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Urgency in energy justice: Contestation and time in prospective shale extraction in the United States and United Kingdom*Abstract*

Changes to the material and social systems that underpin energy infrastructures are inextricably linked to energy justice concerns, and the timeframes of those changes significantly affect their outcomes. Temporal aspects of energy initiatives and their impacts are thus an important site for examining emergent public views on new energy proposals, inequality, and energy justice. We propose *urgency* is a particularly rich concept through which to study (i) the justice and socioenvironmental implications of energy systems and technological change and (ii) how people make sense of contested energy timeframes. Here, we present findings from a series of public deliberation workshops held in the United States and United Kingdom to discuss projected impacts of shale oil and gas extraction by hydraulic fracturing. We encountered critical similarities across sites, as in widespread public resistance to issue framings that foreground urgency-based claims in support of their objectives. Participants assessed energy initiatives with particular reference to temporality and urgency, and we argue these views raise justice concerns regarding distribution, the creation of environmental inequalities, public participation, and recognition. We also suggest a focus on urgency provides fresh perspectives on justice issues surrounding the speed and direction of technological development in general and of energy transitions in particular.

Keywords:

Energy justice; urgency; fracking; shale development; temporality; energy transitions

1. Introduction

Energy justice addresses inequalities in how energy is produced, distributed or consumed around the world. Developed as both an analytical and practical decision-making concept (Hall et al. 2013, Sovacool and Dworkin 2015), energy justice builds on decades of environmental justice work addressing systemic marginalization, the uneven distribution of ills and benefits across societies, and disparities in the recognition of diverse voices within decision-making procedures (Bullard 1996, McCauley et al. 2013). A number of scholars have argued that changes made to energy infrastructures are inextricably linked to justice concerns, and the timeframes of those changes significantly affect their outcomes (Sovacool 2016). For example, recent analyses of energy transitions have assessed their capacity to create or exacerbate inequalities (Ottinger 2013, Fouquet 2016), highlighting the effects of different speeds of transition, what the impacts are, who wins, and who loses (Sovacool and Geels 2016). Analyzing the temporality and relative speed of interventions in ongoing socio-historical processes also supports the study of environmental injustice as a dimension of those processes and not merely an outcome of isolated events (Pellow 2000). We propose *urgency* is a pivotal concept both in researching the justice and socioenvironmental implications of energy systems and technological change and in understanding how people make sense of contested energy timeframes. Here, we focus on public views on prospective shale oil and gas extraction in the United States and the United Kingdom.

Shale development is contested in both countries, as are urgency-based pleas made by governments and other actors in support of its rapid implementation and expansion. For some supporters, there is an urgent need to capitalize on shale extraction to potentially increase economic activity, reduce fuel prices, stabilize energy supplies, or to use gas from shale in energy generation as a ‘bridge fuel’ in the transition from high-carbon coal to alternative low-carbon energy sources (Jacquet 2014, Stern and NRC 2014). Opponents of fracking highlight the urgency of preventing its negative impacts, including localized environmental and social costs and, globally, its contribution to climate change through growing fossil fuel production (Broderick et al. 2011). This paper draws on qualitative data from a series of deliberation workshops we held in the US and UK to discuss documented and projected impacts of shale oil

and gas extraction, its role as part of wider changes to energy systems, and conflicting claims made in popular and political discourse in support of or against different energy initiatives.

2. Background

2.1 Urgency, risk, and energy justice

Prior deliberative work on nanotechnologies and geoengineering has found notions of urgency highlight important issues of risk, benefit, harm, and inequality (Pidgeon et al. 2009, Harthorn et al. 2012b). Urgency as a theme emerged when people discussed technological developments and their impacts as being located in an immediate temporal plane and when these impacts were considered to be pressing, acute, present, imperative, timely or similar. Urgency also appears when short-term concerns, needs and views are emphasized and/or prioritized over those that operate in the longer-term or are associated with precaution, increased regulation and ‘techno-skepticism’ (Pidgeon et al. 2009). This happens, for example, when perceived urgency about short-term issues filters out or attenuates longer-term societal and environmental concerns.

An analytical focus on urgency thus facilitates, among other topics, the study of tensions between views on different timeframes of energy initiatives and their impacts, as well as the effects of urgency in government and corporate rhetoric on those views. Notions of urgency often appear in the framing of energy initiatives, particularly with reference to increasing energy demand (Dirks et al. 2014). Urgency discourse and framing are also common in the world of emergent technologies, where market forces and the accelerated pace of innovation are said to create a ‘tyranny of urgency,’ creating challenges for regulators and often prompting calls for moratoria to slow down development (Lee and Petts 2013). Urgency as a concept is thus an important dimension of core concerns for risk research, science, technology and society (STS), and energy justice, and thus warrants further focused analysis.

In findings from our previous deliberations on energy applications of nanotechnology in the US and UK, we note that perceived urgency of meeting current and projected future levels of energy demand was surprisingly strongly linked to public support for new nanotechnologies for energy applications, although this was somewhat tempered by competing concerns about energy

conservation and efficiency (Pidgeon et al. 2009). The case of nanotechnology energy thus produced an urgency-based risk attenuation effect, notable in contrast with nanotechnologies for health and therapy, about which publics in both countries were more risk sensitive or ambivalent over distributive justice issues (Pidgeon et al. 2009). This is unlike, for example, perceived risks and benefits of genetically modified foods in the UK, where ambivalence manifested as high perceived technological benefits working in concert with high perceived human health risks and lack of trust (Poortinga and Pidgeon 2005). The specific case of shale development presents a unique field for further examining interrelated issues of temporality, urgency, risk, and (in)justice since it is deeply implicated in overlapping local, national and global dimensions of energy system change.

