



Original research article

Shale gas governance in the United Kingdom and the United States: Opportunities for public participation and the implications for social justice

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ABSTRACT

Questions abound about the appropriate governance systems to manage the risks of unconventional oil and gas development, and the ability for citizens to engage and participate in those systems. In this paper, we map the development of shale gas governance in the US and UK; we highlight the contrasting systems of land ownership and mineral rights, compare the opportunities that these systems of governance present the general public to participate and become involved in shale gas decisions and consider the implications on issues of social justice.

We conclude that in both countries, that despite government and industry engagement rhetoric and associated processes, the publics' influence on shale gas decisions is perceived to be minimal or not at all. We argue that the implications of the observed institutional governance systems, with few opportunities for citizen influence, are developments which inherently lack social justice, procedural fairness, and ultimately, a social license to operate.

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1. Introduction

Shale gas energy policy and exploration in the UK is an area of emerging interest, for both academic researchers and policy makers. Scholars have asserted that despite the significance of technological considerations and challenges, the process of extraction and utilising unconventional oil and gas is not simply a technological issue [1]. Questions abound, however, about the appropriate governance systems to manage the risks of unconventional oil and gas development and the ability for citizens to engage and participate in those systems [2]. In the context of shale gas development and its associated, multidisciplinary risks, governance has been posited as “the most critical domain” to facilitate changes and improve the management of these risks [3]. Governance is a complex, multifarious notion. Sovacool and Cooper [4] refer to three interrelated meanings of governance, in the context of energy megaprojects:

1. Governance can refer to the internal operation and management of the megaproject itself, e.g. how well it is built and maintained.
2. Governance can refer to the economics and politics of the system, e.g. the coalitions of interest involved in supporting or opposing a megaproject.
3. Governance can refer to the interaction between the technology of a megaproject and the types of social organisation it creates, e.g. whether it is controlling or democratic.

We focus on the third of these and consider governance in the context of public participation and social justice, contributing to the evolving research on energy justice [4–7]. Evaluating where injustices occur within this context and what processes exist to remedy these [8] would seem a sensible definition of our approach to understanding energy justice. We consider how energy systems can or should be governed in a way that contributes towards a fair and just society through a US/UK comparison of shale gas developments.

The US shale energy industry is well-established, and has largely followed the existing procedures in relation to governance and public engagement practices set by the conventional oil and gas industry, with some additional regulatory actions. Fundamentally, the choice to explore and extract in the US setting is based on a private transaction between a landowner and an energy company. Despite some differences in property rights from state to state, the

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contract between the company and the owner of the sub-surface rights governs that transaction (as set out by state law). The rules by which that extraction (and production, transmission, and consumption of the energy source) take place is then governed by a series of federal, regional, state, and local regulations. This complex web makes public participation challenging, as there is no clear pathway for participation nor surety of influence giving rise to grassroots opposition from multiple organizations. The importance of governance systems on project success can be seen in other resource-based industries. Foster and Garduño [9] observe that in groundwater management, it is often not a “lack of knowledge about sustainable yield or pollution vulnerability of aquifers” (p. 317) that are responsible for failures, but inadequate arrangements surrounding governance.

The UK is only now beginning to explore the possibilities of how extensive shale gas reserves, if exploited, could impact on energy prices, job creation and communities. The infancy of the shale gas exploration process in the UK provides a contrast, described as ‘puzzling’ by Cairney et al. [10], to the ‘all out for shale’ position of the 2010–2015 Coalition government [11]. Underground mineral resources are owned by the Crown Estate in the UK, and the process of exploring and extracting these resources is governed by a system of national laws. The UK government has established the Office for Unconventional Gas and Oil (OUGO), and are proposing to simplify the planning process for deep drilling of shale gas, oil and geothermal energy sources with the 2014–2015 Infrastructure Bill. This appears to reflect the “significant development support” from the UK government as discussed by Hammond and O’Grady [12]. The authors suggest that this interest in-part is due to the potential ‘game changer’ benefits for the UK from extracting large quantities of shale gas, which the IEA have suggested could contribute towards a ‘Golden Age of Gas’ [13].

