the policymaking power of energy security is in the emphasis on adjusting energy consumption through technoscience. Placing the onus on government to facilitate basic research and social policy towards the efficient use of energy today and new technologies tomorrow leaves the government’s role in market regulation a matter open to interpretation.

Consequently, while the Commission's report waned in terms of dictating specific energy policies during the late 1950s (Vieter 1984), it did facilitate a space for dialogue concerning the importance of energy technoscience to "contribute to economic progress and national security for the foreseeable future" (Energy Resources and Technology 1959, 150). Similarly, contemporary coal advocates refer directly to "Energy and National Security" (ibid, 240) writ large (as opposed to particular resources) and the centrality of "energy security" in global economic competition (ibid, p. 242, emphasis added):

Now [during this hearing] we're discussing the immediate problem of our energy resources and how they can help America surmount the Soviet challenge. For the basic necessity for *winning* an emonomic[sic] race is a greatly expanded output of energy fuels, the very heart of industrial production.

Winning here, much like the Obama Administration's claim of using energy security as a justification to "build a 21st century clean energy economy and *win the future*" (Office of the Press Secretary 2011, emphasis added) puts the emphasis on competition. Porter's 1961 statement concerning energy security mirrors this; energy security is a product of a system of policies that support energy technoscience towards resource production while facilitating a competitive market that supports enterprise (such as through the many small producers Porter represented). Richard Nixon would some ten years later reiterate these points, calling for another study of the United States' energy resources position and policy (Nixon 1971):

For most of our history, a plentiful supply of energy is something the American people have taken very much for granted. In the past twenty years alone, we have been able to double our consumption of energy without exhausting the supply. But the assumption that sufficient energy will always be readily available has been brought sharply into question within the last year...

A sufficient supply of clean energy is essential if we are to sustain healthy economic growth and improve the quality of our national life. I am therefore announcing today a broad range of actions to ensure an adequate supply of clean energy for the years ahead. Private industry, of course, will still play the major role in providing our energy, but government can do a great deal to help in meeting this challenge.

One can observe the same general themes outlined here as were brought up in the Paley Commission report – Americans’ consumptive materialism is rooted in a false “history” of plenty. Energy consumption patterns are a product of innovation and economic growth – facilitating a continuation of this pattern of consumption means government must play a part in supporting economic growth by fostering the necessary social policies, especially around energy technoscience research, which will provide the market the tools to continue to meet consumer demand. If morality is missing from Nixon’s speech, it is because it has become internalized within the conception of the energy technoscientific research itself – the very rationalization of consumptive behavior through technological means and marketization. The attempted realization of this moral vision through policymaking places energy security squarely in the realm of a sociotechnical imaginary.

Conclusion: Implications of Energy Security as a Sociotechnical Imaginary

Based on our analysis of the Paley Commission’s report, we argue that the energy security imaginary is, as noted by Maass (1953, 208) “a highly nationalistic drama”, whereby energy policy action that facilitates global free markets and energy technoscience performs the doctrine of national security. The energy security imaginary posits economic growth-achieved through the government’s facilitation of markets for private industry and sponsorship of research and development-as the primary mode of “security” against Communist, Middle Eastern, and other “non-free world” actors.

Our research fundamentally questions the ontological basis of energy security as it is conventionally used by shifting the conversation to attend to the language and moral visions that underlie policy action. Tracing the genealogy of an imaginary is a crucial but overlooked element in recent scholarship analyzing sociotechnical imaginaries. Genealogies elucidate the complex and conflicting labyrinth by which ways of knowing about the world and human nature become policy action. Though operating at many levels and in a multitude of contexts, sociotechnical imaginaries do not simply drive state exercises of power but produce order in the world. Containment and energy security, both critical imaginaries for understanding the global technoscientific order surrounding energy in the 21st century, persist because they are embedded not only in policies, but also in how the social body of experts and policymakers enmeshed in these sociotechnical systems construct the world. Thus, analyzing sociotechnical imaginaries should go beyond exposure to consciously recognize the emergence of such ways of knowing and challenge the po-

litical order(s) they produce. Genealogical analyses, such as we have provided in the case of energy security, illuminate tenacious formations of state-market-technoscience networks, as Obama's statement on the Energy Security Trust in the introduction makes clear.

