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Abstract

The rapid pace of change, uncertainty and social contest associated with emerging regulatory spaces create challenges for public servants. In particular, their capacity to act in the public interest may be constrained as contesting interests vie for influence in nascent regulatory environs. This chapter explores these issues and the potential for regulatory capture in the context of unconventional gas and its regulation. The rapid expansion of unconventional gas, such as shale and coal seam gas (CSG), has responded to growing global energy needs, but has brought with it debates on how it should be regulated. These debates include the environmental concerns that may be a consequence of unconventional gas exploration. To illustrate the potential for regulatory constraint and capture in this context, empirically-based case studies of regulators in Texas and Colorado in the USA and Queensland, Australia are relied on. The existing regulatory frameworks governing unconventional gas in each state are considered to enable a thorough examination of the landscape of which public servants and their regulatory agencies are a part. The chapter demonstrates that the speed at which unconventional gas exploration is taking place creates challenges for public servants and regulatory agencies, as

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laws may not be aligned to practice. The chapter draws on its findings to reflect on the specific regulatory practices that are needed to ensure the accountability and legitimacy of the public sector in such contested spaces, including reforming state regulatory systems and pursuing alternative governance pathways in which relationships between industry, government and society might be reconfigured.

Key words: Energy transitions; capture; unconventional gas

Introduction

Democratic systems of governance encourage, and enable, different sets of interests, different constituencies, to vie for political influence through processes that allow one or more set of interests to ‘capture’ government, albeit it within the context of safeguards, from one election to another. As George Stigler pointed out in 1971 in his classic paper ‘The Theory of Economic Regulation’, regulatory processes are a prize that different economic constituencies seek to harness for their own benefit. Capture, and contests over capture, are thus at the heart of the regulatory game. This is something that Stigler stated very clearly, and very bluntly, in the opening sentence of his paper: “The state – the machinery and power of the state – is a potential resource or threat to every industry in the society” (Stigler 1971, 3). This challenges the widespread idealistic view of regulation as standing above partisan politics to protect an untarnished public interest that, in Stigler’s words, is “deeply embedded in professional economic thought” (1971,17), and, we would add, in the thought of regulatory scholars more generally.

In the 21st century, this challenge is increasingly acute where public agencies are asked to respond to problems involving significant complexity and radical uncertainty (Cooke 2011). This includes global technology, energy, environmental, and security risks (e.g. terrorism) (WEF 2019), all of which increasingly defy fixed boundaries – temporal, spatial, and conceptual. In this ever-expanding “risk society” (Beck 1992), regulators are being called on to confront these new harmscapes (Berg and Shearing 2018) and are being forced to adapt (Zedner 2007; Holley et al 2018).

At the heart of these regulatory responses, and the contests surrounding them, are the regulators, the civil servants who are required to apply regulatory standards and the politicians who establish them through political processes – processes that differ across political

jurisdictions from the ‘democratic’ processes that are our focus in this chapter, to states that operate within other political arrangements and aspirations. Within democratic political systems, regulatory arrangements are, by definition, sites of contestation both at the political level and at the level of the civil servants. This chapter, through a focus on the regulation of energy and unconventional gas, explores a significant issue that has long been central to regulatory studies generally and an issue that has proved central to energy transition research – namely, issues of the contestation of interests and the influence these interests have on the nature and outcome of regulatory processes. In the course of this analysis we consider the implication of these contests of interests for public servants and the objective of achieving energy regulation that promotes the realization of a habitable planet (see Giridharadas 2018).

The chapter focuses on unconventional gas regulation because it has been a context where a key source of engagement, between interests that favor and those who question the value of the use of hydrocarbons, has been the regulatory environments, particularly state-based environments. These have emerged with the intention of managing the mining and distribution of hydrocarbons in ways that will limit the harms that can and have emerged from the many multifaceted risks associated with gas as an energy source. A crucial outcome for those who favor effective state regulation of gas mining, including that of unconventional gas deposits, has been, and remains, that this regulation will lead to the protection of crucial ecological ‘boundaries’, as well as other interlinked social concerns (Rockstrom et al. 2009; Kotzé 2017).

