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The map is not the territory: A sympathetic critique of energy research's spatial turn

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ABSTRACT

Energy research in the social sciences has embarked on a 'spatial adventure' (Castán Broto and Baker, 2017). Those setting out on this journey have started from different disciplinary and theoretical locations, yet a "map" of sorts has begun to emerge. Made up of epistemological positions, conceptual vantage points and lines of enquiry, this map demarcates and structures the growing field of energy geography providing a more-or-less agreed guide to the territory. In the paper's first half I reflect on the scope and significance of the spatial turn in energy research. I describe the map now guiding much spatial research on energy, identifying core ideas around which spatially-sensitive social science energy research has come to cohere, notwithstanding its heterogeneity and internal diversity. I offer a supportive reading. In the second half, I offer a more critical reading of the adventure so far, arguing that it is unnecessarily limited in its reading of space. The full potential of a spatial perspective for social science research on energy has yet to be realised. I outline three pathways for realising some of this potential – geographies of knowledge production, differentiation and disassembly – and show how each takes energy research's spatial adventure in new directions.

1. Introduction

The transformation of energy systems in response to economic, political and environmental objectives can take multiple forms and raises a range of issues. The matter of *space* in relation to energy system transformation, however, now presses on academic and policy communities to a remarkable degree, and across a range of policy domains from energy security, climate change and infrastructure planning, to industrial strategy, economic competitiveness, foreign trade and international development. It is clear that, willed or otherwise, energy system transformation involves a reworking of many familiar and relatively durable 'energy geographies'. Illustrative examples include the proliferation of new energy landscapes associated with renewable electricity generation or unconventional fossil fuels; multi-scale geographical shifts in energy demand linked to a growing global-urban middle class; the reassertion of domestic fossil energy production by a number of national governments (e.g. Turkey, South Africa, Poland, UK, US) as a response to perceived vulnerabilities around security of supply; and accelerating cross-border flows of energy investment, including the build-up of major energy infrastructures (gas pipelines, electricity transmission

systems, shipping terminals) underpinning new patterns of energy trade.

As a consequence, it is no longer tenable for social science research to understand energy systems without some consideration of space. Indeed, social science energy research's "spatial adventure" [1] is well underway and, in the first half of the article, I reflect on the scope and significance of this spatial turn. I outline a shared appreciation for the spatialities of energy systems that has taken hold within social science energy research, and distill five commonly held ideas about space that run through this work. To give a name to this set of ideas and its role in guiding contemporary work, I refer to it as a map: made up of epistemological positions, conceptual vantage points and lines of enquiry, this map orientates and structures the growing field of energy geography providing a more-or-less agreed guide to the territory.¹ I offer a supportive reading that acknowledges the importance of these ideas in rendering visible a set of previously overlooked questions and claiming researchable territory.

The second half of the paper offers a more critical reading of the adventure so far. To capture the essence of this critique, I deploy the maxim in the paper's title – "the map is not the territory."²; I argue that social science's

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¹ There is now a substantial literature that offers a critique of cartography and its primary object (the map) as a mode of representation [2,3]. This work challenges the assumption, on which cartographic science depends, that a map is an objective representation [4]. Instead, it sees in maps (even the most apparently scientific kind) the workings of culture and the play of power. I do not take up this argument here.

² This phrase comes from Alfred Korzybski [5], a Polish-American mathematician and linguistic philosopher writing in the first half of the 20th century [5]. He sought to understand the process of abstraction through which reality is apprehended, represented and transmitted across space and time as part of the accretion of human knowledge and culture. The denial of identity ('it is not the territory') was central to his method for improving mutual understanding as it drew attention to the difference between representation and the object being represented. Korzybski's body of work on general semantics is not relevant here, but his maxim serves a useful purpose as it identifies and harnesses a gap (a non-equivalence) for the purposes of increasing understanding. I deploy his phrase in the spirit of a constructive metaphor, rather than a literal allusion to Korzybski's work on the relationship of representation to reality.

spatial adventure in energy research is sufficiently advanced that it has generated a map of sorts – a set of assumptions and perspectives that orientate current work – by which to understand the geographies of energy systems. However, we should not mistake this map for the territory itself: the territory is richer and more rewarding than suggested by the current map. I argue that further adventuring is both possible and necessary if the full possibilities of a spatial perspective are to be realized. I identify three lines of enquiry – geographies of knowledge production, differentiation, and disassembly – as pathways through which social science energy research's interest in space can be extended. These pathways not only generate new understandings about the significance of processes now shaping energy systems in important ways: they will also enable grounded and richly geographical accounts of energy system transformation to emerge, with the capacity to speak back to research in human geography on the spatial constitution of society.³

