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Politics as Distinction

Observing the future for sustainable energy

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There are many methods by which we observe 'the future' and it is common to refer to the collection of visions or images of the future as 'futures', and in this essay the latter term will be used interchangeably to refer to both the images and the practices that produce them. Futures are perhaps the primary way in which we engage with the future and a politics of the future for sustainable energy should therefore speak to the range of different kinds of futures. Previous work on this topic has however tended towards different politics for different kinds of futures, which raises the question of whether there can be (or needs to be) a general politics of the future (and/or futures)?

I argue that the answer to this question is yes. Beginning with an overview of the problem of observing the future (i.e., it is ontological and epistemologically different than the past/present), this paper lays out a conceptual framework for thinking about the politics of the future for sustainable energy that applies to all futures that share the aim of bringing more information into a decision-making process in the present. This common trait, I argue, suggests that observing futures is a *technological* activity. Building on this interpretation, I consider how three conventional perspectives on the relationship between technology and politics apply to futures, noting that though they are not wrong in this context, they are nevertheless incomplete. A fourth kind of politics plays an important role in futures and is, I argue, the underlying source of the controversy that seems to accompany what we might call 'politicized futures'. That politics is one of distinction-making and, in the case of sustainable energy futures, the distinction in question is between what is or is not realistic in our observations of the future.

Though this paper will not discuss the meaning of sustainability in connection with energy futures in great detail, it is perhaps a key aspect distinguishing the politics outlined below from the politics of energy futures proper. Suffice it to say, sustainability is understood simply to imply a desire to improve, in scale and over a longer time, the energy system's ability to provide energy services. Futures for sustainable energy therefore have some normative implications (i.e., they aim to change something in the interest of improvement). Such a broad definition of sustainability encompasses all the environmental, economic and social imperatives associated with energy systems, and is thus a defining shared trait for the politics of the future thereof.

The Problem of Observing the Future

The problem of observing the future is that it does not exist – yet. As such, the scope for certainty or 'true' statements about it is much less than for the past or present.[1] Though we could say with near

[1] Rescher, *Predicting the Future*, 70–71.

perfect certainty that the sun will rise tomorrow morning, such a statement is not at the time it is given true - even though the chance of the sun not rising is near nil, this occurrence can only be seen as probable, i.e., it can only be more or less likely to be true until the event actually comes to pass. Only when we wake up the next morning and witness the sun rising (or not), can we say that our initial prediction was in fact true.

That knowledge of the future can only be probable does not necessarily distinguish it from knowledge of the past/present – indeed, we often lay out theories of historical events that may be considered more or less probable given the evidence available, the strength of the reasoning, the support for the theory, and so forth. Some argue that even our most hallowed scientific theories might never be capable of graduating beyond the probable.[2] Probability is perhaps not the best foundation to demarcate knowledge of the future from knowledge of the past/present, but it is nevertheless a characteristic of our knowledge of the future. Recalling that the future does not yet exist however, we might say that a defining characteristic of the future (irrespective of the certainty of our knowledge of it) is that unlike events that have taken place in the past or are occurring at present, we have the ability to change the way in which the future events take place – or indeed if they come to pass at all.[3] In other words, how we think about the future very clearly, if not necessarily and intentionally, influences the way in which the future comes into being – few would argue that the future is 'mind independent' in the way the object of the natural world are, as according to a scientific realist. From this it follows that the knowledge we have of the future cannot be evaluated solely on the basis of its accuracy;[4] a dystopian scenario which, through its effective communication of the potential for disaster, managed to convince decision-makers to change course and thus render the initial observation inaccurate would still have served a useful purpose. Myths about the past could serve a similar purpose but in that case it is not the object of the myth that undergoes change but the one who learns from it. For futures, both the one who learns and the object of the observation can be changed.

Some might nevertheless argue for a fundamental determinism in the world that were we party to perfect knowledge of the world at present and its manner of operating we could definitively predict where it will be in the future. This kind of Laplacean determinism is perhaps outmoded; a more moderate position might claim that there are great many things about the world about which we can do little to influence the future of, either because it is set in some kind of natural law or because it is fundamentally indeterminate. No amount of forecasting is going to afford me the ability to change the numbers drawn for the next big lottery. Surely in these two cases I should seek the most accurate information possible – being privy to the actual numbers in advance of the draw would certainly be useful.

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[2] Ian Hacking's two companion works on probability document the emergence of this fundamentally different epistemology in the 17th and 18th centuries, culminating in the realization by C.S. Peirce that the foundations for science could only ever be probable. See Hacking, *The Emergence of Probability*; Hacking, *The Taming of Chance*.
[3] Jouvenel discusses this as the difference between *facta* and *futura* in Latin. See Jouvenel, *The Art of Conjecture*, chap. 1–7.
[4] Rescher, *Predicting the Future*, 55–56.