Various scholars have speculated on, and to a lesser extent examined, the risks of industry influence in energy regulation (see for example, Grubert 2018). These studies have demonstrated the extent to which political influence by dominant industry players, at both the level of political leaders and civil servants, can be, and is, a serious obstacle to developments that will further required energy transitions (Loorbach et al. 2017). For example, fossil fuel incumbents can slow or block changes in energy regimes, as well as negatively impacting sustainability of energy policy and implementation (Ashford and Hall 2018; Smith 2003). As this existing research makes clear the risks of industry dominance and influence varies considerably across contexts. What is also clear, however, is that, despite extensive variation across context, the truth of Stigler’s central claim about the extent to which industries have been able to utilize the regulatory resources of the state to advance their interests, and often simultaneously disadvantage competitors, has been consistently validated (Gunningham 2013).

In this chapter we draw upon three case studies of regulatory influence to explore the extent of state capture, and resistance to this, often by dedicated civil servants, by the unconventional gas industry. In the course of our analysis we offer insights with respect to the

potential use of states and state agents to further crucial environmental agendas intended to maintain the earth as a habitable terrain for existing life forms. We do so by exploring the risks of regulatory capture and possibilities for maintaining an environmentally sound regulatory agenda (Lockwood et al. 2017, 319). We interrogate these issues through examining the regulatory influence of the gas industry within two leading global unconventional gas producers, the United States and Australia. In both nations, energy regulation is primarily the responsibility of regional (state) governments and not with national or local government, notwithstanding some limited regulatory direction at local levels via, for example, planning directives (Kroepsch 2018, 470).

In what follows we focus on three large unconventional gas producing states, namely Texas and Colorado in the United States and Queensland in Australia. Our results are based on interviews with 45 public, private and non-government stakeholders. As we expected, on the basis of the findings of other regulatory scholars over many decades and across many jurisdictions, we found that our respondents perceived the regulatory rules and their implementation to regularly favor the interest of the gas industry over more environmentally-sound energy outcomes. We conclude by considering possible regulatory means for releveling the regulatory playing field.

Risks of capture in unconventional gas regulation

A multidimensional concept, with a long history (Stigler 1971), ‘capture’ recognizes the domination of the regulatory process by narrow, special interests for their own benefit and at the expense of more general public interests (Shapiro 2012). Although risks of capture can arguably arise from any special interest, including environmental interests (Tucker 1980), it is the dominance of regulated economic interests that has been offered consistently as an explanation for the failure of environmental regulatory policy-making and enforcement to safeguard environmental values. Indeed, for reasons that Stigler (1971) outlines in considerable detail, regulators are more likely to face focused pressure from concentrated economic interests (e.g. regulated industries) than the general public, or other interests, who are unable to effectively mobilize to protect broadly dispersed public goods, like environmental quality (Farber 1992). Implicit in this criticism is often the implication that public servants are not acting appropriately to realize broader public interest objectives – objectives that today are regarded by many as crucial to the survival of many life forms including humans (Wallace-Wells 2019).

There are few agreed metrics or measures of regulatory capture itself. Just because a policy or regulatory program is informed or supported by an industry group does not constitute capture or some wrongdoing per se – indeed the existence of special interest lobby groups is an established feature of contemporary democracies (Carter and Morgan 2018). This makes measuring regulatory capture quite difficult, and requires the arguably complex consideration of when regulation is intentionally moved away from the service of one goal (a broadly conceived public interest) toward another (a narrowly defined industry interest) (Carpenter and Moss 2014, 12). Similarly, identifying intent by industry to actively and knowingly push regulation away from the public interest is challenging (Carpenter and Moss 2014). For instance, industry may benefit from regulation because their actions are producing “shared value” (Porter and Kramer 2011).