Addressing such cross-scalar dimensions, energy justice has emerged as a framework for analyzing and redesigning the social and material relations that constitute energy systems. Engaging core tenets of distributional, procedural, and recognition justice (Jenkins et al. 2014, 2016), energy justice scholarship has expanded beyond a focus on fuel poverty and siting issues to also address questions of “cross-boundary impacts” of energy policies, activism, and ethics (McCauley et al. 2016). Such work has also addressed potential intergenerational inequalities that result from energy systems, and the risk of environmental damage impinging upon the ability of future generations to achieve their conception of the good life (Barry 1997, Schlosberg 2007). Drawing on established theories of distributive justice (who experiences what risks, harms and benefits across society, as a result of what principles of distribution), procedural justice (who participates in decision-making processes), and cosmopolitan justice (that justice principles must apply globally), Sovacool et al. (2014) developed prohibitive/affirmative principles of justice that identify access to energy as a fundamental basis for material well-being, which itself is threatened by externalities and costs that result from energy systems. For people living without ready access to energy, this can be one among a number of urgent needs including healthcare, water, sustenance, shelter and employment (Islar et al. 2017). Work on energy justice as a decision-making framework has also addressed the need to establish policy-applicable mechanisms for energy availability, affordability, accountability, and sustainability (Sovacool et al. 2016).

The work of environmental justice activists and academics offers strategies for further refining energy justice approaches, including systematic interrogation of the racialized relations embedded in the creation and perpetuation of environmental inequalities (Bullard 1996, Pellow 2000), and questioning the ‘why’ of inequity, rather than relying on philosophical or ideal schemes of justice in liberal societies, while also examining social histories that impede the functioning of those schemes (Young 1990, Fraser 2000, Schlosberg 2004, p. 519). Individual and community empowerment, both as a pivotal legal strategy and a foundation for grassroots political action (Cole and Foster 2001), has also been identified as a means for achieving comprehensive justice objectives (Schlosberg 2007). Such justice concerns are not easily addressed by urgent measures or short-term initiatives. An analytical focus on urgency thus responds to the need for a critical perspective on process and temporality in justice issues while also scrutinizing how decision-making undertaken in conditions of urgency may contribute to or work against empowerment and the realization of justice aims.

2.2 Shale extraction, urgency, and climate change

Shale development offers a particularly illustrative case through which to study the temporal dimensions of energy system change. Energy policy in the UK has been subject to political ‘streamlining’ and the introduction of policy mechanisms specifically to expedite energy development, at times with the effects of diluting environmental protection (Cowell and Owens 2006) and curtailing opportunities for participatory decision making (Groves et al. 2013). In particular, UK governmental support for ‘going all out for shale’ and stimulating shale development has, along with official Acts on Planning and Localism, led to fracking-related reform measures with the aim of streamlining planning and consent applications (Cotton 2017). In recent decades in the US, direct government investment in fracking-related technologies has helped facilitate a rapid and significant increase in domestic oil and gas production through a ‘shale revolution’ involving many different states (Trembath et al. 2012, EIA 2015). In addition, in both countries, the development of shale resources has become central to policy and political rhetoric around issues often described as ‘urgent’ such as climate change and energy security (Phadke 2013). Shale development thus offers a critical site for exploring the discursive and ethical aspects of urgency and arguments for streamlining framed in terms of urgency.

Supporters of shale development promote shale gas as cleaner-burning than coal in electricity generation and suggest the expansion of fracking operations could help nations to reduce their CO₂ emissions (HL-EAC 2014). Opponents of shale development, however, take a contrasting view on the relationship between US shale extraction and climate change mitigation (Broderick and Anderson 2012, Partridge et al. 2017, Thomas et al. 2017b). Continued global extraction of shale gas, for example, threatens to perpetuate existing patterns of energy use and generation (Westphal 2013), competing for investment and political support and potentially displacing or delaying the uptake of ‘zero-emission’ nuclear energy and renewables (Sovacool 2014). Some environmental groups in both the UK and US assert an urgent need to reduce global use of fossil fuels within current energy systems, and thus call for limiting or reversing the expansion of fracking (Broderick et al. 2011, Perry 2012, Willow and Wylie 2014). In both countries, current systems of governance for fracking have been linked to a number of justice implications due to procedural inequalities and democratic deficits (Cotton et al. 2014, Whitton et al. 2017).

The promotion of shale gas as a low-emissions energy source highlights how perspectives on urgency in relation to climate change are varied and contested. These variations have been identified as a hurdle to adaptation and mitigation efforts because a sense of urgency and of responsibility have been found to be requisite conditions for action, in addition to risk awareness and institutional capacity (van den Berg 2011). A lack of perceived or explicit urgency on the part of the public is one of the most frequently cited impediments to desired amplification of climate change risk and related behavior change (Pidgeon and Fischhoff 2011). McCollum et al. argue that energy policy makers engage with three key objectives (one of which is climate change mitigation, as well as security of supply, and reduction in air pollution) according to the perceived urgency they attach to each, with energy security and pollution concerns frequently considered more urgent (McCollum et al. 2011). Climate change is thus an important but not exclusive energy-related issue where perceived urgency can lead to competing objectives and related justice claims being differentially addressed, prioritized, or overlooked.