Certain knowledge of the indeterminate or uncontrollable is, however, only useful to the extent that we might change our own behaviour in relation to it. I might not have purchased a ticket had I not known the numbers in advance. The outcome (me winning the lottery) was thus contingent choosing to buy a ticket, a choice which was influenced by the information about the future that I possessed. Conversely, though I may not be able to change the probable fact that it will rain tomorrow, I can choose to bring an umbrella and thus remain dry in the event that it does. This *contingency* is a defining feature of the future, and colors the information we have if it in a way that information about the past/present does not share.[5]

And yet, the future cannot be *entirely* contingent on our behaviour and knowledge for if it were there would be little reliable that could be said of it – indeed, the whole notion of contingency presumes a regularity of cause and effect. Therefore if we want *useful* information about the future – that is, information that might improve decision-making – we must presume that some features of the future are fixed or determined (or least reliable) while others remain subject to our will, since the latter provide the basis for the causal assumptions that ground strategic behaviour and the former is required for strategic behaviour to be possible. Sorting out which is which, or where to draw the line, is an integral facet of the politics of observing the future for sustainable energy.

The technological nature of futures

The future, unlike other domains for knowledge and the gathering of information, differs in some key ontological and epistemological respects, at least for practical purposes (i.e., the question of determinism versus free will notwithstanding). In a practical sense, the information we derive from our observations of the future differs fundamentally from its past/present equivalents because the object does not 'exist' and, as such, its coming into being is much more directly tied to our understanding and expectations of it. The usefulness of this information has therefore more to do with effectiveness – or *instrumentality* - than it does with accuracy or precision. The combination of these two features makes the activity of observing the future different in nature than similar practices in the sciences or the arts.

It is (or perhaps was) common in the 'futures studies' literature to weigh in on the question of whether the observation of the future is an art or a science, though the precise meaning of the distinction is not always clear. In general, the presumption that it is possible to predict the future with absolute certainty has receded since the late 19th century, giving way to a greater emphasis on developing techniques to cope with the inherent uncertainty and probable nature of the future.[6] A rift slowly opened throughout the 1960s and 1970s between a disposition to observing the most likely future (typically associated with expert-led economic and technological forecasting and modeling and the development of techniques to produce consensus and accurately portray probability), and an emphasis on the

[5] Øhrstrøm and Hasle, "Future Contingents"; Jouvenel, *The Art of Conjecture*, 35.

[6] On early hopes for a science of prediction, see Cornish, *The Study of the Future: An Introduction to the Art and Science of Understanding and Shaping Tomorrow's World* for an overview; ; Gilfillan, "The Prediction of Technical Change" for an example. On coping with the 'inexact' aspects of prediction, see Helmer and Rescher, "On the Epistemology of the Inexact Sciences."

multiple possible futures (i.e., 'futures' not future) and the inherent subjectivity in visions for the future (in general found amongst those who study the practice of observing the future itself, i.e., futures studies scholars, or those who construct scenarios for possible futures).[7] Prominent failures of social scientists to predict or foresee prominent and disastrous events in the latter half of the 20th century (multiple oil shocks in the 1970s, the collapse of the USSR in 1991) reinforced growing disenchantment with the former disposition, while the successes of some corporations known to utilize scenario planning bolstered the latter's credibility. Nevertheless, many of the techniques and models of the forecasting camp have subsequently been incorporated into hybrid-type futures that employ both scenarios and statistical and econometric techniques, while regular forecasts often cannot now be found without sensitivity analysis and disclaimers about uncertainty attached.[8] Meanwhile, futures studies scholars increasingly point to the ethical and normative dimensions of 'futures', drawing attention to the role they play in articulating different beliefs and desires about the future and in how they can be used to convey particular visions about the good or just society and the implications thereof for action.[9]

It seems clear that futures have characteristics of both art and science, but cannot ever be fully one or the other given the unique problems of observing the future as noted above. I therefore propose that we think of the activity as *technological* instead. The word technology might conjure up images of electronics, physical tools like hammers or saws, maybe even more ethereal things like the internet or 'the cloud'. Perhaps the inclusion of 'technique' in the realm of the technological as noted above is also acceptable to the reader. The question then is, what do these things share in common with the practice of observing futures for sustainable energy? There are three qualities of 'the technological' that I believe justify the claim that futures are technological: their instrumentality; their methodical nature; and their practicality.