Capture is, by definition, complex. Carpenter and Moss (2014) distinguish between strong capture (e.g. where the public would be better served by complete replacement of policy or an agency) and weak capture (e.g. where industry influence compromises the capacity of regulation to enhance the public interest, but the public is still being served by regulation, relative to the baseline of no regulation). Indeed, new models of regulation now invoke industry and non-government actors in partnerships, flexible rule-making, market-based instruments, voluntarism and self-regulation, partly in an effort to be effective, while being less burdensome on regulated entities (Drahos 2017).

Mindful of these complexities, our findings echo growing attention in the energy arena to issues of capture. The threat of climate change – realized through harms such as unprecedented cyclones, droughts and heatwaves – and the now firmly established linkages between these harms and the carbon emissions of contemporary economies, globally, has given rise to widespread, and increasingly urgent demands at multiple levels for a massive energy transition (George 2015). A route to such a transition that has drawn considerable interest and investment has been the use of arguably lower-carbon energy sources, such as natural gas, both conventional and unconventional (Kelly et al. 2015). As gas is a fossil fuel that draws upon similar infrastructures – machinery, investments, knowledge systems and so on – these fuels have been termed ‘bridging fuels’ as they provide a bridge from ‘dirty’ to ‘clean’ energy systems. One of the more prominent, yet contested, routes for facilitating such a conversion to clean energy involves the exploration of unconventional gas supplies such as shale gas and coal-bed methane/coal seam gas (CSG) – a development that has emerged as a global phenomenon (World Energy Council 2016).

Advocates of these developments have argued that reducing a reliance on traditional fossil fuels, like coal and oil, given the contexts of today's energy markets, requires shifting the mix of primary energy sources, rather than an abrupt transition, and that realizing this requires the use of hydrocarbons (IEA 2016). Within this context, the speedy transition to unconventional gas in recent decades – Smil (2015, 133) regards these developments as “perhaps the most remarkable, and consequential, expansion of resource extraction in modern history” – has seen it play an increasingly vital role in meeting human energy requirements. Apart from the obvious benefit of providing a relatively low-carbon hydrocarbon energy source to the energy mix that can reduce dependence on coal, there are many positive social and economic aspects to unconventional gas development, including infrastructure enhancements, job creation and investment, as well as supporting the public purse through royalties and tax revenue. Unsurprisingly, the transition to unconventional gas, notwithstanding its purported lower carbon status, has given rise to many concerns by advocates of a rapid shift to a low-carbon economy – including environmentalists – who contend that this simply delays an urgent transition and misunderstands the magnitude of the environmental crisis facing humanity and many other species. Their concerns include risks of air pollution, noise and amenity concerns, subsidence, changes in the use of food-producing land, water pollution, reduced water availability and high methane emissions.

There has been much criticism of state law and policy regimes for their failure to attend to linkages and interdependences between unconventional gas and its environmental and social impacts (Hussey et al 2015). Such criticism has led some to claim that laws and policies are enabling the unconventional gas industry to trump public and community interest, thereby undermining sustainable outcomes (Kennedy 2017). What remains unclear is when and how the unconventional gas industry may dominate or capture state regulatory programs. The broader literature on environmental regulation identifies a range of reasons for industry dominance, including a lack of political independence (particularly where lobbying from industry is high), an imbalance of expertise and information between industry and the regulator, suboptimal legal and organizational arrangements, poorly-funded organizations and revolving doors of staff between regulators and industry (Carter and Morgan 2018).

In the face of such risks, analysts have identified various means of resisting or reducing such capture, not least being representation by, and actions of, NGOs in regulatory processes (Thornton et al. 2008). Concepts, such as tripartism, in business regulation (Ayres and Braithwaite 1991) and countervailing powers have been used to describe the actions of NGOs, who use their knowledge, skills and position in regulatory decision-making, forums and public

sphere to reduce, and perhaps even neutralize, the power advantages of ordinarily powerful actors (Fung and Wright 2003). Nonetheless there remains a need for further empirical study of the risks, causes and solutions to regulatory capture in the distinctive structure and politics of energy and unconventional gas mining.