2. Energy research takes a spatial turn

Social science energy research that is spatially-sensitive and alive to geographical difference is not a new phenomenon (for discussion of earlier work see [8–11]). A previous generation of spatially-minded researchers also engaged with a world in which energy resources, markets and infrastructures were in a state of flux [12,13,16,17]. The development of national electricity transmission systems and centralized generating facilities in Europe in the 1960s, for example, attracted exploration of the changing geographies of electricity generation, transmission and distribution [14,15,18,19,20]. While some of this work fell into the long geographical tradition of descriptive regional studies, there were also efforts to systematically analyze and theorize (in the sense of developing general principles) the forces shaping energy economies and their broader social implications. Manners [13] *The Geography of Energy*, for example, forged a link between energy and spatial planning by teasing out key variables – transport, markets, political factors – influencing the spatial distribution of energy production, transmission and consumption in the UK, Europe and the United States. Similarly, transformation of the global oil market in the 1970s and subsequent policy focus on renewable, nuclear and coal-to-liquids technologies, propelled “an orgy of energy-related writing” that included accounts with a strong spatial sensibility [21, p. 572; see also 16,22]. For example, Odell's [17] classic *Oil and World Power*, which ran to eight editions, examined the role of oil companies, markets and resource-holders in shaping geopolitical relations during one of the most turbulent periods in the sector's history. This is not the place for a review: suffice it to say, however, that the differences between current work on the spatialities of energy and an earlier generation of spatial adventurers are fewer than we might find it convenient to think. There is an impulse evident in the ancestral record to understand a world in motion, and to inform and shape its unfolding future, that is familiar and which make it impossible to claim thinking about energy in spatial terms is original. It is stretching things, however, to suggest the record reveals a “three-decade history of energy geography as a coherent sub-discipline in the field”, as what came before is far patchier, and less unified, than such a characterization suggests.

The significance of contemporary spatial adventures, then, rests not on the idea that energy and geography might be a borderland worthy of exploration. Rather it lies in the volume of research now being done

³ The briefest of encounters with post-colonial scholarship is sufficient to recognize that exploring and adventuring are problematic concepts, given their valorization by imperialist projects of territorial appropriation, the raced and gendered identities sustained through such endeavors, and the assumptions about ownership and prior occupation that frequently accompany such terms [6,7]. I am mindful, then, that these are politically and morally freighted terms. However, I have temporarily set aside such concerns in the context of a special issue that embraces ‘spatial adventures’ as its theme, for the sake of developing an argument about how we might more fully realize the analytical potential of a spatial perspective for energy research in social science.

and, more importantly, in the emergence of some shared (and quite specific) conceptual understandings that now frame work in this area.⁴ There are significant differences within contemporary spatially-sensitive research on energy to be sure, yet it is possible to identify a set of conceptual commitments that much of this work holds in common. Importantly, recent research goes considerably beyond the entry-level geographical argument, which is to acknowledge that infrastructures, technologies and policies have spatial outcomes. By contrast, it recognizes that space and place “do stuff” to energy systems, giving them shape and form in often profound ways. As a consequence, space and place complicate how social science has conventionally thought about energy systems. For example, thinking about space in the context of energy systems foregrounds questions about geographical difference and multiplicity; it highlights relations of position and connection; and draws attention to spatial configurations and scales of organization [24]. The combination of intensity of engagement with the geographies of energy and a widely (if not universally) shared conceptual position suggest we may be witnessing a “spatial turn” in social science energy research, of which this special issue is one manifestation.⁵ Such a turn is significant not because it acknowledges there is a spatial dimension to energy systems: that argument has been made for some time now, and it reduces space to a second-order explanation, with research documenting spatial variation and interpreting it as localised inflections of an underlying a-spatial essence (the economic rationality of market participants, the state's structural power, or ecological imperatives for systemic change). Rather, the significance of the contemporary spatial turn in social science energy research is that, for an increasing number of researchers, thinking about space opens up disruptive and generative research possibilities. That is, space is more than geographical variation and a source of ‘local color’. It matters, profoundly. Taking space seriously in social science energy research leads researchers to ask different questions about energy systems, and admits alternative sites, actors and practices as legitimate objects of research. In this way, thinking about space can bring into view the analytical limits (and social consequences) of more conventional frameworks that treat space as an unproblematic substrate on which technical, economic and/or political action unfolds.

The spatial turn in energy research finds expression in three broad contributions that are moving research on energy beyond a narrow focus on the geographical outcomes of energy production and consumption. First, there is an attentiveness to the way relationships between energy and society take different forms across time and space. Energy may be one of the Grand Challenges for the 21st century, but this challenge is not the same everywhere: it is made up of several distinct, although often inter-related, problems which find expression through different geographies (urban/rural, global North/global South, net energy exporter/importer). Here the interest in space has primarily been about acknowledging geographical forms of difference. But, by acknowledging spatial difference, space has also begun to fold back into the research process in interesting ways: it disrupts the process of question formulation, because where one is situated spatially makes a difference to the questions that need to be asked; and it illuminates the geographical particularity of assumptions about actors, institutions and processes embedded in theoretical frameworks and research methods.

⁴ An important enabling condition has been a convergence of interest in the spatiality of energy systems between geography (and other cognate social science fields) and energy studies [24]. Geography appropriated space and place as foundational concepts long ago. It holds no monopoly on these concepts, but the discipline has had time to develop a conceptual repertoire and theoretical language for thinking about spatial phenomena and their relation to social and environmental processes. For the energy studies community, an interest in energy's geographies highlights the spatial consequences of energy system transformation, but also recognizes space's disruptive effect on conventional methods of appraisal and policy formulation.

⁵ A “geographical turn” has been observed in transitions studies [25]; and a “spatial turn” in socio-technical research, noting its traditional neglect of “cities – and places in general”.

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