Frame envy in energy policy ideology: a social constructivist framework for wicked energy problems

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A Social Constructivist Framework for Wicked Energy Problems

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Abstract: This article deals with the nexus between energy policymaking and ideology. The article builds and expands upon a theoretical social constructivist analytical strategy, or framework, put forth for the purposes of conducting energy policy analysis. It then addresses criticism that this strategy constitutes "postmodern mush" that has no place in energy analysis before concluding with a review of why social constructivism has a significant role to play in building consensus and enhancing understanding between competing energy policy perspectives. The main contribution made by this paper stems from application of this ontological construct to the analysis of policies targeting wicked energy problems. The study cuts to the core about how energy problems are defined, interpreted, communicated, planned for, and potentially implemented via policy. Put another way, our study offers a timely critique or a call for reconceptualizing the process and practice of energy policy itself.

Keywords: interpretive frames; conceptual framework; analytical approach; epistemology; ontology; social constructivism

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1.0 Introduction

A picture, it has been said, is worth a thousand words. Yet, ask 1000 people to summarize in words what a painting means to them and we will find ourselves confronted with 1000 distinctly different descriptions. Ontologically, to post-empiricists, analysis of energy policy - indeed analysis of any public policy challenge - shares an allegorical similarity with art appreciation. The art aficionado possesses an individualized worldview through which a work of art is judged. Similarly, the artist who has fashioned a work possesses an individualized worldview which he or she attempts to communicate to others. When the worldviews of the aficionado and the artist converge, a connection is made and a sense of appreciation arises in the viewer. When the worldviews clash, disconnect and perhaps even discontent occurs. In other words, beauty lies in the eyes of the beholder, only because the vista that the beholder is viewing conflates with that person's perspective on beauty. The same can be said about energy policy analysis: two energy experts can be presented with the same data and derive opposing conclusions regarding how to contend with a given energy issue.

The inspiration for this article lies in a recent exchange concerning frames, ideology, and constructivism in energy policy research and interpretation. This basic premise - competing worldviews underpin clashing perspectives in energy policy analysis - provides the foundation of a work by Sovacool and Brown (2015). Sovacool and Brown (2015) argued that "assumptions and values can play a combative, corrosive role in the generation of objective energy analysis." In order to illustrate the types

of conflicts that can occur, the authors introduced eight competing energy "frames", which they contended represent dominant ideologies through which groups of people contest key energy issues. These illustrative frames were generated through an analysis of 15 conflicting energy issues as described in a broader monograph with Johns Hopkins University press (Sovacool et al., 2016). Both the book and the paper propose that conflicts could be attenuated by adopting six maxims that interested stakeholders could employ as a guide to better understand the drivers that underpin one's own perspectives on energy and the perspectives of others. Indeed, Sovacool et al. (2016) demonstrate how these maxims can be employed by analyzing competing perspectives on 15 essential energy questions.

In response to Sovacool and Brown's article, Felder offered a critique which concluded that Sovacool and Brown's paper makes "expansive claims that become less clear, less grounded and less helpful to its goal of reducing contentiousness through building common ground and improving analysis" (Felder, 2016, p. 712). In the conclusion to the critique, Felder took particular exception to the authors' introduction of ideological frames to illustrate how competing worldviews sire contention. Felder argued that frames are difficult to comprehensively catalogue and not necessarily the basis upon which energy decision makers carry out energy analyses. In turning to policy implications, Felder suggested that the main objective of the energy analyst should be to strive for empirically rational investigations and that analyses of competing values left to "philosophers in terms of substance and to political scientists in terms of process and governance" (Felder, 2016, p. 715).

In reading through Felder's critique, it became apparent to us that a response that extended beyond a simple communique was necessary to help avoid future misinterpretation of post-empiricist research by more carefully describing the sociological roots which underpin the analytical perspectives put forward by Sovacool, Brown and Valentine (herein referred to as the SBV social constructivist framework). More is at stake here than a mere disagreement between two studies, or disciplinary

perspectives. Although the ensuing discussion does center on the literatures of Sovacool and Brown (2015), Sovacool et al. (2016), and Felder (2016), it cuts to the core about how energy problems are defined, interpreted, communicated, planned for, and potentially implemented via policy. Put another way, our study offers a timely critique or a call for reconceptualizing the process and practice of energy policy itself.

To make this case, our argument will be presented in the following manner. Section 2 will expand on the theoretical foundations underpinning the SBV social constructivist framework. Section 3 will then draw from this foundation to demonstrate how Felder's critique (and others like it) not only misses the mark, but also validates our perspective. Section 4 focuses policy implications, and section 5 summarizes why the SBV social constructivist framework is valuable for seeking compromise in the face of wicked energy problems, that is problems, often intractable, that span across many agencies, organizations, and public members but also lack easily identified solutions (Weber and Khademian 2008).