Our Findings

Perceptions of regulatory capture and industry dominance

Across Texas, Colorado and Queensland, regulation has long been applied to unconventional gas production. Although each state has a slightly different regulatory approach and organizational structure, regulations variously prescribe disclosure rules (Kourula et al. 2018).

Our respondents reported many strengths in their respective state's regulations. Broadly speaking, interviewees saw states, rather than federal governments, as better suited to regulating the gas industry, because it is complex, involves rapid technology developments and has largely localized impacts. As one national NGO respondent put it: "I still think that States are able to respond to change more quickly than the Federal government...it's better than a one-size-fits-all top-down regulatory structure". In relation to the state case studies, specifically, Colorado was often praised as having some of the earliest and best methane regulations, and its baseline water monitoring was praised for its forward-looking approach. In Queensland, improved cumulative modelling of groundwater impacts over time and ongoing enforcement and compliance programs were also considered to have increased regulatory effectiveness. Finally, some respondents in Texas noted its regulation was "about as mature as any state in the nation...and it's a pretty tight ship". Its disclosure rules were also said to have improved the ability for monitoring fracking activity, particularly among the bigger gas companies.

Many of our interviewees also noted the importance of gas production to the states' economies (see below) and its significance in providing orderly energy transitions. As one industry respondent put it: "In the medium-term gas is a fundamental enabler of wind and solar – because without base wind and solar can't cope with demands". These types of benefits led some respondents to reflect on the need for a regulatory environment that facilitated, rather than hampered, unconventional gas production. Notwithstanding such views, there were widely-held opinions that each state regulatory regime confronted a number of significant weaknesses.

This case was perhaps put most strongly by our interviewees in the case of Texas:

I would say that a lot of it has to do with agency capture by the industry, particularly in states like Texas where the industry has gotten what it wanted for years and years, very difficult to change that culture....Once you open the door to allowing industry to basically get what it wants, they're just going to take it, and they're going to take it at every step.

Others, such as legal and academic experts, noted how Texas' primary regulatory body, the Railroad Commission, was "being controlled by a government institution so heavily tilted towards the industry". As another respondent from an environmental group described it: "even though we know there are regular routine and sometimes flagrant violations of the law, they [the Commission] bend over backwards to try and suggest there are no environmental problems with fracking, the industry's doing just fine".

Similar sentiments were expressed by Colorado-based interviewees. As one law expert pointed out:

the state and the industry at every turn have fought off regulation...Now the state does have authority to go beyond their minimum requirements, they just almost never do or they do like very little ... And that has really led us to the point where now communities are just fed up, I mean the government is not protecting their interest, industry is fighting against regulation at every turn.

In Queensland, respondents held a spectrum of views. For example, one NGO-based respondent claimed that: "the regulation is rubbish. It's self-regulation". Other NGOs, however, while less critical, noted regulatory deficiencies arising because of the gas industry's privileged position as the primary information holder on the effects of extraction:

Government is entirely dependent on companies for a lot of information. The companies are the ones best positioned to do baseline studies. It is tricky for government to afford to do the research to get the information - they need industry, but once industry does it and gives the government the raw data, the company has already invested heaps of money, and so of course it tells the government that everything will be okay."

These views on (weak) capture and industry dominance varied between individual interviewees. For those who raised capture or industry dominance of regulation, it was clear there was significant respect for many public servants within regulatory agencies. Indeed, the integrity of staff was never questioned by our respondents. However, in each state it was recognized that these staff and the agencies themselves were significantly constrained by various barriers (e.g. underfunding and political control). What was evident from many of our interviewees was a perception that the regulatory system favored industry over a number of environmental and community concerns.

The causes of industry influence and risks of regulatory capture

Although explanations for industry influence varied, including political lobbying at the very top of the law-making system, the majority of respondents suggested that the vulnerability of state regulation to industry influence arose from a combination of economic arrangements, suboptimal organizational arrangements, an imbalance of expertise and information between industry and the regulator, poorly-funded state agencies, and revolving doors of staff between regulators and industry that shaped the sensibilities of regulators.

