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Telling tomorrows: Science fiction as an energy futures research tool

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ABSTRACT

Any sociological discussion of energy consumption must necessarily deal with not only the social practices underpinning that consumption, but also the complex sociotechnical assemblages through which such consumption is enabled. Likewise any sociological discussion of climate change must necessarily deal with not only radically different contexts, but also the inherent uncertainty that accompanies any exploration of times yet to come. There are many ways in which one might narrate and/or critique such futures, but few which can handle all of the challenges mentioned above. Such work requires a medium and methodology which can: represent the social alongside the technological; move fluidly between micro, meso and macro scales; reconcile historical trajectories with extrapolated trends and speculative leaps; and – perhaps most importantly—speak across (and beyond) the disciplinary and administrative silos of both the state and the academy. This paper makes a case for the utility of prose science fiction both as a methodological tool of representation and portrayal for energy futures research which meets these criteria, and as a storehouse of tools and strategies for the critique of energy futures.

1. Introduction

> "You've got to create your own worlds. You've got to write yourself in."—Octavia Butler [17]

In this paper I make a case for the utility of science fiction as a representational tool for energy and climate research, or more particularly for "energy futures research", as per my title. I shall address the sometimes slippery matter of defining science fiction in a subsequent section, but first I should clarify what I mean by "energy futures".

I am casting the net of the plural noun "futures" as widely as possible, here, so as to cover the forecasts and scenarios of futures studies and strategic foresight (as practiced both within the academy and without), but also to capture the manifold *narratives of futurity* which are produced, reproduced and remixed well beyond the remit or control of those who profess a stewardship of, or expert insight into, "the future". I define *narratives of futurity* as a metacategory which contains all texts—regardless of medium or teleology—whose story extends temporally beyond the Now of the narrative's creation: this therefore includes profit and loss projections, political manifestos, business plans and advertisements for consumer products alongside research funding bids,[1] strategy scenarios, speculative designs and science fiction stories, and more besides. (For a more thorough discussion of narratives of futurity, please refer to [19].) Such an understanding of "futures" foregrounds a plurality which is nonetheless easy to understate: while the privilege of leading or steering public discourses of futurity are reserved for the fortunate few, there is no monopoly on the production (or, increasingly, the distribution or repurposing) of narratives of futurity, which can be found almost anywhere one finds people to whom futurity is a meaningful concept.

What then are "energy futures"? I have taken this term to refer to narratives of futurity within which the relationship between bodies and energy consumption differs from that which prevails in the present. If we approach energy futures through the lens of social practice theory, the term implies a rearticulation of the constitutive elements of one or more energy-consumptive practices, resulting in a changed performance (or performances) of said practice—in other words, *a new way of doing something*. (Or, more reasonably, a *different* way of doing something—for what is novel to one performer may not be novel to all.)

As deployed in the work of scholars whose work is particularly concerned with resource consumption (see e.g. [22,24]), the practice theory lens further implies an understanding of practices as being essentially tripartite, a function of the *meanings* informing the practice, the *competencies and abilities* which the practice demands of its performer, and the *material technologies and systems* which are enrolled in the performance. With regard to energy-consumptive behaviours in particular, the assemblage of technologies and systems utilised includes

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[1] We academics produce narratives of futurity as a routine part of our work, regardless of discipline.

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both the immediate interface technologies through which the performer initiates the practice, and the metasystemic tangle of infrastructures which enable the function of the aforementioned interface technology, which in turn mediates the relationship between performer and infrastructure. Or, more simply: it is understood that energy-consumptive practices enrol technological systems across a variety of scales, and that such practices shape (and are shaped by) the technologies and infrastructural systems that they enrol.

By way of example: a person who drives a petrol- or diesel-fuelled car is clearly reliant on the road network, but they are also reliant on the national network of fuel distribution (which is also reliant on the road network), which in turn relies upon a global supply chain of oil extraction, processing and distribution. Meanwhile, an electric vehicle might avoid the oil dependency, but only by replacing it with a dependency on the national electricity grid and the availability of compatible charging points. On one level, this can be seen as a matter of rational consumer choice, wherein the driver assesses their options and picks the optimal—and, indeed, this is how much behavioural research tends to frame it [23]. Practice theory, by contrast, emphasises the role of infrastructural affordances in shaping such choices: this is a matter of not only the differing affordances of the vehicles themselves, but the availability of the infrastructural functionality necessary for them to operate.