2.0 Positivism, Post-empiricism and Public Policy

Harold Laswell, who is considered to be one of the founders of public policy, envisaged a field which was "multidisciplinary and contextual in nature" (Torgerson, 1985), and as such, necessitated contributions from political science, sociology, anthropology, psychology, statistics, mathematics and even in some cases the physical and natural sciences (Fischer, 2003). Policy analysis, which is a sub-field of public policy and represents the core theme of contention around which this article is based, has been defined by Dunn through a similar conceptual lens as "an applied social science discipline which uses multiple methods of inquiry and arguments to produce and transform policy-relevant information that may be utilized in political settings to resolve policy problems" (Dunn, 1981, p. 35). One of the key reasons cited for advocating multiple methods of enquiry were the limitations of individuals to

comprehensively understand and respond to complex problems. Herbert Simon referred to these limitations as "bounded rationality" (Simon, 1982). In Simon's view, the impact of bounded rationality on the policymaking process was that it encouraged policymakers to prioritize. He called the quest to simply get the job done, *satisficing* (Simon, 1982). In many respects, this was understandable because in the 1950s, the process of rebuilding from the Second World War consumed policymakers in most western nations. Economies were booming and policymakers were struggling to keep up with an unprecedented expansion of social services.

In the 1960s and 1970s, policy scholars circled back to two policy themes. The first theme, catalyzed by the social movements of the time, arose in response to a need to quantify the *effectiveness* of a given policy. It was fine that policymakers were responding to emergent problems (satisficing) but, were these responses having the desired effect and improving aggregate societal welfare? The second avenue of enquiry, largely driven by concerns over financial austerity – stemming from the oil crises of the 1970s and corresponding economic downturns – highlighted the need to evaluate the *cost effectiveness* of a given policy initiative. In other words, efficiency became an important feature of policy analysis.

A group of scholars who advocated a competing positivist epistemological approach to policy analysis served as the vanguard for the efficiency movement. One quest of this group was to seek a method of empirical-scientific inquiry that could help attenuate institutional paralysis in the face of value-laden stakeholder disputes over desirable policy directions. The goal as Bernstein (1978) described it was to employ scientific principles to "downplay the subjective foundations of social understanding" (Fischer, 2003).

Economics became ensconced as the vanguard field within the positivist movement. Promoted as a pseudoscience by its advocates, theorists in this field began to turn their sights on developing

methodologies to quantify what they call externalities - direct and indirect costs and benefits that a free market does not automatically internalize into the price of a product or service (Thampapillai, 2002). It was and still is the belief of many environmental economists that complete quantification of externalities represents the holy grail in terms of developing analyses which yield socially optimal solutions (Tietenberg, 2003). The seemingly obvious objection is that the calculation of externalities requires value judgments, thereby thrusting subjectivity into an otherwise objective analysis. As Frank Fisher notes in a critique of this position, "perhaps the main problem with modern-day neo-positivism, like its predecessors, is that it still deceptively offers an appearance of truth. It does so by assigning numbers to decision-making criteria and produces what can appear to be definitive answers to political questions" (Fischer, 2003).

This significant concern has not deterred politicians and policymakers from embracing economic theory as a dominant lens through which to analyze public problems. With good reason - economic theory has played an influential role in guiding economic development to higher levels of affluence, as seen through the metric of gross domestic product (Frank and Bernanke, 2007; Maddison, 2003). Yet as the human global population increases and resource consumption begins to diminish environmental carrying capacity (Valentine, 2010a), even experts indoctrinated initially into supporting the benefits of neo-classical economic theory began to realize that growth can be problematic in a world of finite resources and environmental sinks (Costanza et al., 1997; Daly, 1990; Stiglitz, 2002). These concerns have led some policy scholars back to the roots of policy analysis - roots that were firmly couched in sociological theory (Rochlin, 2014; Ryan et al., 2014). For some scholars returning to this conceptual homestead, one question stands out: Does a strategy exist which allows us to analyze social and environmental problems in a manner that does not devolve into a contest of competing values?

To answer this question, the notion of constructivism is essential. Constructivism posits that human beings "construct" understanding through a recursive process that involves comparing experiences (including interactions with others) with existing beliefs (Piaget, 1951). Social constructivism represents a subfield wherein scholars believe that worldviews are largely constructed through interactions with others. Under the social constructivist paradigm, the process of confirmation or disconfirmation of worldviews emerges as central to learning and sense making (Jonassen, 1999). Individuals acquire information or experiential knowledge through interactive cues (peer groups, schools, books, media etc.) and then over time, the aggregate body of cues serve to confirm or disconfirm understanding (Tam, 2000). This thus distinguishes constructivism or constructivist approaches from others summarized in Table 1 such as positivism, critical realism, and relativism (Geels et al. 2016).