2.3 Urgency, institutions, and procedural justice

A focus on urgency engages energy justice scholarship with work in the social sciences on temporality and (mis)alignment between societal assessment and technological development. In

policy studies, the notion of systematically slow or insufficient responses to risk on the part of decision-makers has been classified as policy underreaction (Maor 2014). Here, however, we draw on critiques across the social sciences that move beyond assessment of particular policy actions and judgments in order to analyse the broader social context, socioecological consequences and justice implications of policy decisions, particularly those related to energy development. Such critiques address governments and other powerful institutions and their handling of urgent issues – often seen as acting either (i) with insufficient urgency or failing to prepare for (or respond to) critical events with appropriate speed and commitment, or (ii) deliberately amplifying and intensifying claims of urgency to bring about acquiescence to certain proposals (Owen et al. 2013). The latter might be done strategically in order to circumvent regulation (especially environmental requirements); argue in favor of unpopular technologies (such as ‘fracking’); or to limit democratic participation (by silencing or devaluing concerns and opposition).

Studies of organizational change have found that in the context of political decision-making, urgency can hinder long-term thinking in policy design and, when coupled with heightened fear, lead people to look for proximate rather than systemic causes for issues experienced in the present (Lianos 2015). MacKerron notes that urgent policy decisions have to be balanced against the need for legitimacy and consent, and overemphasizing urgency often disrupts the latter (MacKerron 2009). Issues in conflict scenarios considered in terms of risk, danger and urgency tend to provoke different policy responses to those couched in a discourse of rights and justice (Peters 2010). Considering these diverse contexts together, we see that urgency is diagnostic and entails ascribing relative degrees of value and importance to different elements of social life, which can result in institutional actors disregarding some concerns as ‘not mattering’ (Rosenberg et al. 2009). These are among the many justice implications that follow when different actors identify, reject or accept conditions of urgency and alter their actions accordingly.

Developing this focus on urgency and combining energy justice with other social science approaches speaks directly to issues surrounding procedural justice, understood as meaningful participation within equitable and fair institutional processes and inclusive involvement in democratic or participatory decision-making procedures (Young 1990, Schlosberg 2007).

Scholars of public participation in technology and development governance highlight a need to replace urgency-based claims made by governments and other actors – claims made in support of the rapid unimpeded implementation of technology development – with approaches that are more socially responsible and responsive (Stilgoe 2013, Guston 2014). The argument here is that meaningful processes of deliberation and reflection require time to be completed and form an integrated, iterative component within innovation processes (Stilgoe 2013), and that public participation through deliberative fora is a core strategy for achieving these goals and thus working to achieve procedural justice (Parkhill et al. 2013). Building on previous successful deliberative research (Harthorn et al. 2012a), we held public deliberation workshops in the US and UK.

3. Methods

Our team designed and facilitated four daylong deliberation workshops to engage diverse publics on the meanings and consequences of future shale extraction. Workshops included a presentation on the technical processes involved in extracting oil and gas from shale rock using hydraulic fracturing and also informational materials that we designed in consultation with a panel of topical experts in both countries (Partridge et al. 2017). A total of 55 people participated in our workshops held in Los Angeles and Santa Barbara in the US, and in London and Cardiff in the UK. These sites were selected as comparable pairs of cities in each country (one major city population hub; one smaller, regional city) located in ‘pre-impact’ areas that have not yet seen extensive shale extraction via deep-drilled horizontal wells as seen in parts of the US where the shale industry is already established. Our US sites are pre-impact since well-stimulation techniques already in use in California occur primarily in established oilfields away from coastal regions and to date have been used to access oil reservoirs not located in shale (CCST 2015).

The deliberative workshop format was based on several previous sets of workshops on other emergent technologies (Harthorn et al. 2012a, Corner et al. 2013, Parkhill et al. 2013). The deliberative research context, in contrast to survey-based processes and findings, constitutes a unique setting for examining both shifting and conflicting individual risk and benefit perceptions

(Macnaghten 2017) and the articulation of public attitudes about technology in society in dialogue with others from diverse backgrounds. We suggest that such deliberative contexts offer productive modes of inquiry for examining the different ways that urgency figures in or is absent from participants' accounts of emergent technologies including 'fracking,' and how this relates to respondents' subjectivity, sense of responsibility and ambivalence, and other ethical and societal concerns.

Two factors in particular make shale development an atypical case for deliberation: variation in stages of development across the US and UK; and the existence of scientific and media accounts of already-witnessed impacts. Shale development is thus a 'liminal' case for deliberation, engaging both topics of discussion typically considered downstream or post-impact (such as localized issues of hazard and safety) and those associated with pre-impact or upstream locations (national-level concerns and questions of ethics) (Partridge et al. 2017, Thomas et al. 2017a).

The protocol used across all sites – with minor adjustments made to provide locally relevant contextual information, e.g. matters of energy regulation and planning processes – followed a similar format to previous nanotechnology deliberative workshops (Pidgeon et al. 2009, Harthorn et al. 2012a). Workshops involved a series of tasks, facilitated discussions, information sharing and open-ended conversations designed to address key issues associated with shale development, and to enable participants and groups to discuss these issues in their own terms (Partridge et al. 2017). 'Quasi-representative' groups of people were recruited in each city aiming to match local demographics as closely as possible with regard to age, income, educational, occupational, and ethnicity, balanced gender, and drawn from different parts of the cities. Recruitment of participants took place through neutral third parties and was 'topic blind' – participants were invited to a workshop to discuss 'technology and society.'