First, instrumentality is a defining feature of the technological. By instrumentality however we mean not that they are beholden to some definition of reason whereby the rational course of action reigns supreme (though this may indeed be the case for many), but rather that they are designed and intended to be used for instrumental purposes, for the purpose of achieving some desired outcome. They are 'tools' in that sense of the word. But more than that, as Ellul noted, they are means of achieving ends defined by their efficiency. There are often many ways to accomplish a task, but to utilize technology in that pursuit commits one to a measure of utilizing the most effective means available. In the case of futures, as noted above, the intended purpose is to produce information in order to influence decision-

[7] Jantsch, *Technological Forecasting in Perspective* is a good example of the former disposition, Jouvenel, *The Art of Conjecture* of the latter. On scenarios, Kahn, *Thinking About the Unthinkable* is an early example, while Schwartz, *The Art of the Long View* is indicative of its later descendants.

[8] The Intergovernmental Panel on Climate Change. Working Group III, *Emissions Scenarios* report is a quintessential example of the former type of analysis as it exists in the field of sustainable energy, using both advanced forecasting and modelling techniques, sensitivity and scenario-based analysis to convey a range of possible futures for global CO2 emissions trajectories.

[9] Meadows et al., *The Limits to Growth* is a good example of a future trying to make a point about the desirable future; Bell, "Making People Responsible" and Bindé, "Towards an Ethics of the Future" exemplify the ethical point of view.

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making in the present. The direction of this influence is not arbitrary, however; it is more often than not intended to inform more rational decision-making about the future, to extend the horizons of decision-makers, to facilitate consensus on the real nature of the problems we face. To that end, we aim to produce *useful* information about the future, information that faithfully serves the goals we have in producing it, information that will be a reliable guide for the implications of our actions. We must therefore utilize means that are efficient in the production of said information – some questions about the future are perhaps better served by different methodological approaches to observing it, though this is perhaps a controversial statement. At the very least, we might say that our methods of observing the future are often chosen and deployed in a *pragmatic* fashion.

The methodological aspect of observing futures is the second quality that makes the practice technological. We should not get too hung-up on the word methodology though, as it improperly suggests that there are explicit rules that govern the practice. This is not usually the case. Rather, we should recognize that, like the plethora of analytical approaches in the social sciences that informed by many different schools of thought and philosophies, the varied practices of observing the future are themselves 'methods' (or techniques) that are similarly shaped by the theoretical predispositions. Moreover, like research methodology, one needs to hone one's facility with the methodology over time – it is something at which one becomes skilled. The 'skill' aspect of observing the future is an important technological characteristic of the practice as it highlights its trade-like nature. One can become an expert in a particular methodological approach to observing the future through continued use and after time, contribute novel innovations in the method, and this process reinforces the skilled expert aspect of the practice of observing the future. The 'futures studies' literature sometimes refers to such experts as 'futurists', and many different professional societies exist for these people, though not all currently practicing the trade may accept the label.

Third and lastly, the technological possesses a creative aspect that is not always recognized in commonplace uses of term. The etymology of the word technology can be traced to the Greek *technê*, which is loosely translated as arts or crafts.[10] As an art or craft, forms of *technê* include activities such as cooking, householding or building, playing a musical instrument, carpentry, painting, or any other practice that requires a degree of skill. *Technê* is typically contrasted with *episteme*, meaning knowledge, especially 'scientific' knowledge. This simple distinction in many ways underwrites the equally crude contemporary distinction between *theory*, usually taken to be abstract, objective and precise; and *practice*, which pertains to the less academic, pragmatic and 'hands-on' elements of our daily lives.[11] For Aristotle, theoretical 'scientific' knowledge (*epistêmê)* was of the unchanging, eternal

[10] See the Online Etymology Dictionary, "Technology" and "Techno-", available from http://www.etymonline.com/index.php

[11] See Richard Parry (2007) "Episteme and Techne", *Stanford Encyclopedia of Philosophy*, available from http://plato.stanford.edu/entries/episteme-techne/. Parry takes issue with the veracity of this distinction in Greek philosophy, since a close examination of major authors reveals a less concise, often conflated usage of the two terms. Also, Martin Heidegger, "The Question Concerning Technology" in David Farrell Krell, ed. (1993) *Basic Writings: from Being and Time (1927) to The Task of Thinking (1964)*, New York: HarperCollins Publishers, pp. 318-319

"necessary truths" of nature and was distinguished by its certainty; practical knowledge (*technê)* was of contingencies, of things that 'admit of change.'[12] Technology can thereby be taken, at least in part, to be a form of knowledge that involves how to *do* something, whereas epistemology (the modern derivative of *epistêmê)* is the study of how to *know* something.[13] The emphasis on 'doing' rather than proving or theorizing I believe is indicative of futures practical nature.