Table 1: Social constructivism compared to positivism, critical realism, and relativism

	Positivism	Post-positivism	Relativism	Constructivism
Assumptions about the nature of reality	Reality is independent and objective (that is, empirical and measurable).	Reality is independent and layered, consisting of surface level 'events', mediating mechanisms, and generative structures.	There is no single reality, but multiple stories and narratives of different realities.	Reality is socially constructed through intersubjective meanings.
Explanatory goal and style	Deterministic: uncover general laws and relations between variables (and represent these mathematically).	Interpretive: explain processes by analysing actions in the context of structures, mediated by causal mechanisms.	Critical: uncover hidden interests and power structures, emancipate the silenced voices, raise normative questions (on justice, equity and fairness).	Interpretive: describe evolving meanings to understand reality construction.
Methodology	Experiment, model simulations, manipulation of variables and quantitative data.	Trace processes and event chains (quantitative or qualitative) and attempt to infer causal mechanisms and deeper structures.	Reveal contradictions and paradoxes, show multiplicity and alternatives, opening up debates.	'Follow the actors' in real-life contexts, describe interpretations, disagreements and (emerging) consensus.

Typical disciplines	Mainstream economics, system analysis and operations sciences.	Structuration theory and neo-institutional theory.	Critical theory, post-structural sociology, critical management studies, critical discourse theory and cultural studies.	Interpretive sociology, phenomenology and social psychology.
View on governance	Policymakers 'outside' the system, pulling 'levers' to steer developments.	Policymakers are part of the system and dependent on other actors. They can try to 'modulate' ongoing dynamics, but not steer at will.	Policymakers align with societal elites to protect vested interests.	Deliberative governance, based on consultation and participatory debate. Governance as open-ended learning process, based on experiments, projects and sense-making.

Source: Modified from Geels et al. (2016).

It should be intuitively apparent from a social constructivist perspective that if individuals construct worldviews based on individual experiences and exposure to the perspective of others, no one can be expected to share the exact same worldview across all contexts. In other words, people differ in their constructs of how the world works and these differences give rise to unique value sets and ideologies that can at times clash.

This relativity in perceptions is not necessarily a negative thing. In social constructivist theory, the clash between worldviews is central to learning (Bates and Sangra, 2011). Learning ensues when a competing worldview is put forth which challenges the learner's current worldview to a sufficient extent that they are encouraged to repudiate previous beliefs. If such a challenge is not successful, the person's original worldview remains intact and learning does not occur.

Constructivist theory feeds into the SBV framework in three important ways. First, the SBV strategy embraces the perspective that different worldviews exist because everyone is exposed to different social influences and environments. SBV offer eight worldviews that they called "frames" in order to try and illustrate why conflict arises in regard to energy policy analysis (Sovacool et al., 2016; Sovacool and Brown, 2015). However, as Sovacool and Brown pointed out in their article, these are just illustrative frames. Many more exist and, we would contend and expound upon later, it is not necessary to fully document these frames as Felder suggests (Felder, 2016, p. 712).

This leads on to the second connection to constructivist theory, the SBV framework posits that it is necessary to encourage dialogue between people who hold different worldviews in order to either facilitate consensus through learning or, failing that, to enhance understanding of the premises and values upon which people hold conflicting views. This latter goal can, in practice, aid in facilitating compromise between competing groups or in the case of SBV's 15 contentious questions, sire synthesized solutions that conflicting parties might be able to agree on. The German philosopher Hegel referred to this as progressing from thesis and antithesis to synthesis.

Third, and critically, the SBV approach takes a more holistic view of what constitutes a "frame" itself. We contend that frames are far more than simply "rhetoric" or an "approach", as Felder supposes. Without reflexivity, frames can become so embedded that they become inseparable from personal identity and can permeate well beyond the policymaking sphere (Wong, 2012). The tendency for frames to cut across analytical and policy dimensions has been extensively documented throughout the social sciences, with numerous examples from the energy and climate sphere as well. Indeed, even from the fringes of Felder's own field of economics, Amos Tversky and Nobel laureate Daniel Kahneman achieved global recognition for their work demonstrating how one's framing of issues influenced choice and decision outcomes (Tversky and Kahneman, 1981). In short, frames matter as a basis for discourse.

One need only peruse Pelling (2010) to see the salience of such frames when understanding views of climate vulnerability and cities, or Obeng-Odoom's (2015) analysis of the different frames for viewing oil and gas development in West Africa, or Hess et al.'s (2016) explication of competing frames in regard to renewable energy and energy efficiency. Indeed, we agree with Smith et al. (2016), who argue that frames within public and media discourses are a key driver of enhanced complexity within complex adaptive systems - the frames themselves influence data collection, knowledge, and policymaking in a mutually constitutive, cyclical relationship. To paraphrase these works: it is all but impossible to determine where an analytical frame ends, and a political or planning frame begins. What makes such frames even more difficult to identify is that often they exist subconsciously or surreptitiously – agents influenced by a particular frame may not even be aware that they are encumbered by such fetters, even when such a frame is founded in ignorance, or is "wrong" (Rayner, 2012; Stoknes, 2014).