Full audio and video recordings of the workshops were made with participants' consent. We hired professional transcription services to generate texts of all discussions that were then anonymized, coded and analyzed thematically: research team members systematically reviewed reflections and points of comparison in collaborative conversations between research sites. Subsequent rounds of reading and coding enabled us to explore key themes that emerged in the

data, including a wide range of concerns and ideas linked to risk and benefit perception, energy and society, inequality and governance. Here, we focus on diverse views on urgency and justice as they appear in discussions on shale oil and gas extraction and associated risk concerns.

4. Results

4.1 Energy supplies and drivers of urgency

In all four workshops, participants acknowledged the importance of maintaining ready access to energy, noting both the urgency of – and governmental responsibility for – ensuring energy supplies are not disrupted. For Eric in Los Angeles, this was an issue of “*national security*” since “*without energy, none of our systems work. Our traffic grinds to a halt. Airplanes start falling, crashing, or whatever*” (Eric, LA). Some participants in the UK felt that the critical importance of maintaining energy supplies could motivate the early adoption of shale development. In London, Tony described governmental moves to extend the number and geographical range of Petroleum Exploration Development Licenses in the UK in terms of ‘time pressure’: “*for those charged with making that decision... The time pressure is acute already... We’re behind the curve.*” In the same workshop, Paul echoed this sentiment, suggesting that the UK delaying to scale up shale extraction meant that as a nation “*we’re already late to the table on this. We’re late to the party.*” During a discussion on the contested climate change implications of shale development, Tony again referred to a sense of time pressure driving energy policies, though this time also noting how short-term solutions can lead to greater overall costs in the long-term: “*I think there is a real issue around energy security, which is coming. And if we delay too long, then the pressure to do short term things with even greater costs [is] likely to increase*” (Tony, London).

In Santa Barbara, Ron recognized that increased extraction of fossil fuels represented “*a temporary solution to our energy needs*” at a time when technologies associated with non-carbon based energy sources, such as hydrogen-based electricity generation, are still in developmental stages. However, he added that in the short-term this created a need to press ahead with shale development wherever it was viable, particularly as a result of competition on the international

stage: *“in the meantime, we have to stay competitive with the rest of the world”* (Ron, Santa Barbara). In the same workshop, Saul suggested that the presence of fossil fuels now made accessible and economically viable brought with it an obligation to use them, in order to promote domestic US oil and gas production: *“are we going to, you know, tap into our own resources [like] Mexico is doing right now? ...They’re starting to come up because they’re utilizing their oil industry and all the oil they have”* (Saul, Santa Barbara). Ron concluded that the importance of energy supplies and maintaining a competitive lead meant that even polluting energy options should be pursued, despite the consequences and even if it requires sacrifice:

“sometimes we have to think beyond our own personal interests and think [about] national security, our energy needs... [fracking] is going to have impacts. It’s going to [have] negative impacts. Even if I’m for it, I’ve got to realize there’s negative impacts to it, but sometimes we have to think beyond our own self-interests, our own little community and what’s of interest to the nation as a whole, because we have to compete in the world” (Ron, Santa Barbara).

Energy security concerns were not the only way in which participants described time-related pressures acting on governments to expand shale extraction. Joe in Cardiff made two related points concerning contested energy timeframes and shale development, noting: (i) tensions between waiting to gather more evidence regarding the relative safety of shale extraction in Europe before scaling up production; (ii) added urgency or impetus in favor of shale development resulting from potential competition with other shale resource producing nations:

Joe: *“One, we already know what it’s like because they’ve been doing it in the States for ages. There’s no point watching to see what it’s like in Europe because it’s [the] same process. And two, if we do wait until the European countries do it, and then think, oh wait a second, we want to do it, we’re very far behind them.*

Laurel: *We’re going to miss out then.*

Joe: *They will have cornered the shale gas markets and we’ll all just be playing catch up. So if it’s something which we do decide we want to do, then we want to get in on the ground floor or not do it at all.”*

Such views highlight a potential driver of urgency: a preference for dealing with “known” hazards and dangers could justify adopting sub-optimal or destructive proposals in immediate or short-term timeframes. This exchange also draws attention to how a sense of competition – and concomitant need to act quickly in order to beat competitors – might drive both urgency in energy policy decision-making and add to public support for controversial measures such as shale development, a view we also encountered among a small number of participants in the US.

4.2 Urgency, framing, and climate change

Despite some acknowledgement of the above ‘drivers’ of urgency, the more widespread position articulated across our groups was concern that focusing on short-term objectives, especially those achieved through the rapid expansion of new technologies, may create greater costs overall. Participants in each of our research locations offered critiques of how the case for shale development has been made; a common theme was perceived short-termism (Partridge et al. 2017). With reference to changes to energy systems, short-termism is reflected in energy policies that prioritize immediate interests over potentially harmful long-term impacts as when short-term profitability is valorized over the need to address hazards associated with increased air/water pollution and greenhouse gas emissions (Nixon 2011, Groves 2014). In Santa Barbara, Ray offered one such critique:

Ray: *“when I look at things like money and economy and jobs, those are low on my list.*

Joel: *Yeah.*

Ray: *So for me, I look at what it costs last. I look at the effects first, long-term effects. I’d rather pay more now, and solve a problem, than tell my grandchildren, ‘You have to take this problem because we didn’t want to deal with it. You solve it.’”*