But perhaps the technological is more than just practicality; for Heidegger, technology was "no mere means", but rather a process of revealing or 'bringing-forth' something into existence. *Technê,* he argues "reveals whatever does not bring itself forth and does not yet lie here before us, whatever can look and turn out now one way and now another." This revealing "gathers together in advance the aspect and the matter of [the art, craft or object being produced], with a view to the finished thing envisaged as completed."[14] *Technê*, and by extension technology, pertains to the human activity of revealing the possibilities of nature. Heidegger carried this further to make a critique of modern technology that we need not discuss here. Instead, what should be taken from this discussion is that technology is at once instrumental and more than instrumental – it is intended to accomplish a task, but in doing so it gathers together otherwise disparate elements or forces in the production of something novel or intentional. Observation of the future must create something novel based on the tools, data, and skill available at the time since there is no one true future to uncover.

Thus, if we consider technology broadly as a collection of things designed and utilized for their instrumentality, practiced and perfected in their employment by skilled professionals, yet also possessing an artistic element or practical component – a characteristic which when in the hands of a skilled user proffers that user a power to create something novel from disparate parts – it becomes clear that observation of the future is a more a technological activity than a science of prediction or an art of conjecturing. Not only is this a novel way of thinking about the practice of observing futures for sustainable energy, in setting in it this middle ground we also open up new ways for thinking about the politics of the practice.

Technological Politics and the Future

Insofar as we consider observation of the future an activity that is technological in nature, we might look at the literature on the politics of technology to address the sparse literature on the politics of observing

[12] Parry (2007)

[13] This distinction is clearly circumspect. Knowledge of how to do something no doubt requires at least implicit assumptions about the nature of the thing in which you are engaged, just as knowledge of a thing's 'essence' is a manifestation of a particular method of knowing, eg) empirical, analytical, hermeneutic, etc. The similar distinction in Popper's philosophy of science between methodological instrumentalism (what does … do?) and methodological essentialism (what is …?) is difficult to sustain, as will be discussed below in the section on performativity. Nevertheless, this distinction is itself instrumental for both practitioners and the theorists discussed below in understanding technology, and thus will be utilized for the same purpose here.

[14] Heidegger (1993), pp. 318-319. Recall Marx, "that which distinguishes the worst of architects from the best of bees is that the architect builds the cell in his mind before he constructs it in wax." Karl Marx (1976) *Capital, Volume One*, translated by Ben Fowkes, Toronto: Penguin Books, p. 284

the future. Here we find three perspectives on the fundamental connection between politics and technology:

1. Technology is apolitical
2. Technology is necessarily political
3. Technology can be inherently political

Below I investigate each in turn, noting their implications for sustainable energy futures, and thus for the politics of the future for sustainable energy, before turning in the final section to my proposed fourth way of looking at the politics of technology and/or observation of the future.

Politics as Corruption (The future is apolitical)

This perspective views technology as by itself *apolitical* – technology has no aims to accomplish and no vested interests in a particular outcome. Alone, technologies are mere tools, created by people to accomplish a specific task and that is all. Accordingly, technology can acquire politics if it is misused in some manner – directed towards a task that either is not its primary one, or by a user with who has a political intent. In other words, technology is only indirectly political and then only when it is corrupted by human political intentions. This perspective is equivalent with the 'guns don't kill people, people kill people' line, and is very common in the field of sustainable energy. [15] Here the seemingly widely-held view by the more technical professionals working in the field is that politics incessantly interrupts what should be an otherwise neutral and objective process of deciding on the optimum solutions to our energy problems. What is it that infects technology with politics? Typically parochial interests or ideas, ulterior motives, disingenuous discussion of the options – anything that interferes with the otherwise objective purpose or nature of the technology. [16]

The implication of this perspective for the politics of the future for sustainable energy more generally is that we should desire a process of observation that is free from interference by those with particular interests or axes to grind and place our trust in experts to produce a vision of the future that best serves society overall . In sustainable energy futures, the necessity of this criterion is heightened by the size of the stakes in the game (that is, the existence strong economic and political interests in particular outcomes) and by the necessarily normative dimension of the key issue (i.e., sustainability). We should strive therefore to remove any trace of politics from what has the potential to produce objective (or reliable, impartial, realistic) information in order to inform rational decision-making.

[15] Perhaps this is an artifact of the technical backgrounds of most people working in the field. As Hughes writes, "textbooks for engineering students often limit technological systems to technical components, thereby leaving the student with the mistaken impression that problems of system growth and management are neatly circumscribed and preclude factors often pejoratively labelled 'politics'." Hughes, "The Evolution of Large Technical Systems," 55.

[16] See for instance Galbraith, "The Politics of Forecasting" on politics, and Brown, "Engineers Can Build a Low-carbon World If We Let Them" for an example in practice.

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Politics as Natural (The future is necessarily political)

This view counters the first by arguing that technology can never be apolitical; it is necessarily and inevitably enmeshed in a social and political context. Accordingly, since technology cannot transcend politics and reach objective neutrality, we should therefore aim to choose technologies that suit our understanding of the social/political good. In the case of energy technology, we could note that there is no universal definition of a 'sustainable' energy system and that many people have different interpretations of what such a system could or should look like.[17] Given the competing normative visions for the future, we should recognize the folly in expert-led observation of the most probable futures and instead strive for open discussion of preferable – the debate is not over whether a given energy technology is really more or less sustainable, but rather whether it is desirable, given a certain social or political stance or perspective on the nature of the problem.