One could say that most early positivists would accept the notion of multiple realities as put forth by social constructivists; however, they would also contend that scientific analyses of these competing realities can yield a preferred alternative that optimizes impact provided that the goals and criteria upon which optimization is judged are clearly established. Positivists contend that through scientific analysis even vexing social problems can be rectified through interventions that are both effective and efficient (Ritzer and Goodman, 2003). To economic positivists choosing an energy system for a given nation simply requires a process of quantifying all of the benefits and costs associated with each viable technological alternative. The alternative with the highest net benefit then becomes the preferred solution. This worldview is epitomized by the cost-benefit analysis (CBA) as illustrated by Felder in the context of energy efficiency analysis (Felder, 2016).

On the surface, the logic put forth by economic positivists possesses intuitive appeal. For example, consider a simple investment decision. Imagine that you are the CEO of a company that runs coal-fired power plants. You have US$2 billion to invest in a 1,600 MW plant. There are two prospective sites where this plant can be built and they are within 500 m of each other. Clearly, under such a highly simplified scenario – *ceteris paribus* ("with all other things being equal" is key terminology in the assumption-laden world of the economist) – one would likely choose the site that offers the lowest costs. Yet the straw-person that positivist economists create in proposing such a scenario begins to lose its stuffing as assumptions are relaxed and dissimilar alternatives are compared, requiring contentious assumptions about such issues as the value of human life, the impact of employment that has been displaced and subjective notions of technological risk (Stern et al., 2016). In short, it is simply not possible to carry out a CBA for most energy initiatives without making distinct value judgments at some juncture. As Ackerman and Heinzerling muse, we are left "knowing the price of everything and the value of nothing"(Ackerman and Heinzerling, 2005).

Subjective assessment of critical variables renders the positivist goal of a single quantifiable truth to be unachievable. While positivist economists might be attracted to the notion that they can scientifically reduce everything to a quantifiable pool of costs and benefits which can then be compared, the reality is that such economists must inevitably make judgments based on value propositions that are inherently subjective (Valentine, 2014). In other words, economic positivism is just another "frame" through which we can categorize decisions underpinned by similar (though not necessarily identical) worldviews.

Felder's critique is illustrative of a positivist mindset that fuels dialogues of the deaf when it comes to analyzing many energy issues (Scholten and Van Nispen, 2008; Valentine, 2010b). In the false hope that there must be a rational system upon which to quantify analysis of a given energy problem,

economic positivists fail to recognize that they themselves are living testament to the legitimacy of social constructivist ideology. To demonstrate why this is so, the next section explores the logic underpinning Felder's critique and his conclusions stemming from his energy efficiency case study.

3.0 The Subjective, Value-Laden Elements of "Objective" Cost-Benefit Analyses

In his critique of the SBV social constructivist framework – an exercise that he refers to as "postmodern mush" – Felder presents a "case study" of energy efficiency analyses to clarify his points. In his illustration, Felder asserts that there are five standard energy efficiency cost-benefit analyses (CBA) used by various states to analyze energy initiatives (Felder, 2016, p. 713-14). He argues that disputes over which of these competing CBAs is most appropriate primarily center on assumptions made in defining "terms" which set the criteria for guiding the analysis and on contention stemming from "empirical and methodological differences" (Felder, 2016, p. 714). Felder seems oblivious to the fact that "empirical and methodological differences" arise due to subjective decisions over which metric for analysis is most objective. To Felder, the cost-benefit analysis is a tool of objective merit that is derived from empirically informed judgement and as such, should be the prime basis for analyses feeding into the policymaking process.

Throughout his critique, Felder seems largely unaware of the fact that his examples, rather than contesting SBV's "postmodern mush", actually serve to reinforce the SBV social constructivist framework. As will be outlined in this section, CBAs depend inherently on assumptions that are largely based on ideological perspectives. One might be more optimistic than another regarding future energy costs. Another might be more conservative when estimating the cost of externalities. Optimism and conservatism are ideologically based constructs. In other words, whether he chooses to acknowledge this or not, Felder and his CBA advocates are guided by postmodern mush at many steps along the CBA path.

Indeed, Felder's failure to recognize the role of ideology in his advocacy of CBAs serves to highlight the importance of one of the six maxims that we recommend to help improve understanding when it comes to making energy policy decisions – the need for reflexivity. His inability to appreciate that many assumptions that go into CBA design are underpinned by ideological choices, typify oversights that have prompted our advocacy for increased self-reflection regarding the ideologies that guide sense-making. Digging deeper into his analysis of how CBA is used to evaluate energy efficiency helps to shed light on the contradictions that are inherent in his logic and that are easily explained within a social constructivist paradigm.

Felder unwittingly fortifies one of our key points when describing why energy analysts employ different CBA's. He argues that the CBA is "an analytical frame that applies a discipline to answer descriptive and normative questions" (Felder, 2016, p. 714). He contends that disagreements over conclusions of competing CBAs are often due to the deviation of actual versus expected energy market trends. As he puts it, "general trends in the energy sector map explain the *energy efficiency gap*" – a term that he uses to refer to "wide disagreement between analysts regarding the cost-effectiveness of energy efficiency programs" (Felder, 2016, p. 714). In other words, Felder appears to be arguing that the accuracy of CBAs varies because, due to uncertainty, assumptions that go into the construct of some models wind up being more accurate than assumptions that go into the construct of other models.