Jess in Cardiff similarly felt that “*quick fix*” responses to urgent issues such as energy security were unsatisfactory, a point that met with some agreement, e.g.: *“the environment [is] going to be hit detrimentally. So what’s the point of just having this short-term solution? [In] the long term we’re not going to get the gains, we’re going to be in a worse position”* (Karen, Cardiff). Policies with apparently short-term objectives were seen as problematic both because they may

create immediate negative impacts and because they may fail to address underlying systemic issues – treating symptoms rather than causes:

“the short term generally leads to more damage... in everything we see. So whenever something’s fixed short term, I can’t help but feel it’s just a patch on an already broken thing... The general problem is still there... [we] all understand that there’s climate change issues... So what’s our solution? It’s short-term fixes, and [it] leaves the main problem... [the] lack of focus is because we want to see results quickly” (Andrew, London).

In a later discussion in the same workshop on whether resources that have been identified and are accessible should be used, similar issues emerged regarding the longer-term economic and environmental costs of prioritizing short term objectives: *“[there’s] this need to have something now and not look at the long term”* (Ellen, London). Nadia responded by highlighting the ‘false economy’ of urgently enacted measures:

“if we looked, and politicians especially, if they looked at things in the long term properly... then they wouldn’t constantly need [all] these short term quick fixes, which need more money and more time and more expertise, which just constantly crop up... if you [plan] how you’re going to make things sustainable, renewable, environmentally friendly, as well as cost effective in the long run, then... you could save yourself time, money and effort” (Nadia, London).

Another critique of urgency claims emerged in discussions on climate change: a widely-shared view was that shale development would exacerbate climate change both by contributing to the extraction and use of fossil fuels, and by proceeding at the opportunity cost of renewable technology research and investment, consequently narrowing the range of available energy alternatives and minimizing the impact of individual mitigation efforts (Partridge et al. 2017). Challenging arguments that promote shale gas as a lower-emissions energy source compared to coal, energy system changes to address climate change were identified as being both urgent and far-reaching. Thus, contrary to those who felt urgent needs such as energy security justified the implementation of sub-optimal measures in the short term, urgency-claims made in support of more polluting energy choices were disputed: *“I’m not sure that I buy the arguments that... replacing coal emissions with gas emissions is actually going to solve the greenhouse gas*

problem... wouldn't it [be] much better [to] change to other technologies that are not producing greenhouse gases?" (Laurel, Cardiff). Laurel also drew attention to the urgency of reducing global greenhouse gas emissions: *"if you add up the numbers, are we reducing coal enough, are we replacing enough coal with enough gas to actually have an impact by the time we need it?"* Andrew in London made a similar point – that measures to reduce emissions were being implemented too slowly: *"Lower emissions is great but it's already too slow and it's already passed the point where it's something we should be thinking of."*

Many participants articulated the need for more forward-looking, anticipatory policies, for example describing contemporary crises of environmental degradation and depletion of conventional oil reserves in terms of path dependence and over-consumption: *"we've known this was coming since the first cars were rolling down the roads"* (Miriam, Santa Barbara). In calling for anticipatory policy measures, participants questioned urgency-claims – including those that support shale development as a means to meet current and growing levels of energy demand – and rejected proposals seen as paying insufficient attention to longer-term outcomes. Such assessments of competing energy initiatives articulate moral choices about different energy futures and complex questions of ethics and (in)justice (Wynne 2005, Demski et al. 2015). Importantly, a number of participants suggested that desirable (in this case, renewable) energy initiatives should also be implemented with caution rather than urgency:

"in an [ideal] world... I would say, renewables, they're great... but it's not going to happen quickly... [fossil fuels are] what we use, that's what the infrastructure's built for. We can't just stop using it – we would have no energy... so I think [we] need to slowly rely on those less – slowly build up the others more... [they're] pushing through shale gas really quickly. I don't think the alternatives should be pushed through really quickly either, even if it's something I agree with... I think nothing will work if we push it too quickly" (Lois, London).

4.3 Urgency and inequality

Issues of inequality also emerged in discussion of urgency claims. Most participants felt they would not have access to any projected economic benefits of increased oil and gas extraction. Explicit policy support for shale development in the UK was described as a *"dash for cash"*

where “*people are being asked to [give] up land rights, [give] up existing rights for corporate profit*” (Paul, London). Paul also made a point that people in the room agreed with – that the speed with which UK politicians were issuing extraction licenses was a concern, and that a slower pace of development with time to include more ‘independent’ assessments was required: “*[it] feels like a rush to licensing, you know... there is some kind of a push for a very large number [of] companies to benefit. And that comes back to the cynicism and the concern. And perhaps just needing to see... a little bit of slamming on the brakes of that licensing, whilst they independently assess the viability*” (Paul, London). In Los Angeles, the main beneficiaries of increased shale extraction were seen to be ‘private corporations’ and their shareholders – groups that most participants in that city felt they were excluded from (Thomas et al. 2017a).