We find a similar argument in the literature on the politics of energy forecasting. Baumgartner and Midttun argue that the circa-1970s 'social-engineering' vision of energy forecasting (which ostensibly held that there is a 'one true' future and that trained, professional forecasters are best placed to divine this future) is in fact an anti-democratic, exclusionary way to think about the future (setting aside the question of whether or not it is useful or productive in different contexts, however, which Baumgartner and Midttun do not consider).[18] Instead of outlining only one future, we should recognize that there are in fact multiple futures at any given moment, based on the inevitable variance in subjective visions of the future. Instead of singular forecasts, we should present multiple scenarios; instead of probable we should talk of plausible and preferable futures; instead of expert-based observation, we should welcome the input of all people. The key point is that, because observation of the future cannot be 'lifted' out of the social and political world, and thus that the future is necessarily political, we should consciously adopt practices of engaging with it which conform to our (necessarily particular) visions of the social/political good.[19]

Politics as Concealed Intent (The future can be inherently political)

The third perspective holds that technology can be (but is not always) *inherently* political, meaning that certain technologies may enforce a specific social or political arrangement or institution. Langdon Winner gives two, slightly different examples of this phenomena. Following Lewis Mumford, Winner points to the technological complexity and centralization of nuclear power as more-or-less requiring a symmetrical structure in governance thereof: a complex web of centralized authorities, in-transparent to the general public, anti-democratic in its emphasis on technical expertise. Conversely, a decentralized wind power system would, at least according to Winner, reflect a different political system. A second example given by Winner is the bridges over the freeway running from New York to Long Island, which

[17] Lafferty, "The Politics of Sustainable Development" describes sustainability as an example of an 'essentially contested' concept, whose usefulness lies not in identifying the correct course of action but in serving as a normative ideal in decision-making and/or deliberation.
[18] Baumgartner and Midttun, "The Socio-Political Context of Forecasting."
[19] Baumgartner and Midttun, "Modelling in Self-Reactive Contexts."

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Winner argues were constructed by Robert Moses intentionally low so as to prohibit inner-city public transportation from reaching the 'ideal' beaches the infamous city planner was building there.[20]

At first glance, it might be hard to distinguish the third perspective from either of the above alternatives. The idea that politics is natural and necessary seems to cover the idea that some technologies have political implications (e.g., anti-democratic forecasting). The first perspective seems to cover the idea that technology can get 'corrupted' by political intent. So what makes the third perspective unique? Briefly, that in the third case it's the technology that has agency, not the human actors involved. Consider that in the case of the first perspective, technology is corrupted by human intent but if that intent is removed the technology then again becomes neutral – there is no lasting, embedded political intent within the technology. In the second case, certain technologies can be interpreted differently by human actors based on social and political values they hold, and as such we can choose technology to reflect those values. In the third case, the combination of value and choice are not as transparent and on the surface – rather, they are *concealed*, hidden within the technical details, the legacy of choices made long ago by designers with certain social and political values but that have faded from the public view or understanding of the technology. Politics in this view arises not from engagement with a technology but through the black box that technology almost inevitably becomes. And the more integrated into the fabric of day-to-day life the technology gets, the more insidious and pervasive the inherent politics becomes.

What might this third perspective look like in the observation of futures for sustainable energy? It's hard to say; the topic has not yet been specifically addressed. One might draw some analogies with work done by Donald Mackenzie on what he refers to as the "performativity" of financial economic theory in the latter half of the 20th century. In his book, "An Engine not a Camera", Mackenzie traces the development of financial economic theory from its beginnings in the mid-century, through the increasingly elaborate equations that eventually got incorporated into hand-held devices utilized by traders on the stock-room floor, and on to the feedback effects of the use of theory in practice which culminated, according to Mackenzie, in the multiple financial crisis in the 1980s and late 2000s. This kind of feedback Mackenzie argues goes beyond the conventional 'self-fulfilling' kind because it doesn't actually reinforce and thus make real its interpretation of the world, but instead becomes integrated in the world that it initially was only interpreting. As a result, the technology becomes 'an engine', driving markets, rather than a mere 'camera', observing them.[21]

Politics as distinction (What is or is not realistic)

The three perspectives above are at once only subtly different from each other but also incompatible. Despite the fine line between corruption by intent and concealed intent, it seems unlikely that one who subscribes to the idea that the future is by its nature free from politics would allow for elements within the techniques used to observe it to have inherent political implications, no matter the use or misuse of

[20] See Winner, "Do Artifacts Have Politics?"; Mumford, "Authoritarian and Democratic Technics."
[21] See MacKenzie, *An Engine, Not a Camera: How Financial Models Shape Markets*.

them. Similarly, while the proposition that the future is by its nature an object of political concern appears identical to the position that holds nuclear power implies centralized government, the likeness falls apart when we consider the extent to which the tools themselves are allowed agency – in the former perspective, futures only possess politics through their social context, not through their technical characteristics. This incompatibility pushes people to pick a perspective that best accords with their predispositions on the topic and then to interpret each instance through that framework, despite the sometimes awkward fit.