We would contend that in making this statement, Felder is validating one of our key points – amidst uncertainty decisions are made which rely on assumptions that are underpinned by worldviews. For example, forward-looking CBAs are challenged by a confounding level of subjective judgment because they must project future prices for energy technologies. Two CBAs looking at coal-fired power plant might come to vastly different conclusions about their viability depending on the assumed future price of coal that is being used in the analysis. Predicting fossil fuel prices is not an exact science; if it

were, there would be no futures markets for coal, oil, or natural gas. Consequently, any CBA that incorporates estimates of energy costs must be based on subjective evaluations.

Indeed, at many stages, CBA's must incorporate assumptions that depend on value-laden propositions, such as the value of premature deaths discussed earlier. Another example concerns climate change impact projections which should factor into most energy efficiency CBA's given the contribution that fossil fuel energy production makes to climate change. Ideally, in nations where energy is provided by greenhouse gas (GHG) emitting sources, when preparing energy efficiency CBA's, analysts should estimate a carbon cost to permit economic internalization of the GHG emissions that were offset by the energy efficiency initiative under scrutiny. However, economic estimates of GHG offsets are largely dependent on the perspective that an analyst possesses in regard to risk, because climate science is far from exact. Compared to a risk-tolerant analyst, a risk-averse analyst following the precautionary principle (a value-laden principle) might factor in a far higher carbon cost to fully account for uncertainties of climate change impact projections.

Felder is welcome to perceive such decisions as being empirically grounded but it is illogical to assume that value judgments do not play a role in any empirical assessment. To be fair, in his conclusion, Felder notes that ideological frames are not easily defined. He acknowledges that the delineation of CBA into five standard approaches could be interpreted as either five analyses within a single CBA frame or five independent frames. However, we contend that even delineating CBA approaches as constituting five ideological frames represents a flawed understanding of what an ideological frame is. It is a broad misunderstanding of constructivist principles to erroneously assign an ideological perspective to an object such as a CBA. Ideological perspectives are worldviews that people bring into an analysis. Things (like CBAs) do not possess ideological leanings, only people do. Employing our social constructivist framework, we would contend that people who undertake analysis using any of

the standard five CBAs would all possess different worldviews and if there were sufficient commonality in regard to worldviews shared by clusters of people, we could then empirically investigate the impact that this common world view has on the CBA process.

As is the case with most positivist scholars, Felder appears to be searching for a definitive roadmap to help conclusively identify one best approach to energy analysis. In his critique, he make statements such as “the S&B analysis could benefit from a more detailed articulation of the categories of the types of disputes that do occur in research literature”, “the S&B frames are a mix of political and social ideologies intertwined with academic disciplines and issue politics, which should be sub-categorized into these three areas”, and “it is a challenge for social science to establish a clear and distinct taxonomy that is applicable to all situations, and one could continue with such a detailed analysis of S&B’s eight energy frames, which would help flush out and arrive at the root causes of the disagreements that arise out of employing different frames”. All of these statements seem to suggest a desire to construct a comprehensive list of ideological frames so that positivists, such as Felder, can then decide which ideological mindset is most rational given the context of a given CBA challenge.

These types of statements highlight severe shortcomings when it comes to understanding post-empirical analysis. Identifying people as being “technological optimists” or “environmental preservationists” represent artificial constructs that social constructivists create to highlight elements of ontological difference that cause groups to possess conflicting worldviews. These are not prescriptive terms which necessarily define individuals. A person is not a technological optimist for life. A person possesses influential views of how technology relates to a given policy issue that “frame” their decision processes. This is why social constructivists create the artificial construct “technological optimists” to define an ontological mindset that is characterized by a belief that suitable technology will come along to solve a problem.

The notion of how a person frames an issue does not preclude a person from possessing other mindsets as well, or from their frame changing over time. For example, a person can possess traits that one might attribute to both technological optimists and environmental preservationists. A person possessing such a mindset might view environmental governance as an area that can be significantly enhanced through technology. A person may also change their frames based on experiences such as having children, learning a new skill, or refining their education and knowledge.

In such discussions, social constructivists might label a person to be a technological optimist or a positivist, for that matter, but it would be a mistake to interpret this in its literal sense. What social constructivists mean when they call someone a positivist is that the person possesses a worldview(s) on a particular issue (or issues) that tends to be heavily influenced by a desire to analyze something based on objective, empirically verifiable metrics. Individually, the influence of deeply held frames changes across contexts and evolve over time. This is encouraging as it implies that there is indeed hope that positivists will, through reflexivity, eventually become post-positivists.

Moreover, social constructivists challenge the notion that identifying an exhaustive list of ontological taxonomies would be possible or even desirable. The best we can hope for is to identify common ontological influences that help us to understand why people disagree. To this aim, the goal of the SBV perspective in regard to energy analysis is to begin to identify and understand the impact of competing ideologies when it comes to human decision-making processes related to energy. What Felder calls “postmodern mush” is something that social scientists consider to be ideological mosaics that are real and have meaningful impact on energy decision-making, whether Felder and his colleagues choose to acknowledge this or not.