In these discussions, participants also drew attention to broader temporal concerns, particularly with reference to the uneven distribution of social and environmental impacts of shale extraction. Economic impacts were pitted against those that would lead to significant or irreversible changes (such as water contamination). Lois drew attention to such inequalities across different timescales and sectors of the wider population, indicating that a focus on immediate benefits was a “*selfish view*” if a proposal “*will benefit us now but then screw the future generations, or other countries, or even people in my country now, but who aren’t me*” (Lois, London). In the same conversation, such apparent disregard for potentially adverse effects on others who are distant temporally, geographically, or socially reflected historical patterns of exploitation – what was called “*a very colonial way of thinking*” (Andrew, London). The experience of many participants in Los Angeles stood out from the other three workshops: people in the room there felt much closer to the impacts. For example, Sally said that “*the less fortunate*” are “*most likely going to suffer*” and described prospective shale development as fitting an historical pattern of industrial developments affecting poor and marginalized communities most acutely.

Concerns about how hastening or shortening energy decision-making processes might affect public participation were raised a number of times, particularly in the UK, along with potentially negative effects on efficacy within and exclusion from those processes: “*what strikes me [with] fracking and with [the] way we gain our energy, is that the lay person or the normal constituent has no say in it really... these are massive decisions that affect all of us, especially our children.*”

We're ruining [the] world for our children and we don't get [a] say in it" (Bea, London). Joe in Cardiff similarly felt that *"the politicians are just pushing ahead with it, regardless of what the public says,"* while Paul in London acknowledged that public participation is often required by law for certain planning applications but may not have any significant effect because it happens too late in the development process when *"the decision is already done."* Discussion on these contested timeframes around public participation also questioned urgency and highlighted the need for more anticipatory approaches:

"They do these things before they are fully aware of the consequences... And then at the end, [you] get it hitting you back in the face... it's the same with [any] new thing that comes up... we are the ones who are going to be suffering the consequences... so we should have more of a say in anything that goes on but we don't, do we? We're told afterwards and it's all passed through under wraps and we're told at a later date... I think we should be made more aware of what's going on [and] have more input" (Heather, Cardiff).

Another way in which urgency, or short-termism, might exacerbate rather than reduce inequalities emerged in relation to the issue of intergenerational justice, e.g., *"I feel bad. I feel like we're kind of screwing up collectively the world for the next generation of kids"* (Joel, Santa Barbara); *"I'm concerned about the environment, what we're doing to our planet... there are certain things that you just have to do to survive. But at the same time, it's very tormenting and very complicated... you think about your children. You wonder what their life is going to be like"* (Kim, Santa Barbara); *"we're not just concerned about our wallet. We're concerned for our kids and other generations"* (Sally, Los Angeles). We also heard concerns that consuming finite supplies of fossil fuels both reflected poorly on humans' collective abilities to care for planet Earth and even put human existence at risk in the longer term future: *"we have not been very good stewards of how we use [our resources]"* (Joyce, Santa Barbara); *"does humanity only intend to survive for another thousand years?"* (Bea, London). The *speed* with which fossil fuels are currently being used up was also highlighted as contributing to intergenerational inequality. In this sense, fossil fuels were seen as both polluting and precious – burning them inflicts environmental harm on others while the time taken for them to form is not reflected in the haste to find and consume more:

“we can’t take everything right now just because [it’s] what we need... It’s going to make us have no more air to breathe, which would be bad... this took millions of years to occur... and in 15, 25, 150 years we should just like take it all? And then what?”

(Miriam, Santa Barbara).

Taken together, these views reflect widespread rejection of actions and urgency claims that overlook marginalized populations or distant others. Such claims were also rejected when they were seen as perpetuating the unequal burdening of social and environmental costs from today’s energy practices – both as a threat to future generations and to those who are already enduring or are likely to endure the consequences of unconventional fossil fuel extraction.

5. Discussion and Conclusions

The diverse views that we have documented among participants in the United States and United Kingdom on urgency and prospective shale extraction reflect critical questions for energy justice. Our deliberative method was designed to recognize and respond to the complexities and abilities of individuals as acting subjects who test competing narratives against culturally established criteria of value, virtue and reasoning; grapple with ambivalence in responding to cognitive and social conflicts; and articulate moral choices about the purposes and future of technological developments (Jasanoff 2005). Such a design challenges the assumption that public concerns are limited to “instrumental consequences” rather than also crucially attentive to broader questions of ethics and value that are driving sciences and innovation (Wynne 2005). We might, then, expect the deliberative context to support discussion of justice concerns since it provides space for participants to explore in more detail issues that have been identified in other studies of attitudes toward emergent technologies such as fairness, equality and scrutiny of those who stand to benefit most (Satterfield et al. 2012). Still, our findings show that participants not only explored such questions in assessments of shale development and other energy initiatives but did so with reference to temporality and urgency, raising justice concerns across intersecting issues of distribution and the creation of environmental inequalities, process and procedure, recognition, and empowerment.

Participants in both countries recognized various energy-related issues as being urgent, including meeting energy demand, sustaining a competitive economy, reducing environmental pollution, and addressing climate change. At the same time, participants assessed governmental and institutional responses to these conditions of urgency with a critical eye. In some cases, this meant they saw governments as acting with insufficient urgency, as reflected in participant rejections of decisions that defer conservation or climate change mitigation efforts while maintaining the ‘energy status quo’ (Strauss et al. 2013). Conversely, participants also expressed concern about a perceived lack of precaution in the governance of shale development and other energy initiatives. Here, calls for more anticipatory approaches emerged out of widespread criticism of ‘*quick fix*’ solutions that address urgent energy-related issues but do so with apparently insufficient regard for their longer-term and justice-related implications (for example increased ecological damage or widening socio-environmental inequalities).