It is also not clear that any of the above perspectives on the relationship between technology and politics say much if anything about the *nature of politics* itself. For example, while it may seem intuitive that a self-fulfilling prophecy or 'performativity' in the sense used by Mackenzie are political phenomena, the criteria by which this is so are not elucidated. And neither does contestation based on conflicting values necessarily entail politics, though it would certainly be seen as such by proponents or supporters of the contested technology. It seems that despite a veneer of politics pervading the above perspectives, the political structure underneath remains obscure. There are as such two issues to be addressed: 1) the incompatibility of the three perspectives, and 2) their 'incompleteness' (lack of specificity as to the meaning of 'politics').

Controversy

First we must address the issue of incompatibility. Is this actually a problem that needs to be solved? Not really, or rather it doesn't need to be eliminated. The goal should not to be reduce the different perspectives into one, since to do so could just as easily be considered a political act and we are not aiming to be political (since we aren't fully clear on what that means yet), but rather just trying to come to an understanding of the many dimensions in which politics pervades the practice of observing the future. In other words, what we should try to do is to establish some common ground on which the different perspectives can each be located (this common ground is necessarily going to be general and devoid of features when compared to the particular perspectives noted above).

Despite their differences, there does appear to be a tacit consensus among the three perspectives that politics is somehow associated with *controversy*. Controversy, defined as 'disagreement, especially when prolonged, public and heated', is certainly a prominent feature in the discussion of the future for sustainable energy –the very concept of anthropogenic climate change remains controversial, to say nothing of disagreements over the more specific details of how to address it. I But does the existence of controversy suffice to signify the politicization? This much is not clear. Furthermore, not all disagreements are controversial (let alone politically so) - in many cases, the differences people have regarding futures for sustainable energy concern seemingly banal or technical questions about the reliability of data, modeling assumptions, the costs of a technology, or the potential of a resource. No matter how heated and public these disputes may get, it is not clear they deserve to be called 'controversial', nor political for that matter.

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The relevant question, therefore, is not whether the future is or is not 'essentially contested', but rather to ask what it is that enables disagreement (or, more generally, differences) about the future to become controversial? For instance, why is the idea of 'peak oil' controversial? Why does it arouse 'heated and prolonged' disputes that seem to differ from more friendly disagreement over the reliability of reserve data or methods used to estimate production profiles? Conversely, why do proponents of the second perspective often clash fiercely with those of the first? Why is it that scenario planners resent being called forecasters, and vice versa? And why exactly do we intuitively find the idea of 'self-fulfilling prophecies' indicative of 'inherently political' technology? We can see that regardless of one's preference for a particular perspective on the relationship between technology and politics (and, by analogy, between futures and politics), there is a common association (albeit a vague one) of politics - or, more appropriately, *politicization* – of the future with the presence of controversy. But we still have not addressed the second issue, namely the incompleteness of the perspectives noted above. To understand exactly what it is about controversy that is political, we must introduce a fourth politics, the politics of distinction.

Politics as distinction

Sartori writes, "politics is a most elusive term...We are seemingly unable to define it, and yet we incessantly charge one another with conceiving politics either too broadly or too narrowly, and/or of pursuing 'politicization', presumably a vicious extension of politics."[22] He suggests that if we are to properly distinguish politics from other aspects of social life (like economics or ethics), we must be able to define it conceptually (that is, what makes something political) and behaviourally (what it means to be acting politically – or, what is politics).[23] It should be clear that the kind of politics this paper aims to understand is not the type that produces resolutions, leads to compromise and consensus through deliberation, or is associated with governance of the kind that is 'therapeutic'. Rather, I wish to explain the 'vicious extension' of politics for the future of sustainable energy; namely, what it is about controversy surrounding futures that is political. The answer to this question lies in the unique features of the future discussed earlier, coupled with a fourth perspective on politics.

We noted above that the future, unlike the past/present, doesn't exist and its coming to pass is to some extent contingent on our observations of it. Like knowledge of the past/present knowledge of the future can only be probable, but so to can it be plausible or preferable and still be considered useful knowledge. Building on this moderated contingency, we noted that the practice of observing the futures is not strictly factual or value-based; as a *technological* activity, observation of the future is more

[22] Sartori, "The Essence of the Political in Carl Schmitt," 63.