Some of Felder’s critique comes down to confusion over semantics. Felder makes the point that one explanation of divergent evaluations in energy can arise due to “clarification of terms” such as the

boundaries of an analysis, discount rates, and relevant costs, etc. (Felder, 2016, p. 714). Felder appears to be arguing that if one were more specific regarding what one meant by terms such as *cost-effective*, *efficient*, and *benefit* (Felder, 2016, p. 714), differences between CBAs would vanish. This is only a partial truth. As we argue in our first of the six maxims (Sovacool et al., 2016), keeping up-to-date on trends in energy resources and technology and clarifying assumptions that go into the compilation of data analysis is valuable for helping people to understand the numbers presented in CBAs. However, as we illustrated earlier with our example of how projections over carbon cost and energy prices can differ based on ideological leanings, we would contend that clarifying terms will not, by itself, unify cost-benefit analyses.

4.0 Frames, Facts, and Implications for Policy

Despite these major disagreements with Felder's analysis, we would agree with some of his conclusions, while also arguing that our analysis is far more nuanced than Felder's critique suggests. First, he points out that "the notion of a frame may not be easy to pin down, particularly over time" (Felder, 2016, p. 715). We agree with this statement. However, we also believe that there are some dominant ideologies that appear to drive competing perspectives to many contentious energy issues. In our book, we argue that a discourse designed to share information, explicate competing values and seek compromise solutions can in the best of circumstances generate consensus or at least identify a synthesized perspective that competing parties can support (albeit reluctantly) in a manner which is as inclusive as possible.

Felder also argues that "just because a group of analysts are arguing within a frame does not mean that they necessarily accept that frame". This too is something we would agree with. Indeed, our maxim of reflexivity suggests that awareness of one's own ideological catalysts is possible and that self-knowledge can be useful in seeking compromise between parties who hold competing perspectives.

We are also willing to accept Felder's point that self-awareness can also be used strategically to achieve ulterior goals; but this does not detract from our position, it merely complicates the challenge of analysis.

Felder further makes a point that "there are other considerations beside the selection of frames" (Felder, 2016, p. 715). Aside from questioning whether people can always consciously choose frames for analyzing a particular problem, we would agree with the sentiment that values are not the only criteria that influence perspectives on energy issues. This would have been apparent if Felder had closely read the book from which the Sovacool and Brown article was extracted from. Table 2 lists six causes of contention that we have identified as being salient to disputation in energy deliberations (Sovacool et al., 2016). However, one would be hard-pressed to successfully argue that values do not play a role in any of the six causes.

Table 2: Six Causes of Contention in Energy Deliberations

Cause of contention	Explanation	Academic disciplines supporting this claim
Competing interests	Energy is big business and no one wants to lose when the loss amounts to one's livelihood.	Political economy, political ecology, geography
Complexity and change	Stakeholders base their support on data and technology projections that are contentious and change rapidly.	Engineering, industrial processes, innovation studies, energy policy
Risk and uncertainty	Differing interpretations of hazards and their implications can convince people to make poor decisions	Risk management, project management, social psychology
Undemocratic exclusion	Energy systems can exclude or marginalize people from the decision-making or licensing process	Social justice, contemporary ethics, legal studies
Values and ideology	Distinct systems of values and beliefs can lead to competition over what should be prioritized.	Political science, sociology, anthropology, cultural studies
Energy evangelism	Energy is such a heated topic that the outcome can become a matter of religious or political faith - downgrading or ignoring opposing information.	Sociology of expectation, group psychology, communication studies

Source: (Sovacool et al., 2016)

To illustrate, consider how complexity and change lead to differences of perspective. In explicating this cause in Table 2 we state, “Stakeholders base their support on data and technology projections that are contentious and change rapidly”. One implication here is that some people simply do not possess up to date information. Although one might be tempted to argue that lack of up to date information is not related to worldviews, deeper introspection invalidates this argument. People may lack current, sufficient scientific knowledge due to conscious choices they make concerning media exposure, openness to new information, and even social groups that they interact with. These influences are all impacted by subconscious choices that people make in the everyday course of their lives – choices that are guided in part by ideological influences.

As our sixth maxim further suggests, there is a high degree of technological entrenchment when it comes to decision-making in the energy sector and commitment to certain technologies blinds decision-makers when it comes to evaluating alternative technologies. Staunch advocacy of nuclear power in seismically active Japan (Sovacool and Valentine, 2012) and Malaysian support for ecologically invasive, large scale hydropower in rural Sarawak (Sovacool and Valentine, 2011) exemplify how path dependency takes on a life of its own. This illustrates that special interests and ideologies shape our interpretation of even the most uncontentious of facts.