Economic arrangements

Respondents across all three cases raised concerns about unconventional gas and its role in broader economic arrangements within their states. In particular, they pointed to the historical legacy and structural features that favored industry interests over environmental ones. In both Texas and Colorado, respondents pointed to a history of laws being drafted to favor the industry. As one community representative expert noted, there has been: “a long-term legacy, since however many decades, of just the way the laws have been written, they were written by industry...So there is a bit of a capture that's probably historical in nature”.

Unsurprisingly, the major reasons industry held influence over regulations was the significant economic returns (also a notable factor in public interest) they provided. As one academic expert explained:

this isn't rocket science – if you curtail the industry or constrain the industry it will have a negative economic impact. So you would forego billions of dollars in oil and gas production and you would forego those jobs. You would forego the taxes. The way we tax the industry in Colorado it ends up summing – depending on the prices – ends up summing to between \$500 million and \$1 billion every year in taxes at the local level. So you're putting a lot of that value at risk.”

As another respondent explained:

One third of the economy of Texas is still oil and gas and that's worrisome. They have potential for renewables, solar and wind should work well and if you go to the Panhandle, there are a gazillion wind farms, but I - think it will take a political decision to really reduce the reliance of the state on oil and gas and that will not happen because...we don't pay state taxes, mostly because the state gets a lot of money from oil and gas, so we are too reliant on that to assume that fracking will go down. The Texas Legislature has been very good at preventing local regulation from differentiating themselves if they think that they are not business friendly.

As a result, respondents believed it was unlikely that anyone was able to put too much pressure on the gas industry. As one academic expert noted: “they pretty much can do whatever they want to do”

In Queensland, despite a comparatively younger history in unconventional gas extraction, respondents pointed to a similar tendency of laws to lean toward industry, in part because of the royalties the government receives from its development, the boost to the state economy and very good industry lobbying on both counts. However, as one government respondent note:

One of the things that happened, APIA and resources council were very good lobbies. The global financial crisis had hit. Government was struggling to balance budgets. The lobbies rolled in and said this will solve your problems. 170 million was the projection, but actual royalties were 34 million. Industry oversold royalties benefits and government swallowed it hook line and sinker.

Organizational Arrangements

Independence of a regulator is sometimes seen as a badge of honor, shielding operations from interference and influence by politics and industry power that can produce capture. Each of the three cases evidenced concerns over regulatory independence, albeit to varying degrees. On one end of the spectrum was Colorado, where reforms to the Colorado Oil & Gas Conservation Commission (COGCC) had shifted opinions of its operations from being “fully captured” to one that represented a more balanced mix of interests. Even so, the under-resourced nature of the COGCC led one NGO to claim its operations were ineffectual and thus served broader industry interests:

the Colorado Oil and Gas Commission...I think we have found it to be incredibly problematic in terms of oversight of the oil and gas industry, very similar to our politicians it feels very much like it's just another paid-for branch by the oil and gas industry...this regulatory arm, is not doing its due diligence when we have something like 28 regulators for the entire state for 55,000 active wells. I mean, it is absolutely absurd.

In the middle of the spectrum, Queensland's agencies were noted as lacking an “independent regulator”, with departments responsible for environmental protection and mines accountable to the same minister. Attempts in Queensland to create an independent dispute resolution body, the Queensland GasFields Commission, was (prior to legislative and organization reforms in 2017) also criticized as having been subject to regulatory capture by the unconventional gas industry and failing to adequately protect the interests of landholders (The Scientific Inquiry into Hydraulic Fracturing in the Northern Territory 2018). As one government respondent

claimed: “the GasFields commission – I call them WOFTMs – waste of flaming time and money. They went out and insulted landholders front and center. Creditability was zero”.