[23] From an academic point of view, it makes much more sense to develop a rigorous, airtight conceptualization of one's discipline, in part because it helps differentiate and thus prove the additional value of the knowledge one produces from that produced by other disciplines. In the 'real world', so to speak, economic and political behavior might not be so distinct. Nevertheless, even though one act could simultaneously be political and economic (or artistic, religious, social, scientific, etc) it is useful to identify what broader *system* it is that provides the conceptual difference and from which the action draws its distinguishing characteristics. Take for example the decision to purchase organic rather than conventionally-farmed produce, an act which can be both economic and political but because it engages in two different systems that are not necessarily related with the actor's goals.

about effectiveness and efficiency (qualities that are derived in part from the skill of the observer) even when the future proposed is mostly normative. We thus have two characteristics of future observation – an assumption of partial (yet indeterminate) contingency and a technological commitment to utility – from which to begin to construct our account of the relationship between politics and controversy.

Given the partial contingency of the future, the observation of it relies in part on the presupposition that certain things will remain unchanged and are as such, for practical purposes, determined in the analysis – either by explicitly keeping them exogenous to the observation, or by implicitly assuming them to be certain and thus reliable. However, the question of what is or is not contingent is often uncertain, in some cases indeterminate, but always pertinent to the general utility of futures; a future which drew on unreliable resources to advocate for changing something that may already be a foregone conclusion would not be very useful. Conversely, futures cannot propose the physically impossible to resolve nagging social problems. For instance, no useful observation for sustainability will propose that the first and second laws of thermodynamics will somehow be invalidated by our technical ingenuity. Similarly (though perhaps more contentiously), no useful future will (at present) project that a completely clean, stable and secure form of fusion will be affordable and accessible enough in time to mitigate the worst consequences of anthropogenic climate change. But these two examples are different – violating the laws thermodynamics is impossible but the case of fusion power is merely implausible. Why should both however be criteria of 'useful' futures?

In the former case, an inviolable natural law enforces certain constraints on what can be plausibly said about future energy systems. A similar constraint imposed in the latter, not by the physical world, but more so by economics and consensus perspectives on technological potential. While the two kinds of constraints may be fundamentally different, few observers for sustainable energy would see fit to explicitly confront or state either in their observations. Such constraints exist more-or-less tacitly and external to the observation, presenting a boundary to plausibility, yet at the same time informing the analysis within that boundary. For instance, the consensus view that fusion is unlikely not only forces us to consider the alternatives, if helps define what are our real options – its absence serves almost like a control mechanism in a statistical analysis to determine significance. As much as they may be undesirable, such *controls* are nevertheless necessary to determine if what we observe is in fact *real.* But, as noted above, the future does not exist and as such nothing can be said about its 'real' properties. Whereas in philosophy and science a legitimate debate exists over whether or not objects in the natural world are indeed "mind-independent" or if "natural kinds" are really just artifacts of our intentionality, such a debate cannot truly be had about the future. When we observe the future, we are not observing potentially 'real' causal relations, but rather we are utilizing that type of knowledge – as well as our skill and creativity (i.e. we are being technological) – to do something quite different; to observe the boundary between the *realistic* and *non-realistic* future.

One might object that this predilection to realism is not always present among observers of the future, and neither is it a necessary condition of futures themselves – after all, a utopia is an idealistic vision for the future, and thus the antithesis of a 'realistic' future. To this I would offer two responses: 1) recalling

that futures are not predictions but rather observations to influence change in the present, their useful ness does not rest solely or necessarily on their accuracy (or, for that matter, its literal content), and 2) while specific observers or futures may indeed be more or less normatively or idealistically inclined, it is the *systemic process* of observing the future that produces a meaningful distinction between what is realistic or not to say or think about or include in our observations of the future, not (entirely) what individual people or groups have to say about it.

On the first point, it should be clear that idealistic visions of the future are the least like predictions, and thus the balance of the information they offer to inform decision-making is non-literal. Instead, that information is gained through contrast or comparison with the present, through rhetorical devices and moving imagery, through catchy or pithy scenario titles or alarmist and sensational warnings of impending doom. This does not qualify them as useless of course, because – as is quite evident from past examples – such futures often have more impact than their more literal cousins. So while the surface-level content of a future may seem more or less outlandish (depending on the observer), the informational content they produce only 'works' in the domain of realistic-ness. Thus, even in the most far-fetched or progressive visions for the future, there still must always be *some* intentional or unintentional editing of the content of that vision if the observer wishes to be taken seriously.