Felder further suggests “although the S&B analysis and proposed maxims are directed at producers of energy analysis and research, perhaps it should be expanded to include reviewers and users of such efforts” (Felder, 2016, p. 715). Not only do we agree with the suggestion put forth, we would point out that at the beginning of the paper, we made it clear that the terms *decision-makers* and *analysts* refer to not only “the more traditional notion of policymakers and regulators but also ordinary students, jurists, homeowners, business persons, investors and consumers” (Sovacool and Brown, 2015, p. 38). Our perspective is that energy planning should be an inclusive process (our second maxim) and

that all people have a stake in this issue. Therefore, all people are subject to the same ideological forces that alter perception and frame support for certain energy outcomes.

Felder puts forth an additional recommendation that "policymakers and analysts should reject the notion that analysts are inexorably bound to their analytical frames" (Felder, 2016, p. 715). We would agree partially with this contention, albeit for different reasons. Felder advocates this in the context that energy policy is about more than just competing values, it is also about responding to concerns related to "health, welfare, and security of individuals, communities, and nations" (Felder, 2016, p. 715). Ignoring the fact that decisions made in regard to these elements are also subject to competing value-based ideologies, we would encourage extension of Felder's statement to recognize the nuanced nature of this issue. Analysts are not inexorably bound to their analytical frames but there is a high degree of policy entrenchment derived from ideological stickiness (Valentine, 2010b). Indeed, a critical premise of the SBV social constructivist framework is that through discourse, analytical (and ideological) frames can be altered. With that said, we also acknowledge theoretical contributions by Sabatier and Jenkins-Smith who argue that change, when core values are involved, is difficult, if not impossible (Sabatier and Jenkins-Smith, 1993).

However, we take issue with one of Felder's closing recommendations that "resolving value disputes is best left to the philosophers in terms of substance and to political science in terms of process and governance. Policymakers should not ask nor expect energy analysts to do that which is the domain of policymakers" (Felder, 2016, p. 715). First of all, this would suggest that particular subject areas belong entirely to particular disciplines or types of researchers. In the name of inclusion and well as interdisciplinary research, we reject such "disciplinary chauvinism", elitism, and exclusion outright (Sovacool et al., 2015). To put it in more colloquial terms, one doesn't have to be a medical doctor to contemplate death; a prostitute to understand sex; or a soldier to comment critically on war.

Second, value disputes cannot be resolved in the same conclusive manner as a disagreement over how many homeruns Mickey Mantle hit in 1961. Value disputes reflect competing realities. The misperception that value disputes are resolvable highlights Felder's ideological perspective, which is based on a positivist belief that there must be one answer that is logically best. This is not true in a world of over 7 billion people, all of whom possess different perspectives on what *logic* should guide the pursuit of *best*. The current political situation in the United States over post-truth politics and President Trump only strengthens this argument.

Thirdly, as we have demonstrated, the implied belief that "analysts" can actually provide some form of definitive quantitative judgment that is devoid of subjective interpretation or value-based assumptions is inherently misguided. In this paper and in our book, we provided numerous examples to illustrate this flawed notion.

Fourthly, the implied notion that policymakers are philosophical sages who sit atop bastions of power undertaking the sole task of melding "empirically objective" scientific and economic analysis into philosophical analyses intended to optimize human welfare is false. This view reflects, in our opinion, naïve understanding of policymaking and the impact that power and special interests have on agenda setting, policy design and policy implementation (Howlett et al., 2009).

5.0 Towards Better Informed, More Democratic Energy Policymaking

The SBV social constructivist framework that is detailed in *Fact and Fiction in Global Energy Policy* is likely a difficult pill to swallow for those who embrace the positivist notion that there is one optimal truth, one best policy prescription, one superior technology, or one ideal approach to energy research. Ironically, such a mindset is precisely what leads to dialogues of the deaf. Individuals or groups become so deeply committed to defending the verity of their perspective that they shut themselves off from emerging science that might otherwise alter their analysis. They become so embedded in their

preferred paths that they begin to overlook emergent risks. In an effort to seek validation of their conclusions, they don conceptual blinders – frequenting only the media sources that they know will confirm their desires or beliefs, aligning themselves with groups of like-minded individuals and ignoring information which might give them cause to question held beliefs. There is a wealth of evidence from the psychological literature on confirmation bias (Kunda, 1999; Nickerson, 1998), group polarization (Isenberg, 1986; Myers and Lamm, 1976) and motivated reasoning (Boiney et al., 1997; Kunda, 1990) that serves as testament to the omnipresence of this phenomenon. Due to these ideological fetters, biased analysts no longer view energy policy as a process designed to deliver a service to the masses. They see energy policy as a proxy for advocacy of preferred technologies. In short, the method becomes both medium and message.