Nowhere is this more important than in the case of energy policy discourse, as the ontological "mystery" (Mitcham and Rolston 2013) of energy lends itself to a "moral" economy at the base of neoliberal economic policies. In attending to energy security through the evaluation of various factors relating to the state of being "energy secure", scholars have (whether intending to or not) facilitated the ontological grounding of energy security by ascribing theoretical heft to the concept. Approaching energy security and other energy-related policy terminology (energy justice, energy ethics, sustainable energy, renewable energy, and the like) through an emphasis on the genealogies of these "imaginaries" would emphasize the social, political, and cultural contexts of energy policy discourses. All too often "energy" is taken at face value, as a term that emphasizes the same physical science meanings regardless of context. As such, our emphasis is not on categorization, but disruption of the boundaries between "energy security" policy problems and the larger questions of market construction and state-funded technoscience. Such an approach to the current debates in energy security scholarship challenges efforts to "imagine" consensus on the governance of global environmental problems and problematizes international cooperation on energy resource management.

Tracing the genealogy of energy security also raises implications for grappling with energy security in relation to current questions of social justice. First, if we take two key components of the establishment of climate and environmental issues within the national consciousness – Rachel Carson's 1962 *Silent Spring* and the 1965 Presidential Science Advisory Committee report on climate change – as markers of the introduction of global environmental issues, we must confront the possibility that "the environment" as an object in energy policy has no bearing on being "energy secure". Despite Nixon's protestations for environmentally friendly energy in 1971, the consensus was that energy security is national security through energy market means. Nixon seems to have had little will to enforce the former point, as after the 1973 OPEC oil embargo it disappears from his "Project Independence" energy policy campaign (Nixon 1973). Likewise, we can also agree with Toke and Vezirgiannidou's (2013) assessment and say there is little space in the energy security imaginary for sustainability decoupled from liberal economies.

Second, energy security privileges national scales and state-level actors, making it difficult to attend to local dimensions of energy security and regional geographical differences in the energy mix. Contemporaries of *Re-*

sources for Freedom also noted the “Commission’s failure to consider problems of materials production and use in their regional setting” (Ackerman 1953, 174). For the Commission, integration of energy and material systems across the country would deal with the problems of energy access. This approach also obscures salient issues pertaining to the equity of community development around and through energy resources and procedural and distributive justice as it applies to knowledge about energy systems.

In our constructive criticism, we hope to facilitate the conversations Valentine (2011) sees as valuable to further articulating energy security. Future research along the path of energy security as a sociotechnical imaginary should take the lead established by Jasanoff and Kim and expand our approach to the nascent energy security conversations in other parts of the world, paying attention to the similarities and differences between American discourse and those in other places that are animated by different visions of a good and “secure” society. Other projects should seek to further explore how these large-scale imaginaries work at the regional/community level, as Eaton, Gasteyer, and Busch (2013) have begun for bioenergy in Michigan. Understanding the interface between sociotechnical imaginaries and lived experience will provide valuable insights into how these imaginaries shape social order.

As a sociotechnical imaginary, energy security has influenced the exercising of vast amounts of state power and capital towards global resource integration and energy technology development. Furthermore it is rooted in a particular, western, sensibility of the moral behaviors of individuals and states – sensibilities that are by no means universal. Stepping back to observe the genealogy of energy security forces us to ask the question; do we have the right imaginary to “imagine” an energy equitable world?

Notes

1. In this way, our analysis parallels the work of Mitchell (2011) by focusing on the intersection of national security, “the economy” as a concept in liberal economics, and energy resources. This project goes further, however, in analyzing “energy security” rather than “energy crisis.” Though we acknowledge these as intertwined concepts, we argue that understanding the emergence of energy as an object of state intervention as it is coproduced through the techniques of “economicality” (Mitchell 2014) that are emerging at roughly the same time (1948 – 1953), requires attending to the object of energy security as used in policy discourse. Energy crisis may create a space for state intervention, but energy security is the imagined form of a suite of policy actions geared towards addressing the linkages between energy and society, both in the present and into the future.
2. We use the term “energy technoscience” here to designate a how the Commission constructs a cogent body of research and development focused on the rational and efficient exploitation of natural resources towards the production of energy, either in the form of transportation (cars, ships, non-electric trains), heat, or electricity. Case in point: the structure of the volume *Resources for Freedom* devoted to “energy sources” addresses the energy found in oil, gas, coal, and electricity. Here, resources and technologies alike are subsumed, at least discursively, to the larger category of “energy” which, as the report notes, is the locus of state intervention.
3. Energy has in many ways always carried a polymorphous set of meanings. As noted by Crosbie Smith in *The Science of Energy*, early energy technoscience was eminently concerned with the rationalization of all elements of Scottish life. Later political economists of natural resources, such as Stanley Jevons, would acknowledge the “vast store of energy” (1866) within

various combustible natural resources, but they would continue to focus on particular resources as the site of state and market intervention.