We encountered widespread resistance to issue framings that make urgency-based claims in support of their objectives – particularly when people felt certain energy proposals were presented as unequivocally necessary or inevitable – that is, when people feel they are being presented with ‘energy imperatives.’ These findings parallel STS scholarship that argues a single technological application is rarely found to be uniquely necessary, and such imperatives may be constructed deliberately to negate consideration of alternative forms of development (Stirling 2010). Relative levels of trust in governments and other powerful actors were also questioned in relation to the idea of ‘known’ hazards. Special interest groups can work to highlight disputed research results as inconclusive and misrepresent uncertainty in order to disrupt urgent public interest in regulation, as has been seen in relation to climate change through industry-funded research designed to ‘manufacture uncertainty’ to slow down or undermine the basis for regulatory intervention and to generate complacency among the public (Michaels 2008). Conversely, for individual risk perception, higher levels of uncertainty can lead to greater fear when people feel that they lack comprehensive information, or do not understand the information available, or if potential risks and outcomes are invisible (Slovic 2000). In our findings, concern for the justice implications of energy systems change were generally heightened when conditions

of urgency meant fewer opportunities to find out about, or be consulted on, new energy proposals.

Regarding distributive and intergenerational justice, in all workshops (and across all age groups) we encountered concern for younger people and future generations facing the negative consequences of contemporary energy practices – articulated both in terms of environmental damage and resource scarcity, prompting reflection on how *quickly* fossil fuels are being consumed. Some participants in the US articulated these concerns with specific reference to anxiety or “*torment*” about “*screwing up the world.*” Building on the work of Parfit (1983), theorists have addressed the moral basis of acting differently now out of consideration for future generations, weighing opportunity costs, probability of harms and different generations’ ability to handle them, and considering ‘long-range effects’ of contemporary actions both spatially and temporally. As Groves points out, present and future people are not primarily related as consumers competing over “how to share a fixed set of resources”: thinking about “future-oriented responsibilities” is characterized by uncertainty since determining how risks and resources are to be distributed fairly across generations requires knowledge that is simply not available (Groves 2014, p. 90). However, our participants had misgivings about excessive consumption of finite fossil fuels in the immediate timeframe even when faced with related uncertainties (e.g. the possibility of finding more fossil fuels or developing more efficient modes of use). At issue were both the already witnessed polluting effects of fossil fuel consumption *and* the inequitable time imbalance seen as disadvantaging future generations between ‘*taking everything right now*’ and the aeonic, geological timescales of fossil fuel formation.

Around climate change, energy justice scholarship has engaged with calls from climate justice movements to scrutinize global wealth distribution, international governance structures, and the under-representation of historically marginalized populations (McCauley et al. 2016). That work also identifies how global distribution of impacts of climate change, vulnerabilities to those impacts, and the burden of climate change mitigation efforts is socially, spatially, and temporally uneven (Bickerstaff et al. 2013). As the above intergenerational justice concerns suggest, many of our participants acknowledged such global inequalities *and* critiqued institutional responses to them, both for acting with insufficient urgency and for supporting misguided or unconvincing

proposals (“*lowering emissions is already too slow*” [Andrew, London]). Such calls for urgent changes to energy systems to prioritize the well-being of future generations over short-term economic gain also raise justice concerns when the proximate understood more broadly (whether economically, socially, geographically, or temporally) is prioritized at the expense of the distant. Survey research on UK public perceptions of energy security and climate change has found levels of concern are higher when geographical, social and temporal dimensions of psychological distance are reduced, for example when risks are presented as immediate (Spence et al. 2012). However, across our pre-impact research sites, participants articulated a global outlook and typically adopted what has been described as a ‘cosmopolitan’ view on energy justice (Sovacool et al. 2014). This involved identifying how current energy practices impact negatively on people “who aren’t me” whether that difference is spatial, temporal or cultural.

Risk research has found proximity to hazard combined with urgent perceived economic benefit or need can produce worker risk attenuation (Nelkin and Brown 1984, Harthorn 2003). Similarly, our participants discussed how justice implications of urgency and energy system change vary across and within different sectors of the population (marked by gender, race/ethnicity, and class, among other social locational positions). In Los Angeles, participants themselves felt “closer” to projected negative impacts – both geographically (negative polluting impacts seen as likely to directly affect their homes and communities) and temporally (any negative effects are expected to have an impact immediately). Also in Los Angeles, as well as in London, we encountered the view that those most likely to benefit from increased shale extraction would be *corporations* rather than members of the general public – inequalities in the distribution of benefits that have been documented on the ground in parts of the US where shale extraction is in operation at scale, and where even residents located close to shale gas wells may not receive significant income benefits (Clough and Bell 2016).

In our discussions on proximity and inequality, participants described the urgency of injustice itself. Energy justice was seen as less a function of better design and closer adherence to ideal principles to create more just energy systems in the future. Rather, participant views reflected literature and activism associated with movements for global justice and climate justice, articulating an immediate need to identify extant systemic injustices and to address the

“interlocking systems of inequality” that produce them (Pellow 2000). Such views also reflect calls within energy justice scholarship to address specific social, spatial and environmental justice conflicts within broader efforts to achieve equity and sustainability (Jenkins et al. 2014, Meng 2018). The views documented above suggest that many of the already-witnessed harms associated with contemporary energy practices would likely be exacerbated as a result of increased oil and gas extraction from shale. As emphasized in the London workshop, any energy initiatives proposed or implemented under conditions of urgency were at risk of repeating past mistakes and being blind to their long-term implications: *‘nothing will work if we push it too quickly.’*