Finally, at the more extreme end, the primary regulator in Texas – the Railroad Commission – was widely seen as lacking independence. As one academic expert characterized this: “There is the rest of the universe and there is Texas oil and gas”. Moreover, the Railroad Commission’s organization structure was controlled by elected commissioners, who were allowed to raise money from a variety of sources, including “a lot of finance for campaigns from industry”. Even though respondents noted that “staff tend to be very good. Very talented. Very objective. Want to do the right thing” they noted the Railroad Commission was “widely criticized. A classic captive type regulatory entity”.

The problem of revolving doors

The term ‘revolving doors’ has been used to describe the movement of personnel between regulators and industry, and the subsequent conflicts of interest and influence that result from this movement (Gormley 1979). This was cited as a common phenomenon in Colorado and Queensland, although this was not expressly raised in Texas. For example, Colorado interviewees pointed to regulators “often” leaving to work for the industry or to be lawyers for the industry. As one anecdote explains:

the previous director (of a regulatory commission)...before he had publicly announced his resignation, his new lobbying firm was listing him on their website while he was still a government employee...So they don’t even bother to wait until after he’s no long a public employee to be touting his government ties and being able to help and advise clients. Another former director, is now kind of a prominent oil and gas lawyer...So it’s kind of the path as you go and you work for the regulator for a few years and then you go cash up by making a lot of money on the other side.

Similar stories were detailed in Queensland, with one farmer questioning the monitoring and management of the industry because of “the revolving door...whichever day it is they’ll be one or the other”. As one NGO respondent explained:

there's this cross-fertilisation that goes on...The industry plays both sides of politics. So, it doesn't matter who is in power; there is always someone on the inside track in government or close to government with really strong networks back into industry and they can get what they want. They’ve got a lot of money.

Imbalance of information, expertise and resources

As noted above, gas extraction processes and their rapid expansion through technology development (e.g. horizontal drilling) involves complexity and uncertainty for any regulator (Cooke 2011). As a consequence, regulators across all three states reportedly faced major challenges in gaining the information required to enable a proactive regulatory approach. As a lawyer from Colorado explained:

I think there are clearly agencies or components of agencies that suffer from capture more when they are dealing with things that no one understands except for the few highly regulated industrial actors.

Texas respondents made observations, with one academic expert noting that “the regulator is captured by the industry. And part of that is by virtue of the regulators needing to understand what the industry regulations should be”.

Respondents from Queensland, where regulation is much newer, noted even less experience and information amongst government agencies. The result, according to one government respondent, was that the regulators:

...didn't know what they were doing. They were doing catch-up all the time. It was a reactive policy, flexible, as things unfolded we said, 'oh shit we better do that'. The bureaucracy wasn't ready to deal with it. We didn't learn from the US experiences...we learned from first principles ourselves.

Compounding this challenge of information deficits was a general view that the agencies lacked sufficient funding for their work. As one Texas government and US NGO respondent put it: “Funding for regulatory programs is a perennial” and “the regulators are doing the best they can with the resources they have... I would say they are all under-resourced relative to the enormous work that they have to do. From the industry perspective, you know, they never really move fast enough.”

Addressing vulnerabilities and pathways forward

Although Texas, Queensland and Colorado have taken different regulatory approaches to unconventional gas, their regulatory systems have all courted controversy. As is clear from the interviews, unconventional gas regulation continues to confront criticisms of regulatory shortfalls. These included concerns over air and health impacts arising from the proximity of developments to urban populations and public places, and a failure to adequately account for

cumulative impacts on the environment. These findings echo concerns raised in the literature, and in the findings of some recent inquiries, about the regulation of unconventional gas (The Scientific Inquiry into Hydraulic Fracturing in the Northern Territory 2018).

Our findings identified a range of vulnerabilities in regulatory and institutional structures that have created (and in many cases have continued to create) opportunities for industry to influence state regulatory systems. Taking these vulnerabilities and concerns on face value, we ask: what can concerned stakeholders do to reduce such vulnerabilities and level out the playing field to provide additional protections for the environment and communities? While our study raises these questions in the context of unconventional gas regulation, they have relevance and application to other areas of regulatory concern.