4. These are analogous to “technologies of subjectivity” and “self-government” as opposed to “technologies of subjection” that Aihwa Ong (2006; also see Rolston 2010) discusses in relation to the organization of economies and states in Southeast and East Asia. The comparison between contemporary zones of economic development there and the state of American resource economics at the end of the Second World War is appropriate, given that these forms of managing populations towards the formation of economies are just emerging in the natural resource (soon to be energy) sector.

References

- Ackerman, Edward A. 1953. "Resources for Freedom." *Annals of the American Academy of Political and Social Science* no. 288:172-175.
- Bouzarovski, Stefan, and Mark Bassin. 2011. "Energy and Identity: Imagining Russia as a Hydrocarbon Superpower." *Annals of the Association of American Geographers* no. 101 (4):783-794.
- Basalla, George. 1980. "Energy and Civilization." In *Science, Technology, and the Human Prospect: Proceedings of the Edison Centennial Symposium*, edited by Chauncey Starr and Philip C. Ritterbush, 39-52. New York, NY: Pergamon Press.
- Bush, Vannevar. 1945. *Science: The Endless Frontier*. edited by Office of Scientific Research and Development. Washington, D.C.: United States Government Printing Office.
- Carolan, Michael S. 2009. "Ethanol versus Gasoline: The Contestation and Closure of a Socio-technical System in the USA." *Social Studies of Science* no. 39 (3):421-448.
- Cherp, Aleh. 2012. "Defining energy security takes more than asking around." *Energy Policy* no. 48:841-842.
- Cherp, Aleh, and Jessica Jewell. 2011. "The three perspectives on energy security: intellectual history, disciplinary roots and the potential for integration." *Current Opinion in Environmental Sustainability* no. 3 (4):202-212.
- Chester, Lynne. 2010. "Conceptualising energy security and making explicit its polysemic nature." *Energy Policy* no. 38 (2):887-895.
- Ciută, Felix. 2010. "Conceptual Notes on Energy Security: Total or Banal Security?" *Security Dialogue* no. 41 (2):123-144.
- Cox, Robert Henry, and Daniel Béland. 2013. "Valence, Policy Ideas, and the Rise of Sustainability" *Governance: An International Journal of Policy, Administration, and Institutions* no. 2 (26): 307-328
- Dhaka, Ambrish. 2009. "The Geopolitics of Energy Security and the Response to its Challenges by India and Germany." *Geopolitics* no. 14 (2):278-299.
- Eaton, Weston M., Stephen P. Gasteyer, and Lawrence Busch. 2013. "Bioenergy Futures: Framing Sociotechnical Imaginaries in Local Places." *Rural Sociology*:1-30.
- Energy Resources Committee. 1939. *Energy Resources and National Policy*. edited by National Resources Committee. Washington, D.C.: United States Government Printing Office.
- Fairclough, Norman. 2010. *Critical Discourse Analysis: The Critical Study of Language*. London, UK: Pearson.
- Falkner, Robert. 2005. "American Hegemony and the Environment." *International Studies Review* no. 7:589-599.
- Ferguson, Charles D. 2009. "A Nuclear Renaissance?" In *Energy Security Challenges for the 21st Century* edited by Gal Luft and Anne Korin, 295-307. Santa Barbara, CA: ABC-CLIO, LLC.
- Foucault, Michel. 1984. "Nietzsche, Genealogy, History." In *The Foucault Reader*, edited by Paul Rabinow, 76-100. New York, NY: Pantheon.
- . 2008. *The Birth of Biopolitics: Lectures at the Collège de France, 1978-1979*. Translated by Graham Burchell. Edited by Arnold I. Davidson Michel Senellart. New York: Picador.
- Graves, Aubrey. 1953. "1500 Here to Study Natural Resources." *The Washington Post (1923-1954)*, December 2.
- Hornborg, Alf. 2013. "The Fossil Interlude: Euro-American Power and the Return of the Physiocrats." In *Cultures of Energy: Power, Practices, Technologies*, 41-59. Walnut Creek, CA: Left Coast Press.
- House of Representatives. 1961. House Select Committee on Small Business. *Small Business Problems Created By Petroleum Imports*. 87th Congress. November 20-22 and 24.
- Hughes, Larry. 2009. "The four 'R's of energy security." *Energy Policy* no. 37 (6):2459-2461.
- Jasanoff, Sheila, and Sang-Hyun Kim. 2009. "Containing the Atom: Sociotechnical Imaginaries and Nuclear Power in the United States and South Korea." *Minerva* no. 47 (2):119-146.
- Jelly-Schapiro, Eli. 2013. "Security: The Long History." *Journal of American Studies* no. 47 (3):801-826.
- Jevons, William Stanley. 1866. *The Coal Question: An Inquiry Concerning the Progress of the Nation and Probable Exhaustion of our Coal Mines*. London: MacMillan and Company.
- Klare, Michael T. 2007. "The Futile Pursuit of "Energy Security" by Military Force." *The Brown Journal of World Affairs* no. 13 (2):139-153.