The second point is more essential to understanding the politics of the future for sustainable energy, but requires a systemic perspective in place of an atomistic one. The three perspectives above tend towards an atomistic conceptualization of politics, i.e., one that closely associates politics with the interests and ideas of people (or 'agents'). As noted earlier this perspective is not wrong, but it is incomplete - why should differences and disputes between people be a *political* issue, rather than a legal or social one? Similarly, why is haggling over a price an economic dispute and not a political one? Taking a systemic perspective helps to shed light on some of these questions, what does such a perspective entail? There is no shortage of literature on systems in the social sciences, and there is little space to comprehensively discuss them here. For the purposes of this paper, we only need note that systems are composed of processes rather than objects (though objects obviously exist within them) and there is no presumption that processes 'function' in some way to serve an imperative of the larger system (though they do make enable and constrain certain courses of action within the system).[24] The process we are most interested in from a political standpoint in the 'system' of futures observation is a process of *distinction* and the particular distinction that is being made, and which makes possible a politics of the future, is that distinction between realistic and non-realistic futures.

[24] Here I am drawing on the modern social systems theorist, Niklas Luhmann, rather than 'traditional' systems theorists from the mid-20th century. Luhmann devised a complex theory of social systems, in which the various sub-systems (law, politics, economics, etc) consist only of communications that construct a boundary between the system (i.e., things inside) and its environment (things outside) by 'coding' things taking place in society. For Luhmann, the code for the political system was government/opposition. See King and Thornhill, *Niklas Luhmann's Theory of Politics and Law*; Moeller, *Luhmann Explained: From Souls to Systems*.

So why is the systemic construction of a distinction between realistic and non-realistic in reference to the future *political* and how does it inform the question above about the connection between controversy and politics? In short, because the distinction implies exclusion: as a particular configuration of the in-group gets solidified through aggregation and repetition of the distinction, it becomes increasingly difficult to challenge the consensus view. As the camps become entrenched, members in each are 'policed' in such a way as to conform to the expectations of the group. In the case of futures for sustainable energy, however, we are not so much concerned with groups, group membership, and group characteristics as we are with the construction of a perception about what is or is not probable, plausible, preferable, and perhaps *prudent* in our visions of the future. As the distinction between realistic and realistic becomes increasingly distinct and clear, the nature of disagreements between people can more easily be associated with this systemic division. What were once minor technical differences now become political, as the opponent not only disagrees with you, but in fact challenges the very essence of your understanding of the future.[25] Disagreement becomes controversy, criticisms become allegations, and those allegations are made along one of the three perspectives of politics noted above: ie) the allegation of corruption, the allegation of exclusion, the allegation of concealed intent. As the notion of the realistic future becomes more prominent and widely held, the likelihood for intentionally-directed change to an alternative system decreases (i.e., "fossil fuels will remain the primary energy source for many years to come").[26]

Conclusion

Addressing the problem of climate change will require fundamental changes in the way we produce and use energy. Our efforts to observe possible sustainable futures are integral in shaping the way we think about this challenge, as well as the choices we make and paths we end up pursuing. Futures are as such the primary means by which we engage with 'the future' for sustainable energy. It behooves us therefore to consider the politics of futures in as comprehensive a way as possible. We should not limit our understanding of politics to the thing that gets in the way of progress, but nor should we therefore automatically associate a disposition towards objectivity or probability with political disenfranchisement of alternative perspectives. We should also not let ourselves replicate without challenging the fundamental distinction between realistic and unrealistic visions of the future – simply alleging your opponent is biased or corrupted by political interests, and putting forward your own subjective vision for the future as better, only helps to harden the distinction.

[25] My argument here comes from both Luhmann and Carl Schmidt, whose account of the 'concept of the political' as the distinguishing between friend and enemy was very influential. However, unlike either Luhmann or Schmitt, I do not believe it is necessary to attach the process of distinction to any specific opposition for the practice to become political, though I would agree with Schmidt that something about the intensity of the opposition makes it political. I think our intuitive association of politicization with controversy, i.e., heated and prolonged disagreement, suggests this could be the case. See Schmitt, *The Concept of the Political*.

[26] This is a message consistently found in one of the most prominent global energy futures, the International Energy Agency's *World Energy Outlook*.

Re-conceptualizing the practice of observing the future as technological is a step in the right direction. The technological attitude is a pragmatic one – one that continually seeks to figure out what in the future is contingent and what is not, and also one that seeks to resolve seemingly intractable disputes by looking at the problem differently, by changing one's point of view.[27] The process of distinguishing realistic from non-realistic futures is perhaps an inevitable and unavoidable consequence of our ability to recognize patterns and anticipate possibilities, but we should be cognizant of the danger that, under pressure from the massive amount and unceasingly production of contending information about the future, we draw the boundaries between the mainstream and the fringe too narrowly or tightly, thus bolstering the status quo and precluding the possibility for meaningful change.

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[27] James, *Pragmatism a New Name for Some Old Ways of Thinking*.

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