To speculate a little: the short operational range of an electric vehicle might preclude its being used by someone living in a remote rural location, because the supporting electrical infrastructure required for charging it does not extend out to the area in question, while liquid fuel distribution does; however, if that rural location happened to include a large solar PV farm, and the would-be traveller doesn't often drive far from home, the electric vehicle might actually work out to be a better option for them. The selection of an interface technology is at the same time the selection of a set of interconnected systems, even if it is not always understood as such: in this way, the affordances and availability of infrastructural function simultaneously enable and constrain the range of actions which might be taken by individual and collective actors. At the same time, socially constructed meanings modulate those choices: for some, the lower emissions (and environmental values) associated with the electric vehicle might make it the preferable choice despite distinct operational disadvantages, while for others, the romance of the internal combustion engine (or perhaps simply a contempt for environmental concerns) might trump more rational arguments. It is from this interplay between the social and the technical that the lived realities of practices emerge—and hence it is my contention that these relationships and dynamics must necessarily be captured by any useful portrayal of future practices.

In the following sections of this paper, I will outline what I consider to be the essential requirements of a methodology for the portrayal or representation of energy futures from the practices perspective, and then demonstrate that prose science fiction ('sf' hereafter) is capable of meeting those requirements; I will then warrant that claim by reference to historical and contemporary approaches to the portrayal of futures which are, to a greater or lesser degree, dependent on the specialised narrative and metatextual toolkit developed within sf as a literary genre. Finally, I will review a few hazards inherent in the form, and rehearse their rehabilitation as advantages in context, before concluding with a summary of the advantages and disadvantages of a science fiction-based representational methodology.

2. The portrayal of futures

2.1. On the purpose of portrayal

Before discussing criteria for the portrayal of energy futures, it may help to spare a few words on the matter of telos, or purpose: what might such portrayal achieve? After all, imagined futures are increasingly ubiquitous, not to mention banal; would producing more not merely add to the noise?

I would counter that it is precisely the ubiquity of banal futures which necessitates the production of richer futures, lest we cede the battlefield of futurity to salesmen and demagogues. But it's not merely a matter of contesting and critiquing simplistic narratives of futurity. We might think of it instead as a sort of speculative ethnography: a way in which to explore and evaluate practices and assemblages which do not yet exist, or which exist only as outliers. A narrative making use of the science fiction toolbox can propose a practice and critique it simultaneously; as such, this can be considered a form of prototyping or design practice.

However, narrative prototypes have a value beyond the bounds of sociology. The great advantage of story as a medium is that it can be used to depict complex ideas and phenomena in action without recourse to the sociological lexicon—in other words, narrative presentation can be used to despecialise topics which normally carry the taint of jargon and expertise, and depict them from the perspectives of everyday people. This in turn has the potential to open up discussion around energy futures, turning the discourse away from its current technocratic paradigm and towards a more inclusive, participatory process in which citizens can recognise their own experiences and perspectives. Critiquing development plans and white papers on infrastructural innovation is a specialist skill, but almost any literate person can engage with a story—particularly when it's a story that concerns their own future. I therefore see the honest and critical portrayal of futures (energy or otherwise) as a prerequisite to public participation in the shaping of technoscience: to paraphrase the infrastructure activist Jay Springett, we cannot have a conversation about something we cannot see.

2.2. The core challenge: sociotechnicality

Given the implicit assumptions outlined in my introduction above, I would argue that the core challenge in depicting any "energy future" lies in capturing the fundamentally sociotechnical nature of practices. Recall that a practice constitutes not only the *materiality* of technologies and physical action-in-the-world, but also the *sociality* of culturally-situated meanings and competencies. Given the innate bias of many portrayal methodologies towards either the material or the social (or, for that matter, towards the quantitative or the qualitative), such portrayals are 'incomplete' in terms of social practice theory: they simply don't (and in some cases, simply can't) present the full picture. If we wish to investigate and critique energy futures through the lens of practice theory, we must therefore find a portrayal methodology which is equally accommodating of the material and the social.