In both countries, when public engagement was discussed, people felt there should be more, and more meaningful, opportunities for citizens to have *‘their say.’* However, expectations in Los Angeles that city residents themselves were likely to experience hardships as a result of expanded shale extraction point to differences across our workshops in views on distributive, procedural and recognition justice, both between cities (this view was more widespread in Los Angeles than in Santa Barbara, echoing different social histories of exposure to risk and feelings of vulnerability) and between countries. The US and UK have different national histories of deliberation and public engagement (Jasanoff 2005, Pidgeon et al. 2009). Reflecting this, we found subtle differences in the claims participants made. In the UK, more people spoke out directly about how public participation could be improved: that public voices should have input into policy-making decisions at an *earlier* stage and that consultation processes should pay more attention to calls for *precaution*. In the US, the emphasis was slightly different: we heard more about how the interests of corporations and wealthy people (shareholders) were particularly influential in decision-making processes, and also about the need for citizens to be *‘better informed’* and the difficulty of finding reliable or *‘unbiased’* information.

Such differences between the two countries also reflect different empowerment needs (for more education and participation opportunities in the US, and for more efficacy within extant participation processes in the UK) and acute awareness in our US workshops of how socio-economic inequalities affect procedural and recognition justice: the undue influence and over-representation of privileged voices and also barriers to participation faced by those currently

enduring and most likely to endure the ill effects of increased fossil fuel extraction. There are parallels here to divergence in national policy and approaches to technology governance between product-based risk assessments in the US and process-based, more precautionary measures in the UK and EU countries (Jasanoff 2005). Precautionary approaches to technology and development governance argue that, in case of doubt, judgment should support environment protection and human health, with direct implications for which technological initiatives are pursued or abandoned (Stirling 2007). Participants in our UK workshops demonstrated more familiarity with these approaches than US participants, as well as greater awareness of procedural rights for public participation in science and energy policy decision-making.

In both countries, participants were skeptical about institutional appeals to urgency in support of particular forms of energy and technological development. As science and society scholars have noted, such appeals on the part of policymakers, technology developers, and industry work directly or indirectly to minimize the role of reflection and response to public values in decision-making on the speed and direction of technological development (Macnaghten and Chilvers 2014). Claims made with reference to urgency are thus in tension with approaches that engage social values and are equipped to assess both the consequences and aims of technology (Stilgoe 2013, Guston 2014). Against such urgency claims, and in support of more precautionary approaches, participants in both the UK and US called for tempering of urgency appeals seeking more time for authorities and scientists to investigate the consequences of new energy initiatives and more opportunity to have their voices heard in policy decision processes. Contrary to survey research findings that identified a stronger general sense of technological optimism in the United States than the United Kingdom and Europe (Gaskell et al. 2005), here we see that similar concerns about urgency claims made by government and industry emerged with definition in both countries.

A critical task for energy justice work – in addition to identifying procedural injustices, the need for improved access to reliable information, and better processes of establishing consent and meaningful consultation for energy projects (Sovacool et al. 2014) – is to assess and engage strategies for achieving these objectives. Research in STS, risk, and Responsible Innovation have called for participation that is ‘upstream’ (before projects are underway thus enabling alternative

development strategies to be developed) as well as deliberative, responsive, and anticipatory (able to effectively hear and respond to public ideas before any crises emerge) (Wilsdon and Willis 2004, Pidgeon et al. 2009, Owen et al. 2013). The analytical and practical quest here is mutually reinforcing, bringing together tested strategies of upstream participation for improving procedural justice, and utilizing insights from energy justice work and elsewhere that highlights the importance of recognition justice while also, ideally, tackling how and why unequal barriers to participation exist within societies. Participation concerns, particularly in the UK, drew attention to current consultation processes happening ‘*too late*’ and not having decision-making influence. More generally, as we have seen, urgency tends to reinforce the status quo, effectively perpetuating extant social barriers and exacerbating rather than reducing socio-economic inequalities. Conditions and claims of urgency around energy projects can thus be further analyzed by assessing the impact of such claims on procedural and recognition justice.

Rather than urgency claims serving to attenuate potential concerns about issues of safety or ethics in this case, such claims for most of our participants instead led to increased suspicion or amplified concern that energy initiatives might be implemented before their impacts were fully understood. At the same time, however, in considering energy proposals, a number of participants acknowledged that urgent political or economic needs might constitute a reasonable trade-off against potential negative social or environmental impacts. While our study is limited to exploring views on shale development, energy transitions, and their contexts in the United States and United Kingdom, based on our analyses of urgency in energy justice and building on our own research on societal implications of energy and emergent technologies (Pidgeon et al. 2009), we encourage examination across disciplines of urgency as a concept. This would include investigating how claims of urgency both implicit and explicit, and their reception or opposition, vary across social and geographical locations; identifying instances of urgency being expressed, promoted or resisted; and a systematic investigation of links between urgency and risk perception, particularly when short-term concerns, needs and views are in tension (both socially and individually) with longer-term concerns.

Contested energy timeframes present critical questions for energy research, particularly with respect to issues of justice, inequality, and scrutiny of whose needs and priorities urgency claims

are seen as addressing and representing. We argue that a focus on urgency provides fresh perspectives on justice concerns surrounding the speed and direction of technological development in general and of energy transitions in particular. The hope here is to expand the role of energy research in developing insights into new links between contested temporality, energy transition, risk perception, and public engagement with science and technology and energy decision-making.

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