- Kumar Singh, Bhupendra. 2013. "South Asia energy security: Challenges and opportunities." *Energy Policy* no. 63:458-468.
- Levidow, Les, and Theo Papaioannou. 2013. "State imaginaries of the public good: shaping UK innovation priorities for bioenergy." *Environmental Science & Policy* no. 30:36-49.
- Littlefield, Scott R. 2013. "Security, independence, and sustainability: Imprecise language and the manipulation of energy policy in the United States." *Energy Policy* no. 52:779-788.
- Lomborg, Bjørn. 2011. The Myth of "Energy Security". *Slate*, May 19,.
- Luft, Gal, and Anne Korin. 2009. "Energy Security: In the Eyes of the Beholder." In *Energy Security Challenges for the 21st Century* edited by Gal Luft and Anne Korin, 1-17. Santa Barbara, CA: ABC-CLIO, LLC.
- Maass, Arthur. 1953. "'Resources for Freedom'." *The American Political Science Review* no. 47 (1):206-210.
- Mallaby, Sebastian. 2006. "What 'Energy Security' Really Means." *The Washington Post*, July 3,.
- Margonelli, Lisa. 2009. "Energy Security for American Families." *Issues in Science & Technology* no. 25 (2):81-88.
- Masco, Joseph. 2010. "Bad Weather: On Planetary Crisis." *Social Studies of Science* no. 40 (1):7-40.
- Mitcham, Carl, and Jessica Smith Rolston. 2013. "Energy Constraints." *Science and Engineering Ethics* no. 19 (2):313-319.
- Mitchell, Timothy. 2011. *Carbon Democracy: Political Power in the Age of Oil*. New York, NY: Verso.
- . 2014. "Economentality: How the Future Entered Government." *Critical Inquiry* no. 40 (4):479-507.
- Nixon, Richard. 1971. "Special Message to the Congress on Energy Resources." June 4. Online by Gerhard Peters and John T. Woolley. *The American Presidency Project*. <http://www.presidency.ucsb.edu/ws/?pid=3038>.
- Noël, Pierre. 2008. "Challenging the myths of energy security." *Financial Times*, January 10,.
- Office of the Press Secretary. 2013. *What You Need to Know About the Energy Security Trust*. The White House, March 15, 2013 [cited October 11, 2013]. Available from <http://www.whitehouse.gov/blog/2013/03/15/what-you-need-know-about-energy-security-trust>.
- Ong, Aihwa. 2006. *Neoliberalism as Exception: Mutations in Citizenship and Sovereignty*. Durham: Duke University Press.
- "Past, Present and Future of the Oil War." 1927. *New York Times*, February 6.
- Program on Science Technology & Society. 2014. *STS Research Platform: Sociotechnical Imaginaries*. Harvard University 2012 [cited January 22, 2014]. Available from <http://sts.hks.harvard.edu/research/platforms/imaginaries/>.
- Resources for the Future. 1954. *The Nation Looks at its Resources: Report of the Mid-Century Conference on Resources for the Future*. Washington, D.C.: Resources for the Future, Inc.
- Rolston, Jessica Smith. 2010. "Risky Business: Neoliberalism and Workplace Safety in Wyoming Coal Mines." *Human Organization* no. 69 (4):331-342.
- Röpke, Wilhelm. 1998 [1968]. *A Humane Economy: The Social Framework of the Free Market*. Third ed. Wilmington: ISI Books.
- Ruijven, Bas J, Marc A Levy, Arun Agrawal, Frank Biermann, Joern Birkmann, Timothy R Carter, Kristie L Ebi, Matthias Garschagen, Bryan Jones, Roger Jones, Eric Kemp-Benedict, Marcel Kok, Kasper Kok, Maria Carmen Lemos, Paul L Lucas, Ben Orlove, Shonali Pachauri, Tom M Parris, Anand Patwardhan, Arthur Petersen, Benjamin L Preston, Jesse Ribot, Dale S Rothman, and Vanessa J Schweizer. 2013. "Enhancing the relevance of Shared Socioeconomic Pathways for climate change impacts, adaptation and vulnerability research." *Climatic Change*:1-14.
- Sheldon, Ruth. 1948. Oil: Prisoner of Man. *Nation's Business*, October.
- Shulman, Peter A. 2003. "'Science can never demobilize': the united states navy and petroleum geology, 1898-1924." *History & Technology* no. 19 (4):365-385.
- Smith, Crosbie. 1998. *The Science of Energy: A Cultural History of Energy Physics in Victorian Britain*. Chicago, IL: The University of Chicago Press.
- Sovacool, Benjamin K. 2011. "Seven suppositions about energy security in the United States." *Journal of Cleaner Production* no. 19 (11):1147-1157.
- Sovacool, Benjamin K., and Ishani Mukherjee. 2011. "Conceptualizing and measuring energy security: A synthesized approach." *Energy* no. 36 (8):5343-5355.
- Sovacool, Benjamin K., Ishani Mukherjee, Ira Martina Drupady, and Anthony L. D'Agostino. 2011. "Evaluating energy security performance from 1990 to 2010 for eighteen countries." *Energy* no. 36 (10):5846-5853.
- Teschner, Naama, and Jouni Paavola. 2013. "Discourses of Abundance: Transitions in Israel's Energy Regime." *Journal of Environmental Policy & Planning* no. 15 (3):447-466.
- The President's Materials Policy Commission. 1952a. *Resources for Freedom Volume I: Foundations for Growth and Security*. Washington, D.C.: United States Government Printing Office.