At least two overlapping pathways appear available across the case studies, namely: reforming state regulatory systems and/or pursuing alternative governance pathways outside of state regulation. The first pathway, state regulatory reform, could involve numerous intervention points. One extreme and likely long-term reform would be to encourage direct federal regulation (or at minimum greater federal intervention) in unconventional gas regulation, particularly at a “constitutive regulation” level (Shearing 1993). Such changes would likely involve major political and policy hurdles. A medium-term option may be to build further support and traction for existing or current countervailing powers, such as environmental and conservation interests, which have evidently had some success in reforming state laws. While this option holds some promise, there was a general view from respondents that unconventional gas regulation was often outside the purview of many big environmental groups (who tended to be focused on big ticket campaign issues, such as the Great Barrier Reef in Queensland or wildlife conservation in Colorado).

It is possible that new coalitions could be built (e.g. as with Lock the Gate in Australia) (Hutton 2012) to counter the influence of the gas industry. Environmental interests may also find alignment with renewable energy interests, which have already acquired a significant economic stake in some states (e.g. wind in Texas and Colorado, and solar in Queensland). Even so, it is clear that one cannot always assume there is an appropriate counterweight (eg. NGO) to industry influence in a democracy (Ayres and Braithwaite 1991, 444)

A more pragmatic set of options may be to encourage, and build support for, addressing specific weaknesses (see e.g. the recent propositions on setbacks in Colorado) and reforms designed to reduce some or all of the vulnerabilities raised above. Indeed, there are numerous steps that state governments could take to address most of these perceived vulnerabilities,

including introducing new transparency laws, restructuring departments to foster greater independence, introducing more stringent laws on movement of staff between government and regulated industries, and increasing funding for administrative agencies (Carpenter and Moss 2014).

Of course, one may be skeptical about how readily such changes would be delivered. Nonetheless, it has been argued that adapting, changing, and transforming existing dominant cultures, structures, and practices require new “niches”, governance experimentation and new relations that will ultimately destabilize existing regimes (Loorbach et al. 2017).

What, then, might be some of these experiments outside of existing state systems that may help to shine a light on more balanced and sustainable regulatory approach? At least three promising developments emerged from the findings. All point to ways in which relationships between industry, government and society might be reconfigured to pursue more sustainable solutions.

First, there has been growing interest in the unconventional gas space (including from our respondents) in targeting the industry’s social license (Whitton et al. 2018). As shown in other contexts, many companies are increasingly confronted by the fact that a legal license to cause harm may not prevent concern over their impacts on society. Pressure from NGOs, community groups and others can encourage companies to lift their game beyond minimum legal standards, often because of bad press, shareholders’ concern, or because of the (economic) benefits of being seen to be a good neighbor/corporate citizen (Hall et al. 2015).

Respondents reported mixed views on the effectiveness of pressuring gas companies and their social license. As some saw it, industry’s culture and environmental management approaches varied greatly, and not all would be prone to caring about their social impacts. Instead there was a view that attention should focus on larger, reputation-sensitive and leading companies (Parker 2002). Such companies were reportedly more open to community relations and environmental management, and had the economic means to lift their performance (e.g. pursuing deeper consultation processes with affected citizens, implementing innovative environmental management processes, or limiting their emissions) and in doing so, lever change across the industry.

Obviously, bringing social pressures to bear on companies risks ‘greenwashing’ and tokenistic responses. Even so, respondents suggested it offered a strategic way of achieving shorter-term gains, while engaging in longer-term battles to improve state regulatory systems.

A second, and related, option for new governance was the use of agreements between operators and affected local communities (perhaps represented by regional and local governments/municipalities (van der Heijden 2015). Historically, negotiated agreements have been between a regulator and regulated industry (see Hritier 2002), however in the unconventional gas space, there are examples of these types of contractual arrangements between industry and affected landholders and communities. In both states, there was a general view that agreements held some promise for addressing the impacts of industry on communities and the local environment (e.g. impacts on water). In Colorado for instance, some companies and municipalities had entered into Memorandums of Understanding that were praised by one community representative as being:

Much more nimble than trying to get a law passed for sure. And I think that there's a lot of value that comes out of them because they can be tailored for what that community would like to see protected...allow local governments to actually have a voice for constituents at the local government level to feel like that they're being heard.