2.3. Secondary challenges: scale, temporality, subjectivity

The infrastructural underpinnings of contemporary energy-consumptive practices add further supplementary requirements to the above specification.

2.3.1. Scalar agnosticism

The portrayal of infrastructural enrolment in practices necessitates the ability to narrate fluidly across different geographical scales, from the granular detail of a particular performance to the abstracted complexity of national or even global infrastructural networks. Or, more simply: a suitable portrayal methodology must be able to bring a power-shower into the same frame as a power-station. As with scale in the material, so with scale in the social: the suitable methodology must be able to reconcile individual action with collective social dynamics, and portray them with a comparable fidelity.

2.3.2. Temporality

The portrayal of futures in general requires a reconciliation of the events of the past with the trends of the present; the portrayal of

infrastructural futures in particular hence requires a reconciliation of technological path-dependency and institutional obduracy with current paradigms of innovation, regulation and governance. In other words, the portrayal of infrastructural futures is necessarily reliant upon an understanding of (and a narrative sympathy for) infrastructural and technological history, both general and context-specific, as well as an understanding of the hegemonic status quo.

2.3.3. Subjectivity

Infrastructural futures necessitate a universal subjectivity—a recognition of situation and context, a foregrounding of the personal, and a refusal of the supposed objectivity of positivism that Haraway calls the "god trick" [6]. This subjectivity faces in two directions: towards the future(s) being portrayed, and towards the audience for the portrayal. Firstly, the plurality of practices-as-performances and the spatial and temporal heterogeneity of the infrastructural metasystem are central to questions of practice rearticulation—which is to say that the practices we seek to portray and analyse, while generalisable by teleology (practice-as-entity) are nonetheless always-already specific to their context (practice-as-performance); perhaps even uniquely so. As such, a suitable methodology will be capable of giving voice to those who are usually excluded from discourses of infrastructural futurity: this means not only the "end user" as performer, but also the other subjects—human, non-human and hybrid—enrolled into the assemblage.

Secondly, the suitable methodology must necessarily engage a wide audience—wide not only in the sense of transcending the disciplinary silos within the academy, or those between the academy and industry and the policy machine, but also in the sense of despecialising the narrative to the greatest extent possible, thus opening up the infrastructural futures discourse to contribution and critique from the excluded actors mentioned above (and, ideally, doing away with the obfuscatory policy euphemism of "the stakeholder" altogether).

3. The case for science fiction

With the strong caveat that any successful strategy for the portrayal and critique of infrastructural futures will likely draw on multiple methodologies and mediums rather than relying on just one, I would argue that science fiction meets the methodological specification outlined above.

At this point, it bears noting that the critical definition of "science fiction" is perpetually contested among both its fans and its scholars, as are the Venn-like relationships between science fiction and other generic constructs, such as fantastika (i.e. horror and fantasy literature; see [3]) and [u/dys]topia (see [18]). For the sake of brevity, I am here using "science fiction" to stand in for the collection of rhetorical and narratological strategies and tropes which have developed specifically for the purpose of using prose fiction to construct *narratives of futurity*. For our purposes here, it will hopefully suffice to say that science fiction's core advantage with regard to depicting sociotechnical futurity is that the representation of subjective experiences of sociotechnical futurity is exactly what the genre evolved to do.[2]

Prose sf is in some respects advantaged over and above sf in other media (e.g. film, design) because it allows for the seamless and simultaneous portrayal of the material realities of the storyworld and the subjective interiorities of the actor(s) inhabiting that storyworld. Or, more simply: written fiction can portray not only *what someone does and what they use to do it*, but also *why they're doing it*, as well as (crucially for us) *why they're doing it in that particular way*—which, restated slightly, are the three elements which comprise a practice.

Prose sf passes the core challenge, then; what of the secondary challenges? With regard to scalar agnosticism, sf has developed not only a set of techniques but entire aesthetic strategies relating to the portrayal of sociotechnical scale (such as the "Big Dumb Object" trope, which is concerned with the explication and/or exploration of massive and mysterious technological artefacts); this engagement with scale is identified by Csicsery-Ronay [4] as having its roots in the notion of the American technological sublime (see [15]), which in turn was a phenomenon rooted in public perceptions and imaginaries around new infrastructures.