- . 1952b. *Resources for Freedom Volume III: The Outlook for Energy Resources*. Washington, D.C.: United States Government Printing Office.
- . 1952c. *Resources for Freedom Volume V: Select Reports to the Commission*. Washington, D.C.: United States Government Printing Office.
- . 1952d. *Resources for Freedom: Summary of Volume I*. Washington, D.C.: United States Government Printing Office.
- The Washington Post. 1953. "Resources For The Future." *The Washington Post (1923-1954)*, December 2.
- Toft, Peter, Arash Duero, and Arunas Bieliauskas. 2010. "Terrorist targeting and energy security." *Energy Policy* no. 38 (8):4411-4421.
- Toke, David, and Sevasti-Eleni Vezirgiannidou. 2013. "The relationship between climate change and energy security: key issues and conclusions." *Environmental Politics* no. 22 (4):537-552.
- Truman, Harry S. 1951. Letter to William S. Paley. Washington, D.C.
- Tsing, Anna. 2000. "Inside the Economy of Appearances." *Public Culture* 12 (1): 115-44.
- United States Congress. 1959. Joint Subcommittee on Automation and Energy Resources. *Energy Resources and Technology*. 86. October 12-16.
- United States Senate. 1954. Committee on Interior and Insular Affairs. *Stockpile and Accessibility of Strategic and Critical Materials to the United States in Time of War Part 8: Staff Study of the Paley Commission Report*. 83rd Congress. April 9.
- Valentine, Scott Victor. 2011. The Fuzzy Nature of Energy Security. In *The Routledge Handbook of Energy Security*, edited by Benjamin K. Sovacool: Routledge [electronic edition].
- Vietor, Richard H. K. 1984. *Energy policy in America since 1945: A study of business-government relations*. New York, NY: Cambridge University Press.
- Weszkalnys, Gisa. 2011. "Cursed resources, or articulations of economic theory in the Gulf of Guinea." *Economy and Society* 40 (3): 345-372.
- Wiles, Peter. 1953. "The Soviet Economy Outpaces the West." *Foreign Affairs* no. 31 (4):566-580.
- Yergin, Daniel. 2006a. "Ensuring Energy Security." *Foreign Affairs* no. 85 (2):69-82.
- . 2006b. "What Does 'Energy Security' Really Mean?" *Wall Street Journal*, July 11.
- . 2007. "Energy Independence." *Wall Street Journal*, January 23.
- . 2011. *The Quest: Energy, Security, and the Remaking of the Modern World*. New York, NY: The Penguin Press.