This flexibility was seen to be an important way to go beyond minimum requirements of state regulation that respondents saw as inadequate or preventing desired approaches (i.e. local bans).

Notably, across the states it was clear that the success of such agreements depended on efforts to balance power between companies and affected landholders/communities, such as through independent negotiated information-sharing and resourcing. As one mediator described it:

where there's a combination of real leverage, real negotiating power, and also some skilfulness around creative problem-solving, those are the most successful outcomes...like setbacks or certain guarantees for things, whatever it is.

While there are debates about how binding and enforceable such agreements may be (Zilliox and Smith 2017), these approaches appeared to offer a more formalized and localized attempt at influencing social licenses, and leveraging change in the performance of the gas industry through tools outside of state regimes.

A third and final approach that emerged from the findings shares shades of democratic experimentalist scholarship (Bohman 2013). This places significant emphasis on monitoring and coordination of decentralized experiments in regulation, with a view to stronger accountability (through benchmarking), facilitating horizontal diffusion of best practice, and lifting of regulatory bottom lines. The regulation of unconventional gas would seem ripe for

such an approach, given the abundance of ‘state laboratories’. While this vision is sometimes seen as idealistic, there was at least one example in the US where a non-government body was beginning to implement this benchmarking approach. Known as STRONGER, this non-profit, multi-stakeholder, educational organization comprised equal representation from the oil and gas industry, state oil and gas environmental regulatory agencies, and the environmental public advocacy (see <https://www.strongerinc.org/state-reviews/>).

In an effort to deliver continuous improvement of state oil and gas environmental regulatory programs, the organization uses guidelines as a foundation for state reviews, bringing together different agencies to evaluate the overall program and identify things they’re doing well, and things that they could improve upon, against the criteria of the guidelines. Ultimately this alignment of different interests, information-sharing and some benchmarking against guidelines was claimed by one NGO to “help States in a lot of ways to tighten their regulations... going through this evaluation process you’re not real likely to kind of decide on a looser regulatory program or looser requirements”. Approaches like this (perhaps backed by a federal government or other organization) could help spread learning, ratcheting up performance of state regimes and potentially lessen vulnerabilities to industry influence. Ultimately, such multi-level and polycentric governance is more likely to “significantly affect the incentives that bring about mutually beneficial outcomes for the stakeholders involved” (Lozano-Maya 2016).

Conclusion

The expansion of unconventional gas extraction, like similar emerging global challenges associated with technology, e.g. health and security (Holley et al. 2020), is defined by rapid change, significant uncertainty and social contest. These features have made it difficult for regulators to keep track of and respond to these types of complex harmscapes, even though policies, regulation and institutional settings will often determine the success or failure of a contested, risk-bound technology. Through examining three leading global unconventional gas producers this chapter has focused on a significant factor that can hamper the success of regulating unconventional gas: the potential for industry influence and capture, and the implications for achieving sustainable energy regulation. The study found that respondents perceived the specific regulatory playing fields to be tilted in favor of the gas industry in all three states, at the expense of more socially and environmentally optimal outcomes. Perhaps such perceptions, in the face of rapid change and uncertainty, is not unexpected, given

increasingly palpable ideological “pessimism about the capacity of *any* governmental institution” to serve the “public interest.” (Novak 2013, 9). Even so, the chapter identified potential capture vulnerabilities and weaknesses that may challenge public servants and regulatory agencies, and hamper success in responding to the rapid growth of unconventional gas in the global energy mix.

In considering responses to these challenges we suggested governance pathways, which included the use of agreements and ordinances by local municipalities, influencing the social license of leading industries, and harnessing third parties to benchmark states and intensify regulatory performance.

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