At the local level, engagement and participation are important to generate what is referred to in the extractive industries as “social license to operate” (SLO) – a social psychological phenomenon of implicit trust relationships to establish *legitimate* extraction activities with mutual industry and community backing [14]. Demuijnck and Festerling [15] observe that SLO is a critical element of perceived legitimacy, stating that “business enterprises invoke the “social license to operate” (SLO) to indicate that their activities are considered as legitimate in the eyes of society” (p. 675). It is also important for reasons of demonstrating societal support in industrial activities, or in mitigating obstructive opposition; Moffat and Zhang [16] note that SLO relates to “the ongoing acceptance and approval” (p. 61) of extractive developments by local and other stakeholders, and organisations such as the International Energy Agency [13] suggest that a SLO is required by shale gas operators (*in* [17]). We argue that sustainable and legitimate governance systems require long-term support, approval and acceptance from a variety of stakeholders, and that their meaningful participation in decision-making processes is an important part of achieving this.

In this paper, we examine the experiences of shale gas development in the US (broadly, and specifically in Pennsylvania) and the UK (broadly, and specifically in Lancashire). The comparison of these two settings provides insights into the differing governance systems and their potential for public participation. Following a review of the opportunities for participation in each county, we discuss the implications for social and energy justice with reference to our own community-led approach to participation [18]. We argue that this approach can achieve a form of legitimacy that allows communities to derive social priorities by a process of ‘community visioning’, thereby promoting an active role for members of the public in energy decisions; specifically in the dialogue between government, industry and local communities. We also discuss to what degree we can evidence procedural justice in shale gas decisions that advances a concept of fairness. This comprises

two elements; is the process fair, and is the outcome equitable. As Walker [19] notes, justice theory has moved beyond the distributional to emphasise the role of process and procedure. Justice claims often extend beyond the distribution of benefits and cite procedural and regulatory fairness, including the role of stakeholders in decision-making. In recent literature, Cotton [20] asserts that the achievement of fair outcomes, and therefore justice, is dependent on establishing process-based fairness, honesty, accountability and transparency.

2. Development of the shale gas industry in the US and UK

Geologists have known about the reserves contained within “unconventional” sources (low permeability shale and sandstone or coal seams) of natural gas for decades but did not have the technology to extract it economically. In the 1970s, a combination of factors – including industry concerns about declining natural gas production, and federal government concerns about the productivity of domestic energy sources in the wake of the energy crisis – led to a loose coalition of private and public entities that invested in developing the geological knowledge and technological capacity to extract natural gas from unconventional sources [21–23]. Three critical technologies emerged from these investments, and have been crucial to the recent growth in shale gas extraction: three-dimensional micro seismic imaging to map the underground formations; hydraulic fracturing to effectively release the natural gas from the pores in the rock; and horizontal drilling techniques to interface with a larger section of the shale layers. These technologies were proven successful in the Barnett shale in Texas, which was the first formation to move into commercial production in the early 2000s when Mitchell Energy developed an effective “slickwater” that maximized the output of natural gas for the investment in materials in the hydraulic fracturing process.

2.1. Development of shale gas industry in US

In the US, the technique of hydraulic fracturing has been widely employed to extract shale gas from areas such as the Barnett and Marcellus shale basins for over a decade, significantly changing the energy portfolio of the country and natural gas prices. The natural gas industry has grown over 20% in the past 5 years, with 146,000 new producing wells being established during the past 10 years, aided significantly by the expansion of the shale gas industry and the increased use of horizontal drilling and hydraulic fracturing techniques [24]. This has resulted in one of the largest surges in energy production in the country’s history [25].

Since the early 2000s, the techniques discussed above were adopted by other production companies, and led, in combination with a rapid rise in the price of natural gas, to the exploration of a series of shale plays across the US between 2003 and 2011 (i.e. Fayetteville, Woodford, Haynesville, Marcellus, and Eagle Ford) and concomitant growth in production. The US Energy Information Administration (EIA) projects that shale-based natural gas production will grow from 0.75 trillion cubic feet per year as recorded in 2005 (4.1% of all gas produced in the US) to 19.8 trillion cubic feet per year in 2040 (53% of all gas produced) [26].

Of the US plays, the Marcellus Shale is the largest in terms of acreage, wells, and production [22]. The first Marcellus well was initially developed in 2003 by Range Resources in Washington County, Pennsylvania [21]. Between 2004 and the end of 2015, 14,022 unconventional wells had been drilled in the Appalachian Basin, including Pennsylvania, Ohio, and West Virginia [27]. The majority of these (9590) had been drilled in Pennsylvania alone [28].

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