If Felder would have bothered to fully read *Fact and Fiction in Global Energy Policy*, he would have encountered an important feature of our analysis. We contend that our six maxims are put forward as a framework for helping people to better understand their worldviews, the worldviews of others and the impact that competing worldviews can have on energy policymaking. We do not contend that the six maxims are panacea for contention, but instead a more sophisticated lens by which to view controversy. They can help to "improve analytical skills in energy governance and decision-making" (Sovacool et al., 2016, p. 345). We further note that these maxims have a universal quality. Specifically, we note "for readers who are members of the general public, this will make you better citizens; for policymakers, this will make you better practitioners" (Sovacool et al., 2016, p. 346). Table 3 provides an update from the book which restates the six maxims in a more personalized way in order to better convey why they may attenuate some of the conditions that can precipitate polarized disagreement and policy paralysis.

Table 3: Six Maxims of a Social Constructivist Framework for Energy Problems

	Maxim
1	Know the players – to reveal competing interests, understand where the power lies and how it manifests itself in energy decisions;
2	Inform yourselves – to counter rapidity of change, keep up to date and educate yourself about energy technologies and issues;
3	Be prudent about risk – to manage risk and uncertainty, attempt to make energy decisions that are based on clear ethical principles and well-informed by science;
4	Seek diversity and inclusivity – to avoid undemocratic exclusion and opposition by special interest groups, remember that energy decisions must meet the needs of a broad spectrum of citizens and stakeholders;
5	Practice self-reflection – to understand underlying ideologies, strive to become aware of your own ideological frames that might prohibit a balanced analysis;
6	Embrace technological agnosticism – to avoid energy evangelism, look beyond a given energy technology to the services it provides and recognize that many systems can deliver the same solution.

Source: Modified from Sovacool et al. 2016

This framework of maxims should not be misconstrued to suggest that extreme contention and polarized disagreement can be completely mitigated by applying the six maxims. Knowing the players and their vested interests will not stop powerful groups from deterring or derailing change, but it will help stakeholders to understand why elevated contention exists. Keeping oneself informed and up-to-date about energy technologies and issues will not guarantee interpretive consensus, but it will help to ensure that contention is not fueled by outmoded scientific understanding. Perceptions of risk will not be unified through explication of competing assumptions, but at least the basis for contention will be clarified. Seeking diversity and inclusivity might actually exacerbate conflicts by introducing new competing worldviews, but the process will at least resonate with the democratic right to be heard. Moreover, as management scholars well know, diversity and inclusivity, if managed effectively yield far more innovative solutions then silo thinking does (Whetton and Cameron, 2007). Practicing self-reflection does not ensure that a person can therefore objectively assess energy issues, but it at least sires an understanding that one's perspective might not be the only perspective. Finally, invoking the will to embrace technological agnosticism will not always result in unbiased analysis, but it will draw

one's attention to the constraints created by entrenched technological bias and help humanize energy choices by focusing on the services technologies are there to provide.

Felder's critique of the SBV social constructivist framework highlights how pronounced the hurdles are in trying to encourage shared discourse amongst individuals who possess strongly held ideological beliefs. Our maxims are not prescriptive, as Felder implies, nor exhaustive; nor can it be said that putting forth a list of maxims constitutes an act which "undercuts the very common ground" that we believe is useful for encouraging more inclusive, better informed energy planning.

It is our belief that the six maxims represent the foundation for conscious efforts that can be made to try and participate in energy policy discourse in a manner that is grounded in the humble acknowledgement that each person sees the world differently - beauty truly lies in the eyes of the beholder. These maxims are normative suggestions to help people find common ground by recognizing some of their own biases and then moving energy planning beyond the trenches of special interests. This is especially salient in light of the influential role that energy decisions play in regard to poverty alleviation, global health and environmental change.

Furthermore, a constructivist approach to wicked energy problems reminds us that they represent 'unstructured problems' (Hoppe 2010) with many uncertainties (about price/performance characteristics of individual technologies, consumer demand, social acceptance, long-term regulations) and fundamental disagreements and even resistance from vested interests (Verbong and Geels 2010; Geels 2004). This means energy sustainability problems have specificities that pose challenges for policymakers (Weber and Rohracher 2012) but also researchers themselves: such problems defy simple research designs centering on dependent and independent variables, or covering laws. Instead, a constructivist approach demands a comprehension of not only combinations of multiple causal mechanisms but also conjunctions between event chains, or what Ragin (2008) calls 'configurational

explanation.' This means that top-down rationalist methods, which may work well for structured problems, need to be complemented with other approaches, especially those emphasizing "second-best" policy mechanisms (Bennear and Stavins 2007) or "clumsy solutions" (Verweij and Thompson 2006).

Ultimately, it seems to be misguided arguing over the attractiveness of picture frames that hold priceless works of art – the frame is not the object that should take center stage, the art is. In a world when energy systems play such an influential role in exacerbating climate change or contributing to human insecurity, one would think the preferable goal would be to work toward establishing a discourse that would address this exigent problem. There are many paths that lead to a resolution and this suggests that there are compromise strategies that can be negotiated. Indeed, this is what *Fact and Fiction in Global Energy Policy* is all about – facilitating a discussion that does not fall on deaf ears. The SBV framework is therefore based on encouraging praxis over paralysis, inclusion over ignorance, and balance over bias.

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