Furthermore, by way of its intimate relationship to the utopian tradition (again, see [18]), science fiction has a deeply established capacity for narrating social structures at various scales which is rarely observed in other genres, if ever; this concern with systemicity and futurity in parallel has resulted in the evolution of structures and techniques which are intended to encourage speculation and critical thinking in the reader. (To be clear, this is not to say that other genres cannot narrate sociotechnical systems at scale, but to observe that they generally choose not to do so—and that it is the choice to tackle such topics which is arguably the truest mark of "science fiction", rather than any particular technique or trope; the techniques of science fiction are not guarded or arcane so much as they are overlooked and dismissed as somehow counter to 'literary' values.)

With regard to portraying temporality, this is arguably sf's *raison d'etre*! Nonetheless, it should be noted that the degree of historical accuracy and extrapolative rigour is highly variable across the genre, with some subgenres valuing it greatly (sometimes to the detriment of more literary merits), while others prefer to play fast and loose in the name of a more exciting story (or in the name of their favoured epistemology, which amounts to the same thing); the point being that prose sf is demonstrably capable of rigour with regard to temporality, but it cannot thus be presumed to be *inherently* rigourous.

The same applies to the matter of subjectivity: it seems obvious that prose fiction in general is the medium most able to portray the subjectivity of interior experience, as implied in the core challenge above, though careful choices with regard to narrative strategies can make this far easier and more effective. (For instance, both the first-person and third-person narrative modes (or "points-of-view") allow for the portrayal of character interiority, but their affordances differ when it comes to depicting causality and consequences which may not be directly apparent to the subject of the narrative; for a more detailed discussion of narrative strategies and the rhetorics of futurity, please refer to [19].)

But the question of subjectivity pertains to the audience of the story as well as its characters, and it is here that sf is again greatly advantaged, in that—while it has an internal generic discourse of its own—sf requires little or no specialist knowledge from its audience, beyond a basic level of literacy and a familiarity with the sociotechnical 'pop culture' of the milieu in which it was written. Which is to say that not only can sf portray all sorts of people and practices, but it can portray them in a manner which is as accessible to a literate citizen as to an academic, policy-maker or industrial leader. This potential for the "despecialisation" of technoscientific topics may be the greatest strength of sf with regard to the challenge of portrayal.

4. Past futures: precedents for portrayal

In outlining precedents for the use of (science) fiction in sociological work, I will pass over the history of futures studies and strategic foresight, because not only is that narrative already well-established (for a classic of the genre, see [1]), but also because those traditions, both within the academy and without, have traditionally ignored the more qualitative approaches to narratives of futurity in favour of quantitative predictions and deterministic epistemologies. The two dominant domains in which explicitly science fictional strategies have been

[2] However, this is also in some ways a disadvantage, in that sf has a lengthy and arguably structural tradition of technofetish and solutionist boosterism, and those rhetorics are to a greater or lesser extent tangled up in the genre's aesthetics and poetics, which in turn have leaked into countless other ostensibly non-fictional genres (e.g. marketing, politics).

celebrated and leveraged for the representation and investigation of futures are the utopian literary tradition, and the sociologies of science and technology (often known as Science & Technology Studies in Europe, and as "cyborg anthropology" in the United States).

4.1. The utopian tradition

A comprehensive archaeology of the utopian literary tradition is well beyond the scope of this paper. More pertinent here is a three-fold modality of utopias as seen through the lens of science fiction criticism; for a more thorough treatment, refer to [18].

Drawing on James [9], the three utopian modes are the *classical*, the *technological* and the *critical*. The *classical utopia* is a depiction of a perfected social order, whose canonical form is arguably Thomas More's *Utopia* itself. The *technological utopia*, by contrast, depicts a world transformed through the application of technoscience rather than through political means; this mode will be familiar to readers of "golden age" science fiction (whether the golden age of preference is the Gernsbackian or Campbellian), and to anyone exposed to the solutionist discourses of Silicon Valley. Lastly, the*critical utopian* mode is reflexive, in that it seeks to depict a utopian project undergoing its own inevitable failure or compromise; in doing so, it "undermines the notion of utopia as a deliverable project, but nonetheless clearly values the form as an experimental space for exploring its own consequences and failure-states" [18].

These modalities can be observed not only in the history of literature, but also in architecture, planning and urbanism. Critical design and "design fiction" practitioners in particular make use of the reflexive position inherent to the critical utopian mode, positioning those disciplines in opposition to the technological utopianism that permeates the glossy renderings of brochures for "smart cities" just as much as the slick advertisements of technology companies:

> "The critical utopia is not a strategy for a better world: it is a strategy for better strategies—and a necessary counter to the solutionist impulse that underlies all utopian thinking (including its own). The critical utopia further recognises that utopia is always-already subjective: that the good life, and hence the good society, is plural, contested, in perpetual flux [… it is] through the portrayal, analysis and comparison of many different utopias that the true utility of the form emerges: it shifts the critical focus away from what a society is, and onto what a society aspires to be; it opens up safe spaces in which those great ideals—social, technological or otherwise—may be (con)tested." [18]

Extending and clarifying the extensive deconstruction and analysis of utopian narratives performed by Fredric Jameson (e.g. [10]), Ruth Levitas has made similar (though far more elegantly formed) arguments for "utopia as sociological method", albeit from the (more purely sociologically-grounded) perspective of utopian studies rather than science fiction studies; see [14].

4.2. Social science fictions

The power and utility of rich prose narratives for sociological work is already well enshrined in the anthropological and ethnographical traditions—for what else is "thick description" but a detailed narrative which is based on observation rather than extrapolation and/or speculation? It follows that, so long as the narrative is never mistaken for (let alone deliberately passed off as) prophecy or prediction, "thick descriptions" of imaginary sociotechnical constitutions should be just as tractable to analysis as those of actually-existing (or actually-having-existed) sociotechnical constitutions. There are at least two notable figures in the sociology of technology who have explicitly advocated the use of science fiction as a methodological tool in sociology. Here's one such suggestion from Bruno Latour[3]:

> "The genre *[of science, or of science writing—Latour doesn't really recognise the distinction]* is made of a corpus of literary devices (or linguistic keys and frames) which can be empirically studied. All these devices can also be deconstructed by a careful use of other genres. It is no coincidence that many of the most fruitful insights into the workings of science have been made by people whose style is completely at variance with the usual scientific mode […] I recommend… that the student of science do some literary research, so as to become familiar with the stylistic tricks employed by scientists. By drawing on these two sources (fiction and science) the social scientist will soon realize that there is in fact only one large literary genre: that of science fiction (the best part of which is *not* written by science fiction writers)." [12], p. 211; emphases mine

Elsewhere Donna Haraway, whose cyborg metaphor [5] is arguably the best known operationalisation of science fiction in social science, has long argued for the value of sf as a writing practice for feminist theory. The following quote has proven very popular among feminist critics of sf:

> "Science fiction is generically concerned with the interpenetration of boundaries between problematic selves and unexpected others, and with the exploration of possible worlds in a context structured by transnational technoscience."—Donna J Haraway, as quoted in [8]

The genre Haraway describes above sounds ideal for the portrayal of energy futures!

That said, in the above passages, both Haraway and Latour advocate the use of *already-existing* sf texts as source material for new thinking and theory, rather than for the creation of fresh narratives from scractch—deconstruction instead of construction, we might say. It is my contention that, in this context, that distinction is irrelevant: both construction and deconstruction rely on the affordances of narrative, and on a storehouse of images, ideas and tropes (to which sociologists refer as "the technoscientific imaginary", and to which sf critics sometimes refer as "the sf megatext") with which to interrogate the relationships between people and their technoscientific context. If we can learn from taking things apart, as Haraway and Latour suggest, then surely we can also learn from putting things together.

Examples of sf in action as a methodological tool do exist, albeit put to slightly different purposes; Latour's *Aramis* [13] and Haraway's *ModestWitness@SecondMillennium* [7] are interesting examples, but both involve a blending of analysis with the narrative components. More recently, in the bluntly titled *The Collapse of Western Civilisation*, Oreskes and Conway [16] narrate the titular climate-change-induced collapse from the perspective of a surviving post-Chinese civilisation, hundreds of years hence; there is an immense affective power in their portraying climate change not as an imminent threat but a long-past *fait accompli*, but the impact is lessened by their choosing a corporate and academic narrator for the piece, in essence throwing aside many of the potential advantages of empathy and accessibility discussed above. By way of a more policy-facing example, Sonja van der Arend's *An Otter in Brussels* [25] uses a fictional narrative to explore questions of water quality in contemporary urban (re)development.

5. Present tense: some problematics of portrayal

Having made a case in favour of the tools of science fiction and science fiction criticism for energy futures research, it behoves me to raise some of the risks inherent in such an approach.

[3] It probably bears noting here that some science fiction scholars have used Latour's work on enrolment to argue the exact opposite of the above, namely that science fiction does not actually exist as a coherent genre, only as "an irresolvable series of discursive and material claims made for the [its] existence and nature" [2].

5.1. Today's tomorrows: the temporality trap

In my introduction, I referred to stories "extend[ing] beyond […] the Now of [a] narrative's creation". It is an established truism of science fiction criticism that a work of science fiction is never "about" the time in which its action is supposedly set, so much as it is "about" the time in which it is written. This can be considered as being analogous to the problem of path-dependency in innovation discourses: even assuming the free agency of actors in the world, the choices open to such actors are nonetheless to some extent constrained or limited by the obduracy of the technoscientific metasystem in which they are embedded. The same is broadly true of narratives of futurity, as they are inescapably products of the epistemologies and experiences of the present.

But I would argue that, far from dealbreaking the possibility of using science fiction in energy futures research, acknowledging this constraint sets a useful limit on the purposes to which it might be put—-which is to say that qualitative/interpretive deployments are fine, but that quantitative/predictive deployments should be treated with suspicion. Acknowledging this constraint also highlights the way in which the problem is inherent to all narratives of futurity, regardless of medium and intention, which advances the argument that all narratives of futurity can—and should—be critiqued on the same basis: much as science fiction is often read against the political, economic and technical circumstances attendant on its production, energy futures should be understood as being explicitly reflective of the present as perceived by their creators. Or, more simply: all energy futures share some textual characteristics which can be interrogated through the use of tools from literary criticism and narrative theory more broadly, and science fiction criticism in particular. That these tools will need some tweaking in order to do their best work is a given – but given the proliferation and plurality of narratives of futurity, energy-focussed or otherwise—a phenomenon very much enabled and accelerated by the tangle of infrastructures, interfaces, protocols and platforms to which we refer, ever more inaccurately, as "the internet"—imperfect tools are surely preferable to no tools at all.

5.2. Subjectivity and situatedness: the unevenly distributed future

However, we should be cautious, and avoid the temptation to conceive of "the present" in the same monolithic and problematic manner as "the future". Noted cyberpunk author William Gibson's insightful observation that "the future is already here, it's just unevenly distributed" [20] has become a cliché not only within sf circles, but within futures discourses more generally; like so many clichés, its ubiquity has dulled its power, but not its relevance. With regard to energy futures in particular, the unevenly distributed future is a condition of the present: this means that futurities are conceived of differently in different locations, and from different positions; they are ineluctably shaped by the conditions of the local present.

But we have Haraway's thinking on situated knowledges to act as a guide on our journey through the spatiotemporal subjectivities of energy futures:

> "Situated knowledges are about communities, not about isolated individuals. The only way to find a larger vision is to be somewhere in particular. The science question in feminism is about objectivity as positioned rationality. Its images are not the products of escape and the transcendence of limits (the view from above) but the joining of partial views and halting voices into a collective subject position that promises a vision of the means of ongoing finite embodiment, of living within limits and contradictions—of views of somewhere." [6], p. 590

Here Haraway offers not only the criteria for the production of more objective energy futures, but also the criteria for a critique of existing and emerging narratives of energy futurity. While problematic in isolation, the very partiality of narrative forms—their conflation and confusion of narrative voice and authordom, their inescapable subjectivity and narrowness—become their saving grace when considered in plurality.

"The future" is unknowable until it arrives, a plastic possibility only; prediction remains the province of charlatans, disciples of what Haraway calls "the god trick"—that managerial view-from-nowhere that pervades the positivist futurisms most beloved by policy. However, that plastic possibility is immanent in the path-dependencies of the present, however unevenly distributed it may be: we cannot hope to predict it, and perhaps neither can we realistically hope to shape it with anything like the degree of purpose and fidelity we'd prefer. But its constituent elements are already out there, in the countless energy futures being (re)told, in stories spoken by quiet voices as well as loud ones. The owners of excluded voices are more likely to come from the edges of the societal bellcurve, more likely to be constrained by their context in a manner that precludes their performing a given practice in certain ways; as such, their perspectives are perhaps more informative than those whose lives largely conform to the aggregates and averages of statistical analysis. If we wish to reshape energy-consuming practices, then we are in greater need of understanding deviation than we are of conformity—and deviation is, by definition, a function of the particular rather than of the general. Haraway writes of visions "of the means of ongoing finite embodiment, of living within limits and contradictions" [6]: if these are not already the core concerns of energy futures research, then I would offer that they're a great place to start from.

6. Conclusion

In this paper I have argued for the suitability of prose science fiction for the task of portraying energy futures (and, by implication, infrastructural futures in general) and examined a few precedents for such a deployment. In conclusion, I offer the following summary of the advantages and disadvantages of science fiction as a futures portrayal methodology:

In favour:

- **Cheap** *(Especially by contrast with more technical narrative media, e.g. video.)*
- **Flexible** *(Handles the mundane and the mind-blowing with equal facility.)*
- **Collaborative** *(While the writing process itself tends to be best achieved by someone sitting alone with a keyboard, the worldbuilding, characters and plot can—and should!—be co-produced with others, academic and otherwise.)*
- **Accessible** *(Low barriers to entry, both as contributor or audience.)*
- **Comes with a ready-made critical toolkit** *(The science fiction studies literature is very deep, and already well-connected to sociological themes.)*
- **Offers the potential of using pre-existing science fictions as "found futures" for critique** *(Given how many technoscientific themes sf writers have tackled already, a rich seam of research materials lies waiting to be exploited.)*

Against:

- **'Fuzzy', qualitative outputs** *(Social science fictions are highly unlikely to win over the policy sector without supplementary materials.)*
- **Delivery challenges** *(Almost anyone can write a story, but writing an engaging story that still carries all the crucial data is a challenge that really requires an experienced specialist; however, science fiction writers are perennially underemployed, so recruitment shouldn't be a problem.)*
- **Who speaks?** *(Just because fictions can be collaborative, accessible and inclusive, doesn't mean they necessarily will be.)*
- **The utopia-as-blueprint fallacy** *(The risk of portraying a potential or*

possible future which is then misparsed as predicted or promised future; this is a path-dependency problem generated by the lingering influence of the technological utopian mode in popular culture, especially science fiction cinema and tech advertising, and in the discourse of corporate foresight consultancy.)

Given my background as a writer, scholar and critic of science fiction, it surely behoves me to concede my inevitable bias! Nonetheless: I believe the potential of sf for portraying and infrastructural futures far outweighs its downsides, so long as the method is appropriately constrained and directed within the framework of a larger sociological enquiry. What form the work might take is an open question, although Schroeder (a practicing futurist, as well as a reputable science fiction author) has attempted to formalise the process of converting scenario data into fictional narratives [21]; meanwhile, new co-production and action research paradigms offer established and/or experimental frameworks for the collaborative building of story (as in Krzywoszynska et al. [11], for example).

The question of investigating and critiquing the resulting narratives likewise remains open: on what criteria should they be assessed, by whom, and to what end? In my own work, I'm drawn very much to the critical utopian mode; normative evaluation ("picking a preferred future") smacks too much of the sophistry of organisational foresight, for a start, and the greatest value of fiction lies surely in its being a soapbox where ideas might be tested to destruction without consequence (see again [18]). But it is my suspicion that the answer will always be contingent on the specific telos and aims of the project in which it takes place—and perhaps that's exactly as it should be.

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